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## **FORMATION AND MANAGEMENT OF THE ENTERPRISE'S IMAGE AS A FACTOR OF COMPETITIVENESS**

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**Abstract.** *The formation of the enterprise's image at each stage of enterprise development was studied and it was found out that this is a long and cost-effective process that requires consistency, but comparing costs and effects justifies actions. It was also determined that the formation of the enterprise's image occurs under the influence of external necessity, which arises in a competitive environment and is aimed at both external and internal target audiences. To enhance the influence of the emotional component of the image, the enterprise forms not only a positive image through the results of its activities, but also such external indicators as location, interior, appearance of personnel, management. Also, an important condition for creating a positive image is the establishment of public relations, mass media, and constant identification of the nature of perception of the company's image by various groups of the population when conducting sociological research. In the course of the research, tools for forming a positive image of the enterprise were identified, such as positioning, manipulation, mythologization, emotionalization and visualization. It was revealed that the image of an enterprise consists of the following structure: the image of the product, the image of the consumer of the product, the internal image of the enterprise, the image of the leader, the visual image of the enterprise, the social image of the enterprise. It was found out that after forming the image of an enterprise, it is necessary to manage it on the basis of periodic assessment of it. Therefore, image management can be carried out both at the level of a special public relations department and at the level of enterprise management. As for the periodic assessment of the enterprise's image, it can be carried out by full-time specialists who know the basics of improving the image or involve specialists from specialized agencies. During the study, qualitative models for assessing the image of an enterprise were identified, namely: a constructive model, a ranking method, focus groups that are focused on identifying deep and unconscious characteristics of people's consciousness and quantitative models (questionnaires, interviews). There are also methods for assessing the image of an enterprise using: semantic differential, scales, integral indicators, etc. They allow you to consider from different angles the effectiveness of image influence on the profitability of an organization and its economic indicators. There is also an analysis of secondary information to assess the image: content and intent analysis is the consideration of exactly those sources of information that the company uses to influence its contact audiences. The more widely an enterprise collects information from various informants, the more complete picture of its image in current market situation is created. And the formation of the image was studied on the example of ALC "Yagotynsky Butter Plant" and it was found out that this enterprise has a high competitiveness, since it produces high-quality products, helps the environment and society by holding various events and actions.*

**Keywords:** *image, image of the enterprise, competitiveness, image formation tools, image assessment, ALC "Yagotynsky Butter Plant".*

**JEL classification:** B21, B22, C1, D2, D6, D7, E6.

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### **1. Introduction**

The growth of international trade and increased competition in both foreign and domestic markets are caused by innovative processes in the economy, science, education, and culture. That is why the specifics of forming and managing the image of enterprises as a factor of competitiveness of an economic entity are of particular interest. A positive image is perceived as an important and necessary component of the intangible assets of prosperous enterprises. Since a positive image increases the competitiveness of enterprises, facilitating access to resources (financial, informational, human, material), promotes the establishment of strong partnerships, increases consumer loyalty to

manufactured products and positions them as a corporate and socially responsible element of business. Also, a strong competitive position due to the positive image of the enterprise strengthens the "market power", and the resistance of various contact groups to the enterprise in the market is reduced.

The recent attention paid by companies to creating their image indicates that business in Ukraine is on the path of long-term effective development based on socially responsible behavior. Despite the significant scientific achievements of scientists, a number of issues related to the latest technologies for forming and managing the image of enterprises require further improvement, which determines the relevance of the research.

## **2. The current degree of study of the problem and the purpose of the study**

The study of the formation of the image of the enterprise is carried out by such foreign scientists as: Aaker D. [1], Berdyskykh M. [2], Zveryntsev A. [3] and domestic: Korolko V. [4], Kuzmin O. [5], Ksondz S. [6], Lozovskyi O. [7], Tsymbalyuk S. [11], Stefanych, D. [12]. etc. Analysis of recent scientific research in the field of competitiveness management shows that most scientists do not study the issues of forming the image of an enterprise in functional markets as an element of corporate social responsibility of business. Therefore, the purpose of the study is to substantiate ways to improve the process of forming and managing the image of an enterprise in functional markets.

## **3. Applied methods and materials**

At different stages of the study general scientific and special methods were used: theoretical generalization and scientific abstraction – to determine and clarify the essence of the main categories and concepts of the enterprise's image; analogies and comparisons – to compare various phenomena, processes, trends regarding their impact on the image of enterprises; statistical and economic (studying the influence of internal and external factors on the formation of a positive image in the enterprise competitiveness management system); dialectical and abstract-logical – when conducting theoretical generalizations, clarifying the conceptual apparatus on the research problem and formulating conclusions; analysis method – when assessing the image of ALC "Yagotynsky Butter Plant".

## **4. Obtained results and discussion**

Any company that intends to have a strong market position and competitiveness must have an individual identity that is different from the competition. A company's identity consists of its behavior, image, and communication. These elements form the image of the enterprise or its perception by customers, partners, and investors. Building a positive company image cannot be based solely on visualization and a unified logo, graphics, letter designation, color, or interior design style. Other factors are also even more important in the process of developing the company's image. Focusing only on the company's image leads to the phenomenon of building a facade - no matter how beautiful it is, there is nothing behind it.

Let's start from the beginning. Each enterprise in the process of its existence goes through four key stages [5]: the first stage: the formation of the enterprise, focusing on a certain market segment; the second stage: approval of the enterprise in the achieved positions and relatively stable activity; the third stage: characterized by active innovation activity of the enterprise, pursuing the goal of expanding the market with a stable and strong position in its positions (the apogee of the enterprise for the entire period of its existence - the "Golden Age"); the fourth stage: transformation of the enterprise, which can lead to its decline (bankruptcy, stagnation), or to the next innovation turnover.

At the first stage, when the enterprise is at the stage of formation, the cost of forming its image and the total cost of advertising are relatively insignificant. The external image at this stage, due to the minimal advertising costs, requires the following actions:

- sending informational letters to clients and potential partners about the creation of the enterprise, its goals and overall strategy;
- outdoor advertising focuses on the exclusivity of the services or goods offered by the enterprise, which determines the future niche of the enterprise in the market. The trademark is presented unobtrusively at this stage.

At the second stage, the enterprise took over a certain niche of the market, and strengthened its position in it. At this stage, the enterprise increases the cost of both image advertising and general advertising as a whole. The external image of the enterprise at this time is focused on such events as:

- regular support of communication with potential customers - pre-holiday mailings, notifications about innovations in their activities, etc.;
- advertising of enterprise technologies in advertising publications;
- dynamic use of the enterprise's trademark, logo, and slogan in all types of its image activities;
- the enterprise's entry into public relations - sales for charity, presentations, open days, etc.

The third stage is the "Golden Age" of the enterprise. The external image of the enterprise at this stage provides for:

- reduce the cost of general advertising, as the company's trademark already makes itself felt;
- start of organizing advertising for innovative projects of the enterprise;
- taking an active part in public events, where the level and focus should correspond to the style and image of the enterprise;
- deployment of social advertising, charity, etc.

At the fourth stage, if the enterprise is innovative, then the entire cyclical process is started anew, but easier, since there is already experience of previous traditions.

So, as it turned out, building a generally accepted image is a long and expensive process that requires consistency, but comparing costs and effects justifies action. Considering the features of forming the image of an enterprise in modern socio-economic and socio-cultural conditions, we can draw the following conclusion [1]:

1. The image of an enterprise is formed under the influence of external necessity, which arises in the context of the struggle for its preservation and development.

2. The enterprise's image is aimed at both external and internal (staff, management, shareholders, members of the board of directors) target audiences. Therefore, there is an internal need to create a positive image of the organization both among its employees and among social groups that use the company's product.

3. The image of an enterprise is formed in the process of interaction of the image of its personnel with that which arises from external entities interacting with it. Therefore, it is necessary to study and meet the needs of social groups, individuals who are aimed at creating a certain image of the enterprise.

4. To enhance the influence of the emotional component of the image, the enterprise forms not only a positive image through the results of its activities, but also such external indicators as location, interior, appearance of personnel, management.

5. The formation of an enterprise's image is subordinated to solving both long-term and current tasks of its economic, cultural, and social activities. Therefore, an important condition for creating a positive image is to establish relations with the public, mass media, and constantly identify the nature of perception of the enterprise's image by various groups of the population when conducting sociological research.

Therefore, let us take a closer look at public relations - this is the establishment of relations between an organization and various contact audiences by creating a favorable reputation for the company, a positive image that will ensure the elimination or prevention of unwanted gossip, rumors and actions. These directed actions provide an atmosphere of mutual trust and understanding between the company and society [4].

Now let us go directly to the tools for creating a positive image of the enterprise. Tools such as positioning, manipulation, mythologization, emotionalization, and visualization are used to create an image [11].

Positioning is the placement of an organization in a market environment, taking a position that will differ from the positions of competitors. Manipulation is the transfer of attention from the main object to another, for example, to any person who is later associated with the main character. Mythologization is the creation of a myth that the target audience of the enterprise subconsciously

wants to believe and which is not subject to verification, since it is confirmed by the generally accepted "everyone knows about it", "everyone thinks so", "everyone knows it" and so on. Emotionalization is the presentation of interesting, various information that will both encourage and be better remembered. Visualization - creating visual elements of the image: logos, trademarks, colors, packaging shapes, and so on.

Of course, the formation and establishment of a positive image of the company requires certain costs, in particular, high standards of product quality, business cards of employees, branded clothing, charity and participation in public life. If you form long-term goals of the enterprise related to the image, and then determine the main types of work that need to be performed to achieve these goals, then you can quite accurately determine the monetary costs necessary to create the image of the enterprise.

It is important in creating an image not only to offer information for introduction to the perceiving audience, which together creates the image of the enterprise, but also to create models of its positive perception and evaluation.

It was revealed that the image of an enterprise consists of the following structure: the image of the product, the image of the consumer of the product, the internal image of the enterprise, the image of the leader, the visual image of the enterprise, the social image of the enterprise (see figure 1).

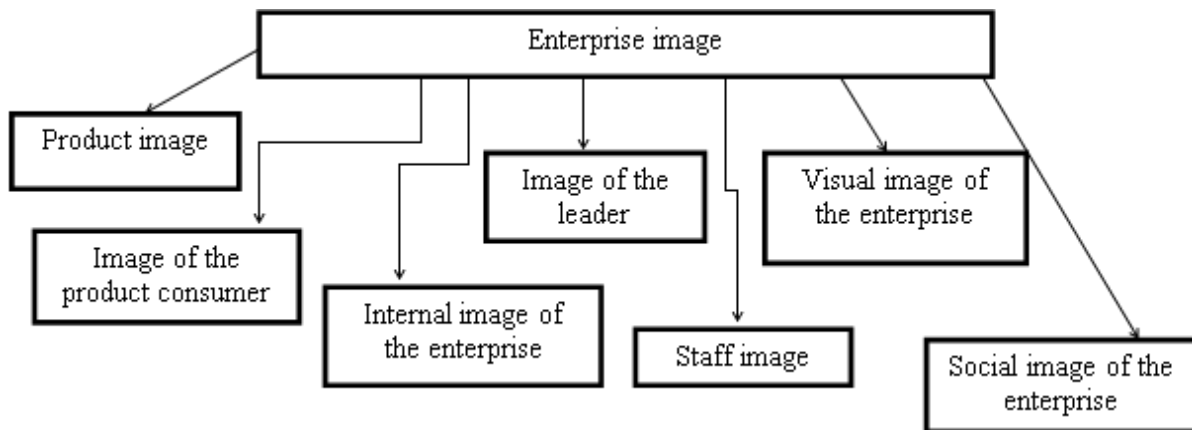


Figure 1. Enterprise image structure

Source: formed by the author on the basis of [7].

1. Product image – these are unique characteristics that describe this product. Creating a positive image requires significant advertising costs. The following components form the product image: functional values of the product - the main benefit or service that the product provides; additional attributes - what ensures the uniqueness of the product (design, name, packaging, quality, etc.).

2. The image of the consumer of goods is formed on the basis of lifestyle (interests and views of a person, actual needs; activity of the person, characteristic behavior and manner of spending time; individual personal values), the character of consumers (a set of stable psychological traits that affect the behavior of this person) and social status.

3. The internal image of the enterprise is the imagination of employees about their enterprise, indicators are the socio-economic climate, as well as the culture of the organization.

4. The image of the head of the enterprise or the founders of the company is the motives, intentions, value orientations and psychological characteristics of the founders based on the perception of such characteristics as:

- feature of behavior, i.e. facial expressions, smiles, gestures, eye contact, speech characterized by timbre, pronunciation and tone;
- socio-demographic affiliation (age, gender, level of education, housing, income, etc);
- appearance, this factor is the most open to observation characteristics of a person who does not need much time to identify himself;
- behavior of a person in a certain situation;



- parameters of non-main activity, they are formed by the stages of professional career, interests, family environment, thoughts, activity of a person in his free time (hobbies, sports, entertainment, the manner of spending his vacation, etc.).

5. The image of personnel is a generalized image of employees that reveals the most characteristic features for them. Competence, professionalism - the degree of preparation of a person for various types of activities or knowledge and possession of a wide range of skills, communication skills and experience, mobility (quality of service), neatness and accuracy in performing duties; staff culture; visual image.

6. Visual image of the enterprise - picture of the company, which is formed on the basis of information about the exterior and interior of the office, exhibition and sales halls, corporate symbols and the appearance of staff.

7. The social image of an enterprise is the imagination of a wide range of consumers about the role of the company in the cultural, economic, and social life of society. This image is formed through support of social movements, sponsorship, patronage, participation in solving environmental, medical, and employment problems.

After forming the image of an enterprise, you need to manage it on the basis of periodic evaluation of it, because over time it becomes irrelevant or worsens under the influence of various factors. We must not forget that competitors also do not stand still, but try in every possible way to attract customers in order to get ahead. To do this, they improve their image, hold promotions or events. Therefore, modern methods of assessing the image of a business entity allow us to identify problems and find ways to eliminate them. If these methods are not available, you need to develop methods for maintaining a favorable image, as well as ways to attract customers or investors.

Therefore, image management can be carried out both at the level of a special public relations department and at the level of enterprise management. Enterprise image management at the level of the public relations division consists of the following stages [3]:

1. study of the existing image management system of the enterprise;
2. identification of the main elements of the image management system that correspond to the current level of development of the enterprise, its goals, objectives, and even the prospects of the external environment;
3. adjusting the "lifestyle" of the enterprise;
4. choosing a way to inform target groups about the specifics of the enterprise;
5. formation of the enterprise's image management system.

Enterprise image management at the enterprise management level includes the following stages:

1. research of the existing system of internal and external image management of the enterprise, distribution of areas of responsibility in the field of image management by the management ladder;
2. identification of the most important elements of the image management system that correspond to the level of development of the enterprise, its goals, objectives, and prospects of the external environment;
3. implementation of the enterprise image management system.

At the same time, the head of the enterprise must coordinate the efforts of all divisions of his enterprise and coordinate their activities with external communication in order to form a positive image.

As for the periodic assessment of the enterprise's image, it can be carried out by full-time specialists who know the basics of improving the image or can be involved specialists from specialized agencies. A qualitative approach to determining and evaluating a business image includes [10]: managerial introspection, interviewing representatives of the corporate audience, the method of sociological surveys, the expert method, and focus groups. High-quality models are most often used: focus groups, individual in-depth interviews, including project methods. Their main purpose is to

determine the verbalization of images, feelings and emotions, the symbolic series, the relationship between logical and emotional. Table 1 clearly shows qualitative models for assessing the image of the enterprise, which are focused on identifying deep and unconscious characteristics of people's consciousness..

Table 1. Qualitative models for evaluating the enterprise's image

| Model name     | The essence of the model   |
|----------------|--|
| Design model   | Respondents are asked to create something, describe it, show drawings, and so on. The data is recorded, and then subjected to a comprehensive analysis to identify the attitude of people to the image of the enterprise.  |
| Ranking method | They distribute the characteristics of products or services that are presented in the form of a test. They ask you to choose the ones they think are necessary. Although ranking refers to project methods, it is a type of quantitative assessment methods.                 |
| Focus groups   | Such groups are an innovation in assessing the enterprise's image. Each group has a moderator or PR manager. Participants talk to each other, express opinions or ideas. During conversations, you can get valuable information about the enterprise's image or competitors. |

*Source: formed by the author on the basis of [10].*

Next, we should consider what applies to quantitative models. Quantitative models include questionnaires and interviews. The survey allows you to collect static information about the state of the image, find out the opinion of society, its attitude to the organization. You can also use it to evaluate the effectiveness of advertising and promotions. Interviewing is a deep method of assessing the image of an enterprise, which makes it possible to find out people's opinions at the micro level, to understand how a person feels when using goods or services [6].

A comprehensive analysis allows you to get a complete image of the organization, so you need to study not only the external, but also the internal image. Assessment of the internal image of the enterprise will allow you to find out the leader's image and management style; psychological climate of the organization; corporate culture. When studying, it should be remembered that the image is a multi-faceted and complex phenomenon.

There are also methods for evaluating the image of an enterprise using: semantic differential, scales, integral indicators, etc. They allow you to consider from different angles the effectiveness of the image impact on the profitability of an organization and its economic indicators. Below, in table 2 these methods are listed.

Table 2 shows that most authors adhere to the evaluation method using integral indicators. So let us look at the advantages and disadvantages of this method.

***Advantages:***

- contains universal methods for assessing the image of an enterprise in any field of activity, the size of the enterprise, and the stage of its life cycle;
- assessment of the enterprise's image separately for each of its interaction groups;
- assessment of the enterprise's image is carried out through the assessment of its elements, which are ranked by their significance, which significantly increases the objectivity of the assessment;
- based on the results of the assessment, a conclusion is made about which specific areas of activity of the enterprise need to be improved.

***Disadvantages:***

- the contribution of individual image-forming factors to the formation of a positive image for a particular target group and the degree of consistency of respondents' opinions are not taken into account;
- complex mathematical calculations;

- generalization of image-forming factors leads to the fact that the assessment of the company's image is not carried out for all structural elements, which in turn does not allow them to be managed.

**Table 2. Methods for evaluating the enterprise's image**

| Method name  | The essence of the method  | Authors who adhere to this method   |
|--|--|---|
| Evaluation method using semantic differential        | The evaluation algorithm includes:<br>1) development of a set of relevant criteria;<br>2) applying the scale to a specific sample of respondents;<br>3) output of the average result;<br>4) checking image variability;<br>5) visualization of evaluation results.   | Kotler F.,<br>Dagaeva E.,<br>Muromkyna I. I.,<br>Matyushyna T. V.   |
| Evaluation method using scales                       | The first stage is an assessment of the target audience's level of knowledge about the subject, which is usually carried out using the following awareness scale: never heard, heard occasionally, a little familiar, know more or less, know very well. If the majority of respondents fall into first or second category, companies should pay special attention to raising the audience's awareness of their activities. Then, using the following attachment scale, it should be examined the attitude to the company's products of respondents who know products well: sharply negative; rather negative; indifferent; rather positive / very positive. If the majority of respondents have a negative attitude to the company's products, it is logical to conclude that the organization needs to overcome the problem of negative image. In order to understand the company's problems better, a combination of both scales is practiced | Zakharov V. Y.,<br>Shkardun V. D.,<br>Akhtyamov T. M.,<br>Moskvina I. A.,<br>Rogalova N. L.   |
| Evaluation method by calculating integral indicators | This method includes the following steps:<br>1) identification of factors for which the assessment will be carried out;<br>2) determining the relative importance of each of the factors. To do this based on a survey of consumers or experts factors are assigned a certain coefficient of weights (weight);<br>3) development of a qualitative and quantitative scale for evaluation by all factors;<br>4) determination of the average rating for each factor in accordance with the developed rating scale based on the results of a consumer survey.   | Matyushyna T. V.,<br>Sinyayava N. M.,<br>Tomilova M. V.,<br>Rogalova N. L.,<br>Brezhneva V. M.,<br>Gerasymova T. V.,<br>Yakubenko E. N.,<br>Chubukova L. V. |

*Source: formed by the author based on [2; 3; 6; 12].*

There is also an analysis of secondary information. It, as a method of evaluating the image of an enterprise, has special application conditions. For this purpose, it will be relevant to consider exactly those sources of information that the enterprise uses to influence its contact audiences (figure 2).

A special feature of content analysis is that it examines documents in their social context. When evaluating an enterprise's image, the method can be used to analyze interview data and open-ended questions in questionnaires.

In intent analysis, the concept of intent is understood as intentions, goals, and the orientation of consciousness to a particular subject that they are trying to convey to the audience.

These methods are not used for direct assessment of the enterprise's image, but their use provides information that is necessary in the image management process, namely:

- analysis of information in the media about competitors;
- vision of general social attitudes;
- determining the target audience's preferences;
- forecast of future demand and possible changes.

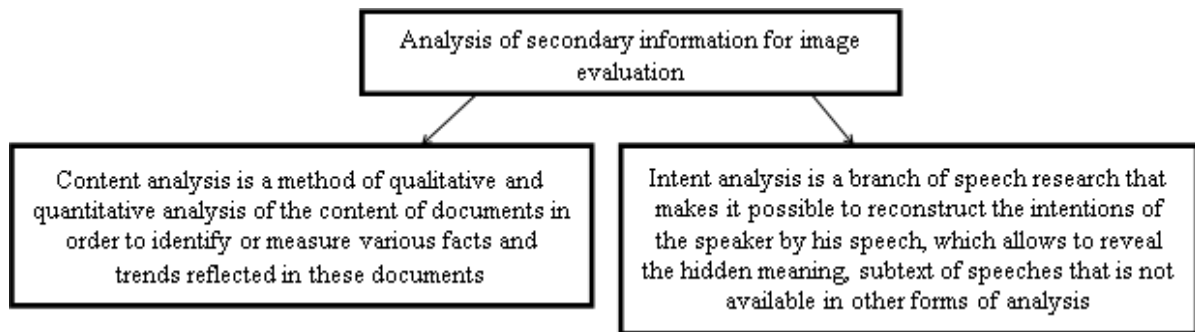


Figure 2. Content and intent analysis of the enterprise's image

Source: formed by the author on the basis of [12].

All these research methods can also be used in relation to the political image and external image of the enterprise. The more widely an enterprise collects information from various informants, the more complete picture of its image in current market situation is created.

Next, we will consider the formation of the image on the example of ALC "Yagotynsky Butter Plant", which is part of JSC "Milk Alliance" (ALC "Bashtanka cheese plant"; ALC "Zolotonosha Butter-Making Combine", LLC "Pyriatyn Cheese Plant"; ALC "Yagotynsky Butter Plant"; ALC "Yagotynsky Butter Plant" "Yagotynske for Children") - its market share in 2019 was 9.6%. The company's product portfolio is balanced in such a way as to meet the needs of a wide range of consumers in various product categories of the dairy and cheese markets. The main competitors of this JSC in 2019 in Ukraine (their market share) are: JSC "Wimm-Bill-Dann Ukraine" - 4.4%; PJSC "Danone" - 4.9%; PJSC "Combine Pridneprovsky" - 2.6%; LLC "Milk Company Galychyna" - 2.7; LLC "Loostdorf" - 5.2%; PJSC "Ternopil Milk Plant" - 2.6%; LLC "Terra Food" - 9.2 and others – 58.8%. In general, the Ukrainian dairy market is considered highly competitive - the number of only large players is about 10-15, not to mention numerous small local producers, the number of which exceeds several hundred.

Today ALC "Yagotynsky Butter Plant" is no longer a provincial factory of regional significance, which persistently lends to farmers in order to survive. This is a fairly self-sufficient and powerful enterprise, which employs about 800 people. Producing a wide range of dairy products, the plant is the largest enterprise with the most modern production.

Let us recall that the company under study has more than one award, which is one of the factors that contributes to the formation of a positive image. It should be noted such awards [8; 9]:

1. Winner of National competition of products and services quality "Top 100 Ukrainian Products" for pasteurized drinking milk "Big milk" 3.2% fat, 2014.
2. Golden medal of National tasting competition of dairy products quality by National association of dairy producers in Ukraine "Ukrmolprom" and diploma for dairy butter "Extra" 82.5% fat TM "Yagotynske", 2014
3. Golden medal of National tasting competition of dairy products quality by National association of dairy producers in Ukraine "Ukrmolprom" and diploma for pasteurized cow's drinking milk "Velyke" 3.2% fat TM "Yagotynske", 2014.
4. Golden medal of National tasting competition of dairy products quality by National association of dairy producers in Ukraine "Ukrmolprom" and diploma for Ryazhenka from the oven 4% fat TM "Yagotynske", 2014.
5. Golden medal of National tasting competition of dairy products quality by National association of dairy producers in Ukraine "Ukrmolprom" and diploma for the fermented milk "Zakvaska" with vanilla-flavored pear filling 2.5% fat TM "Yagotynske", 2014.
6. Winner of National competition of products and services quality "Top 100 Ukrainian Products" for the fermented milk "Gerolact", 3.2% fat, 2015.
7. Gran Prix of National tasting competition of dairy products quality by National association of dairy producers in Ukraine "Ukrmolprom" and diploma for the fermented milk "Gerolakt", 3.2% fat, 2015.

8. Golden medal of National tasting competition of dairy products quality by National association of dairy producers in Ukraine "Ukrmolprom" and diploma for dairy butter "Extra" 82.5% fat TM "Yagotynske", 2015.
9. Golden medal of National tasting competition of dairy products quality by National association of dairy producers in Ukraine "Ukrmolprom" and diploma for the pasteurized milk drink with cocoa "Cocoa Milk" 3.2% fat TM "Yagotynske", 2015.
10. Silver medal of National tasting competition of dairy products quality by National association of dairy producers in Ukraine "Ukrmolprom" and diploma for dairy butter "Selianske" 73% fat TM "Yagotynske", 2015.

The positive image of ALC "Yagotynsky Butter Plant" is formed not only by the product of this enterprise, which inspires trust due to the quality and long-term status of "the best milk product", behind this is the latest equipment, competent employees and efficient management. ALC "Yagotynsky Butter Plant" also purchased new sewage treatment plants worth 30 million UAH, which was established at the end of 2020, which positively affected the formation of the enterprise's image, since the enterprise cares about the environment.

Next, we will consider the activities of ALC "Yagotynsky Butter Plant", which form a positive social image of the enterprise under study (see table 3)

Table 3. Activity of ALC "Yagotynsky Butter Plant" in society

| Event   | Year       | Event description   |
|---|------------|---|
| 1. Promotion with the participation of milk "Velyke" 2.6% fat, to help children with cancer | 2018, 2019 | From each package of milk "Velyke" sold during the promotion period, 10 kopecks were transferred to the account of the charity foundation "Tabletochki".  |
| 2. Campaign "Return of milk to Ukrainian schools"   | 2020       | ALC "Yagotynsky Butter Plant" for three months in 2020 provided milk 2.6% fat TM "Yagotynske" Secondary School No. 1. in Yagotyn  |
| 3. Campaign "Updating the library in orphanages" and "Feeder - bird helper"                 | 2020       | Each orphanage received a creative set for creating bird feeders. Children placed a hand-made feeder in the park areas of their localities. Thanks to this, it was possible to unite 1,500 children from different parts of our country, and for this 30 orphanages received brand-new books, which were selected depending on the age category of children.  |
| 4. Financial assistance to the ATO  | 2015-2020  | ALC "Yagotynsky Butter Plant" continues to provide financial assistance to the ATO.   |
| 5. Financial assistance to hospitals during the COVID-19 pandemic.                          | 2020       | ALC "Yagotynsky Butter Plant" provided financial sponsorship to the local hospital in the amount of 40,000 UAH. They were transferred to MNPE "Yagotynska Central Regional Hospital" for the purchase of a ventilator, as well as 10 000 UAH to the MNPE "Yagotynsky Center of Primary Health Care" for the purchase of necessary medical products and personal protective equipment and disinfectants. |

*Source: compiled by the authors on the basis of [8; 9].*

The campaign "More than milk" was held throughout Ukraine from October 1 to December 31, 2019. During the promotion period from each sold package of milk "Velyke" 2.6% fat, 10 kopecks were transferred to the account of the charity foundation "Tabletochki". The collected amount, namely 164,289 UAH, was used to purchase vital medicines and medical supplies for the wards of the charity foundation "Tabletochki", who are being treated in the Department of Pediatric Hematology of the Kyiv Regional Oncology Dispensary.

It should be recalled that this is the second joint charity project of TM "Yagotynske" and charity foundation "Tabletochki". In 2018, as a result of the charity event, it was possible to collect 138 000 UAN, which were used to purchase medicines and medicines for children who were treated in cancer centers in Kyiv, Mykolaiv, Cherkasy and Poltava regions.



Also fact that TM "Yagotynske" supported the project for returning milk to Ukrainian schools creates a positive image for the enterprise. ALC "Yagotynsky Butter Plant" in 2020 provided free milk 2.6% fat TM "Yagotynske" Secondary School No. 1. in Yagotyń. This happened as part of a pilot project of healthy nutrition in Ukrainian schools, which was introduced at the initiative of the wife of the President of Ukraine Olena Zelenska. Moreover, the goal of this project fully coincides with one of the philosophical priorities of JSC "Milk Alliance", namely: care for the health of the nation. Similar programs for daily provision of milk to children in educational institutions operate in more than 80 countries around the world.

In addition, TM "Yagotynske" helps orphanages to update libraries. As part of the social campaign "Feeder - bird helper" milk packaging "Velyke" TM "Yagotynske" 2.6% in winter period from January 28 to February 28, 2020 changes the design that helps consumers quickly design bird feeders using already applied markings. This is aimed to ensure consumers to help birds survive the winter. Thus, this promotion helps, firstly, to educate children to take care of living creatures - birds; secondly, it helps orphanages create or update their existing own libraries. 30 orphanages from 7 regions of Ukraine took part in this campaign: Kyiv, Sumy, Chernihiv, Cherkasy, Vinnytsia, Kirovohrad and Dnipropetrovsk region. Thus, around the social campaign, the "Yagotynske" trademark managed to unite 1,500 children from different parts of our country, and 30 orphanages received new books that were selected depending on the age category of children (3-5 years, 6-10 years and 11-18 years).

Also, of course, there is respect for the fact that even now, in difficult times in 2020, ALC "Yagotynsky Butter Plant" continues to provide financial assistance to the participants of the ATO.

As for 2020, it is worth saying that even during the COVID-19 pandemic, the selected enterprise makes a lot of efforts that directly positively affect the image of the business entity. Since ALC "Yagotynsky Butter Plant" provided financial sponsorship to the local hospital in the amount of 40,000 UAH. They were transferred to MNPE "Yagotynska Central Regional Hospital" for the purchase of a ventilator, as well as 10 000 UAH to the MNPE "Yagotynsky Center of Primary Health Care" for the purchase of necessary medical products and personal protective equipment and disinfectants. The enterprise provided disinfectants, chlorine and detergents to medical institutions in assistance [8; 9].

So, we can say that the enterprise under study has a successful reputation and a positive image of the enterprise as a whole. ALC "Yagotynsky Butter Plant" has been producing high-quality products for more than one decade, takes care of the environment, has a clear social position, competent staff and qualified management.

## **5. Conclusions**

Therefore, as we were able to find out, an image is a certain vision that is formed when observing a certain object. As for the image of the enterprise, it is a stable idea, a set of associations and impressions about the organization that are formed in the minds of customers and determine their position in the market and competitiveness. Several components forms the image of the enterprise: the image of the product; the image of the consumer of the product; the image of the leader; the visual image of the enterprise; the internal image of the enterprise; the social image of the enterprise. The enterprise's image should be improved continuously. Since a strong and positive image becomes a necessary condition for an organization to achieve sustainable and long-term business success. Because, first, a strong image of the enterprise gives the effect of acquiring a certain market power by the enterprise, in the sense that it leads to a decrease in price sensitivity. Secondly, a strong image reduces the interchangeability of goods, which means that it protects the organization from attacks by competitors, and also strengthens its position in relation to substitute goods. And, third, a positive image facilitates the company's access to various types of resources: human, financial, informational, and so on. Therefore, the image of an enterprise should be constantly evaluated using various methods, namely qualitative, quantitative, scales and an integral indicator, as well as a semantic differential. Questionnaires and interviews, content and intent analysis are also very effective in assessing the image of an enterprise.

After analyzing the image of ALC "Yagotynsky Butter Plant", we can see that the enterprise under study does everything to maintain its competitiveness, increase its positive image through its

positive reputation by producing high-quality products, but also to help the environment and society by holding various events and promotions.

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## **DUE DILIGENCE AS A TOOL OF ENTREPRENEURSHIP RISK**

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**Abstract:** *The present stage of market relations development is characterized by the increase of business activity of business entities through the attraction of foreign investments, the opening of branches, increase of efficiency of use of resources. This contributes to the increase of employment of the population, an increase of production volumes and its realization, additional sources of financing of activity of economic entities appear. However, such trends increase legal and financial risks: loss of investor assets, weakening of competitiveness, loss of business attractiveness, loss of market share. One way to minimize business risks is to use the Due Diligence procedure.*

**Keywords:** *Due Diligence, verification, representative result, the value of the activity, investments.*

**JEL Classification:** M41, C13, D81

**UDC:** 657.6.012.16

### **1. Introduction**

The two English words «Due Diligence», include the procedure of checking the state of business, its specific parties or a fact by analyzing the relevant documents. Due Diligence has become necessary for exploration of all aspects of the target company, such as the finances, the manufacturing, the legality of operations, information security, human resources, to see if the initial impressions of this company were accurate, to decide whether to continue the acquisition process and at what cost. The application of the tool helps to evaluate how the acquisition will affect the efficiency of internal business processes and create new opportunities, providing the opportunity to promote the strategic goals of the company and increase its value for shareholders. The procedure can be a global nature when specialists study the financial side of an entity, its activities, reporting and compliance with the statutes, certificates agreed to base legislation, and many others. During the examination, financiers, appraisers, lawyers, technical consultants, engineers, and security specialists work. But more often the valuation is needed only for something alone, such as real estate documents when buying or selling it, then they are completely dispensed with by a professional lawyer.

Due Diligence plays a big role in management companies, allowing to execute, reduce or minimize negative consequences. Its use makes it possible to accurately and timely identify threats to the entity's activities and make appropriate decisions within the risk management policies that it has developed. This process makes it possible to establish a trusting relationship between the buyer and seller of a business or asset.

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

Both foreign and domestic scientists have devoted their attention to the study of entrepreneurial risk assessment tools: J. Bower, R. Waterman, R. Kaplan, D. Norton, I. Blank, D. Ryabikh, A. Nicevich, I. Koltsova, A. Peresada, O. Vovchak, A. Skorobogatov, T. Mayorov and other researchers. Discussion questions regarding the application of Due Diligence caused the choice of the topic of scientific work, its purpose, tasks, methods and directions of research.

### **3. Setting objectives**

The purpose of the research is to study Due Diligence as a means of making informed decisions, as a mechanism for ensuring the successful development of business entities, as a tool for identifying risks when investing projects, as a procedure to verify the legal status of the business.

### **4. Obtained results and discussion**

At the beginning of the XX century. the concept of «Due Diligence» was introduced and was used for legal purposes. At that time, the term meant the procedure by which a broker discloses information to an investor about an entity whose shares are traded on a stock exchange. Due Diligence has changed somewhat today. The tool is now used to collect and analyze information to assess the various risks involved in investing procedures [1].

Due Diligence is a mechanism that ensures the independent collection of objective information and the expert evaluation of the assets of the business being sold. The procedure allows the customer to obtain a reasoned answer in a short time about the expediency of financial investments in the object of investment (verification of the legality and commercial attractiveness of the planned agreement or investment project) [2].

Due Diligence also applies to the merger or acquisition of an entity, the purchase of valuable assets. It is needed in any situation where a professional's independent opinion is needed regarding a future agreement, whether investing, lending or even sponsoring a startup project. In addition, Due Diligence is a way to assure the customer that his or her potential partners are legitimate.

There are several situations in which companies need Due Diligence:

- equity participation of the new owner in the company;
- change of leadership;
- receiving sponsorship;
- loss of intellectual property;
- reduction of competitive positions;
- reducing the efficiency of the enterprise;
- litigation, seizure of the assets of the firm;
- detection of violations during the tax audit;
- labor disputes.

The tool can help you identify ways to improve the legal and financial standing of an entity. Due Diligence is one of the stages of the acquisition of assets, as it helps the investor to form an idea of the product of sale, the possible risks at the time of property appropriation, and the crisis situations that may arise after the conclusion of the transaction. The tool is based on the analytical evaluation of information on changes in the external and internal environment of the enterprise by checking all components of the business, in particular: legal, financial, accounting, tax, marketing, information, management, environmental, technical, operational nature.

Due Diligence often involves the following specialists:

- lawyer (responsible for conducting legal and legal expertise of the organization's activities to identify potential risks for the investor associated with its acquisition);
- financial analyst (his work includes the determination of the present value of the investment object and its possible range of value in different options for the use of the asset in the future);
- the auditor (his competence includes the financial audit of the company's activity over several reporting periods, as well as identification of tax risks and possible ways to optimize the tax base).

They are mandatory participants in the holding process, however, other experts may be invited to join the working group. The team must include financial, accounting and legal staff, but it can also include economists, engineers, environmental experts and other professionals. Successful Due Diligence depends on the clear and consistent work of appraisers, auditors and lawyers, as well as on the timely submission of reliable information by the seller [3].

Some businesses, due to their savings, do Due Diligence on their own. Specialists from the relevant units are involved in this purpose. The application of this approach at the enterprise has both advantages and disadvantages.

The advantages of refusing to hire specialists are:

- reducing the cost of the procedure;
- having in-house specialists of deep professional knowledge in the field of activity of their enterprise;
- an opportunity to evaluate your own business from the inside out and more accurately formulate possible risks and recommendations for their elimination.

The disadvantages of refusing to hire external experts are:

- diversion of employees from operational tasks;
- Due Diligence on its own only when acquiring a business in a similar field of activity;
- the risk of bias.

Thus, due diligence is advisable to be conducted in small enterprises, because comprehensive analysis of big business requires not only highly qualified specialists but also high research costs.

There are cases when evaluation companies are involved in the procedure, providing the customer with turnkey research results. Another option is to involve professionals from various law and audit firms specializing in Due Diligence services. The disadvantage of this approach is that it takes a lot of time to search, invite and agree on the terms of inspection with the experts of different companies, and the cost is higher than when ordering a turnkey study since the working group includes financiers, appraisers, lawyers, technical consultants, engineers, security specialists, whose services are paid for separately [4].

Every business faces risks that can threaten its success, so processes, methods and tools must be applied to manage them. The following risks should be taken into account when conducting business activities: strategic risk, for example, when a competitor enters the market; the risk of compliance with the new legislation on occupational safety and health; financial risk, for example, when a customer fails to pay on time or increases interest payments on a business loan; operational risk (breakage or theft of equipment); environmental risks, including natural disasters; employee risk management; political and economic instability in any foreign markets to which the sales product is exported; risks to the health and safety of the personnel of the enterprise [5].

Enterprise risk management is possible subject to effective internal audit. The internal audit task of a risk management system is to provide reasonable assurance to owners and managers that the risk prevention strategy they have developed is tailored to the operating characteristics of the enterprise and is effective.

Internal audit is a functional controlling entity of the entity that reports to the owner and works to evaluate the effectiveness of the enterprise management system and the control system. Its purpose is to protect the interests of the owners in maintaining and efficient use of the resources of the enterprise, as well as to obtain reliable and complete information for making sound management decisions. Internal auditors provide the management of the entity with analysis and evaluation data, recommendations and other relevant information as a result of the audits. According to the results of the control, the previously made decisions, plans, norms and norms are adjusted. Effective control is strategic, goal-oriented, timely and simple enough. In the general management system, control acts as a feedback element [6]. Effective interaction of internal audit and use of Due Diligence tool reduces business risk and even avoids financial costs in case of unforeseen situations that will damage the business entity. Consider the approach to implementing the Due Diligence procedure and how internal audit works (Figure 1).

To reduce the entrepreneurial risk of Due Diligence goes through the following steps:

1. general information about the object of expertise is collected, meetings with the management of the enterprise are held, preliminary business plans, strategies, documentation are evaluated, hypotheses are made regarding the directions of further analysis of the enterprise;
2. conduct external interviews with experts, clients and sales channel representatives, contractors and partners, analyze customer needs; performs an overall assessment of the market that is within the



business focus of the company and forecasts its development in the short term, as well as provides advice on choosing a promising business model that meets the current market challenges;

3. interviews with clients using competitors' products and services are conducted, contacts with competing companies are conducted under the guise of a client, the degree of quality of customer service is evaluated, the amount of time between contacts and an offer that competitors can provide is determined;

4. an internal analysis of the company is conducted, the adequacy of the existing resources of the company is substantiated to ensure full compliance with the strategy and the ability to execute the set plan for the specified period;

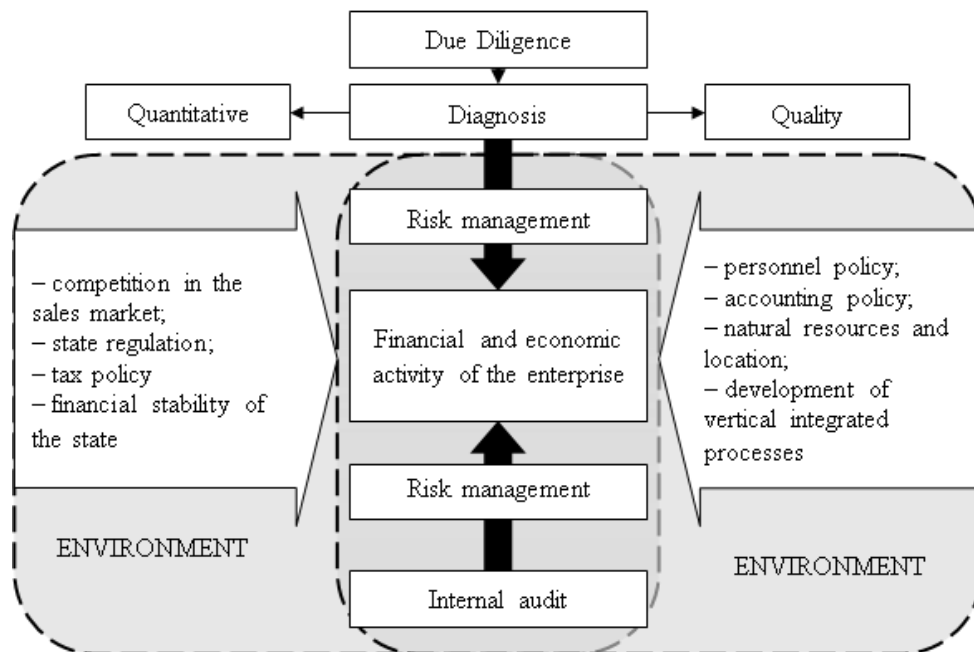


Figure 1: A systematic approach to the Due Diligence procedure

Source: [7]

5. provides a comprehensive assessment of the company's sales, its profits and expenses in the operating period, financing and possible investment from external sources, comparison and consistency with industry-wide indicators and by subgroup of goods and services relevant to the enterprise;

6. analysis of the current assessment using methods of stresses, aimed at determining the possibility of implementation of a given enterprise strategy, checks the compliance of the company strategy with respect to goals and objectives, sales levels set for the financial period and the implementation of planned sales;

7. the conclusion is reached regarding: the market, its competition; introduction of new technologies; prospects for solving strategic issues; the company's existing strategic development plan; key elements of a business plan [6].

Due Diligence plays a major role in managing an enterprise's risk environment. The mechanism under consideration allows to avoid, reduce or minimize the negative consequences. The procedure became a necessary stage of the investment process and it is advisable to carry out the investment before investing the investor in the investment object. Its use allows to identify correctly and in a timely manner the threats during the activity of the enterprise and to make appropriate decisions within the framework of its risk management policy. This process makes it possible to establish a trusting relationship between the buyer and seller of a business or asset.

### **5. Conclusions**

Today, it is necessary to carry out business activities taking into account the risks that may arise in certain circumstances. There is a need for transparency when engaging with stakeholders, investors or partners. This issue is currently relevant for large business entities that have good positions in the market, as well as for business, which is just developing. Any contracting company or investor who plans to invest in a particular business wants to be fully confident in the profitability and security of a future deal. This can be done on the basis of reliable and comprehensive information that can be obtained from a comprehensive Due Diligence audit.

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## EVALUATION OF IMPORTS OF THE REPUBLIC OF BELARUS

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**Abstract:** *The article analyses the development of imports in the Republic of Belarus in dynamics and geographically, as well as by type of goods and services. The methodological basis of the study consists of analysis, synthesis, geographical systematisation, statistical methods, economic and statistical comparisons.*

*As the analysis showed imports provide a significant share of GDP of the Republic of Belarus. Belarus was a net importer of goods, because the share of goods was significant in imports and averaged 88.6% of the total imports for 2012-2018.*

*The article reveals that the Belarusian imports has a lack of geographical and commodity diversification. Goods imports had raw material orientation. Poor geographical diversification indicate significant dependence of the Republic of Belarus on deliveries from foreign countries, primarily from the Russian Federation*

**Key Words:** *foreign trade, imports, goods imports, service imports, Belarus, evaluation, structure, geography, diversification.*

**JEL classification:** F10, F13, F17.

**UDC:** 339.562(476)

### 1. Introduction

Modern international business is characterised by increased economic integration in the world [6], expansion of world economic relations [5,19], entering foreign markets of business entities [8], expanding indebtedness in international financial markets [21], etc. In these conditions, imports are important, since these ensure the country's economic development, including State budget revenue generation [20], foreign exchange inflows, providing of the national market with necessary goods and services, improving performance of business entities.

### 2. Analysis of publications

Numerous studies are devoted to study of foreign trade development in different countries: the countries of Visegrad Four [9], Russia [12, 14, 22], <sup>China</sup> [1, 13], Poland and Ukraine [10] etc. Belarusian scientists are also actively studying foreign trade development [2, 3, 4, 11, 15].

The study of foreign trade of Belarus includes numerous special legislation reflecting the specific features of the foreign trade activities in the Republic of Belarus: Laws of the Republic of Belarus "On State Regulation of Foreign Trade Activity" (No. 347-Z of November 25, 2004), "On Measures to Protect the Economic Interests of the Republic of Belarus in the Implementation of Foreign Merchandise Trade" (No. 346- Z of November 25, 2004), Decrees of the President of the Republic of Belarus "On State regulation of Foreign Trade Activity" (No. 124 of April 5, 2016), "On Some Issues of Customs Regulation" (No. 319 of July 18, 2011), etc.

### 3. The purpose of the article

The purpose of this study is to evaluate the current state and to find the main characteristics of imports of the Republic of Belarus.

**4. Research methodology**

The methodological basis of the study consists of analysis, synthesis, geographical systematisation, statistical methods, economic and statistical comparisons. The study covers the years 2012-2018. Indicators in value terms are given in current prices. The paper provides summary data on the dynamics and significance of Belarusian imports according to the World Bank data (the volumes and growth rates of imports, the shares of import in GDP of Belarus, the shares of goods imports in total imports).

Based on the official indicators of the National Statistical Committee of the Republic of Belarus, the authors conducted a comparative analysis of the dynamics and structure of imports of the Republic of Belarus by main types of goods and services, geographical distribution of imports by major countries.

**5. Obtained results and discussion**

Imports are important for economic development of the Republic of Belarus, as these provide a significant share of GDP. According to the World Bank database [23], the largest share of imports of goods and services in Belarus' GDP was in 2012 and amounted to 74.3%; over the next two years, it reduced to 55.7%. Since 2015, this indicator began to increase and reached 69.1% of GDP in 2018. Such high rates testify the significant share of imports in Belarus' GDP [23]. The share of imports in Belarus' GDP exceeded the share of exports in 2013, 2014 and 2016 [7].

Table 1 shows the dynamics of imports in the Republic of Belarus for 2012-2018. From 2013 to 2016, a significant drop in imports was observed. In particular, imports decreased by USD 18.888 billion (by 38.7%). In 2017-2018 there was intensification of foreign trade. Imports increased by USD 11.331 billion (by 37.9%).

Table 1. Dynamics of Imports of the Republic of Belarus

| Period | Imports     |                 |                 |                           |
|--------|-------------|-----------------|-----------------|---------------------------|
|        | Billion USD | Growth rates, % | Share in GDP, % | Share of goods imports, % |
| 2012   | 48.810      | 99.4            | 74.3            | 92.2                      |
| 2013   | 46.436      | 95.1            | 61.5            | 88.6                      |
| 2014   | 43.908      | 94.6            | 55.7            | 87.9                      |
| 2015   | 32.690      | 74.5            | 57.9            | 86.6                      |
| 2016   | 29.922      | 91.5            | 62.7            | 85.6                      |
| 2017   | 34.436      | 115.1           | 66.6            | 92.0                      |
| 2018   | 41.253      | 119.8           | 69.1            | 87.0                      |

Source: own study based on [23]

The share of goods remained significant in imports. The share of goods imports averaged 88.6% of the total imports for 2012-2018. The share ranged from 92.2% (maximum value) in 2012 to 85.6% (minimum value) in 2016. In 2018, the share of goods imports amounted to 87.0% of total imports. In addition, it should be noted that the balance of foreign trade in goods during 2000-2018 had a negative value (with the exception of 2012). This indicates that Belarus was a net importer of goods.

Table 2 shows comparative data on product groups of imports of the Republic of Belarus for 2012 and 2018 [17, 18]. The structure of goods imports has undergone some changes. Despite the changes that have occurred, imports have retained raw material orientation.

The share of the following product groups decreased: mineral products (by 9.9%), metals and products from them (by 0.2%), and wood, pulp and paper products (by 0.2%). There was an increase in the shares of all other product groups, namely, chemical products (by 1.9%), machinery, equipment and vehicles (by 1.3%), food products and agricultural commodities (by 3.6 %), textiles and textile products (by 0.4%), and other goods (by 3.1%).

Table 2. Structure of Goods Imports of the Republic of Belarus

| Product groups                             | Goods imports   |              |                 |              |
|--|-----------------|--------------|-----------------|--------------|
|  | 2012            |              | 2018            |              |
|  | Million USD     | Share, %     | Million USD     | Share, %     |
| Mineral products                           | 18,283.3        | 39.4         | 11,350.4        | 29.5         |
| Chemical products                          | 5,707.7         | 12.3         | 5,449.0         | 14.2         |
| Machinery, equipment and vehicles          | 10,626.6        | 22.9         | 9,291.8         | 24.2         |
| Food products and agricultural commodities | 3,619.5         | 7.8          | 4,373.6         | 11.4         |
| Metals and products from them              | 4,686.8         | 10.1         | 3,810.6         | 9.9          |
| Wood, pulp and paper products              | 1,020.9         | 2.2          | 783.1           | 2.0          |
| Textiles and textile products              | 1,206.5         | 2.6          | 1,161.7         | 3.0          |
| Others                                     | 1,252.9         | 2.7          | 2,220.9         | 5.8          |
| <b>Total</b>                               | <b>46,404.4</b> | <b>100.0</b> | <b>38,441.1</b> | <b>100.0</b> |

Source: own study based on [17, 18].

The geographical structure of the goods imports of the Republic of Belarus indicates poor geographical diversification. With regard to the geography of goods imports into the Republic of Belarus (see Figure 1) the largest part of goods was delivered from the CIS countries (63.21%) and the EU (18.56%). The share of goods imports from APEC amounted to 11.16% and from other countries 7.07%. The main importing countries were the Russian Federation (58.84%), China (8.22%), Germany (4.81%), Ukraine (3.65%), Poland (3.14%), and Italy (2.05%). This situation may indicate a significant dependence of the Republic of Belarus on deliveries from foreign countries, primarily from the Russian Federation.

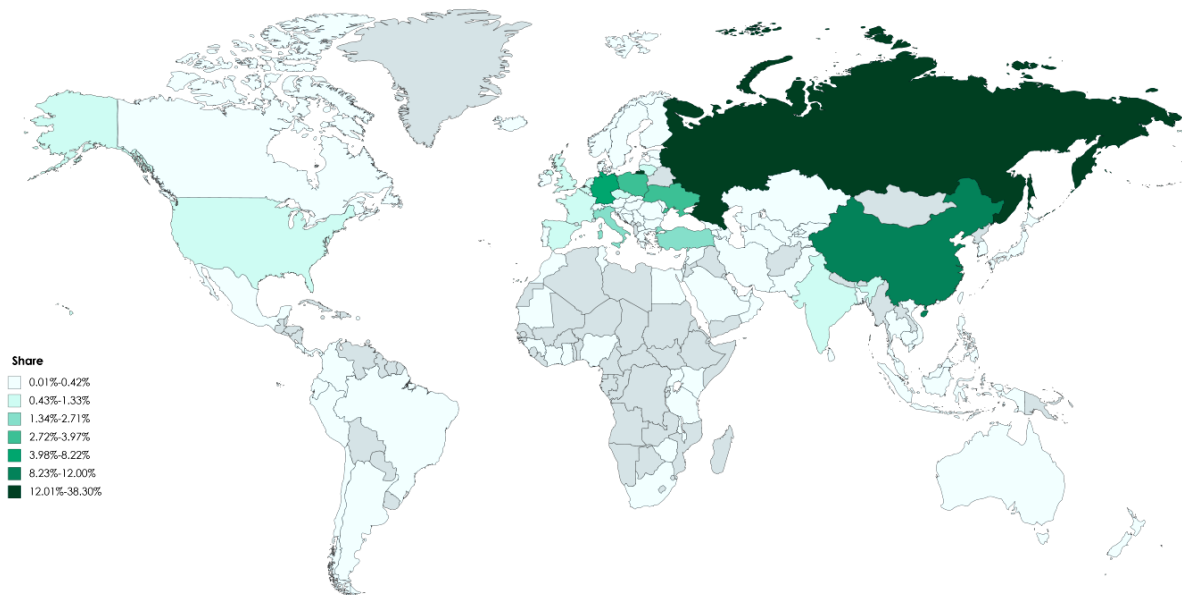


Figure 1. Geographical Structure of Goods Imports into the Republic of Belarus (2018)

Source: own study based on [17, 18]

As for foreign trade in services of the Republic of Belarus, in contrast to trade in goods, the balance of foreign trade in services was positive during 2000-2018 [16]. Moreover, there was a steady upward trend in this indicator from USD 460.5 million in 2000 to USD 3.422.8 million in 2018 [16].

Table 3 and Figure 2 show comparative indicators of service imports of the Republic of Belarus by main types of services for 2012 and for 2018. Thus, in 2018, the following services had the



largest share in the imports into the Republic of Belarus: transport services (34.0%), travel (19.6%), and construction services (18.6%).

Table 3. Structure of Service Imports of the Republic of Belarus

| Services groups  | Service imports |              |                |              |
|--|-----------------|--------------|----------------|--------------|
|  | 2012            |              | 2018           |              |
|  | Million USD     | Share, %     | Million USD    | Share, %     |
| Transport services                                     | 1,475.4         | 36.5         | 1,831.9        | 34.0         |
| <i>Freight transportation</i>                          | 1,153.2         | 28.5         | 1,452.5        | 26.9         |
| <i>Passenger transportation</i>                        | 159.1           | 3.9          | 100.9          | 1.9          |
| <i>Other transport services</i>                        | 156.9           | 3.9          | 273.4          | 5.1          |
| Travel   | 788.6           | 19.5         | 1,057.8        | 19.6         |
| Telecommunications, computer, and information services | 207.9           | 5.1          | 294.6          | 5.5          |
| <i>Telecommunications services</i>                     | 143.5           | 3.5          | 148.5          | 2.8          |
| <i>Computer services</i>                               | 55.9            | 1.4          | 134.6          | 2.5          |
| Construction services                                  | 637.0           | 15.8         | 1,004.9        | 18.6         |
| Manufacturing services on physical inputs              | 15.0            | 0.4          | 6.8            | 0.1          |
| Maintenance and repair services                        | 60.3            | 1.5          | 119.1          | 2.2          |
| Personal and cultural services                         | 28.4            | 0.7          | 31.3           | 0.6          |
| Government goods and services                          | 5.1             | 0.1          | 6.7            | 0.1          |
| Financial services                                     | 203.1           | 5.0          | 278.2          | 5.2          |
| Charges for the use of intellectual property           | 106.8           | 2.6          | 178.6          | 3.3          |
| Insurance and pension services                         | 51.4            | 1.3          | 26.9           | 0.5          |
| Other business services                                | 464.1           | 11.5         | 557.9          | 10.3         |
| <b>Total</b>   | <b>4,043.1</b>  | <b>100.0</b> | <b>5,394.7</b> | <b>100.0</b> |

Source: own study based on [17, 18]

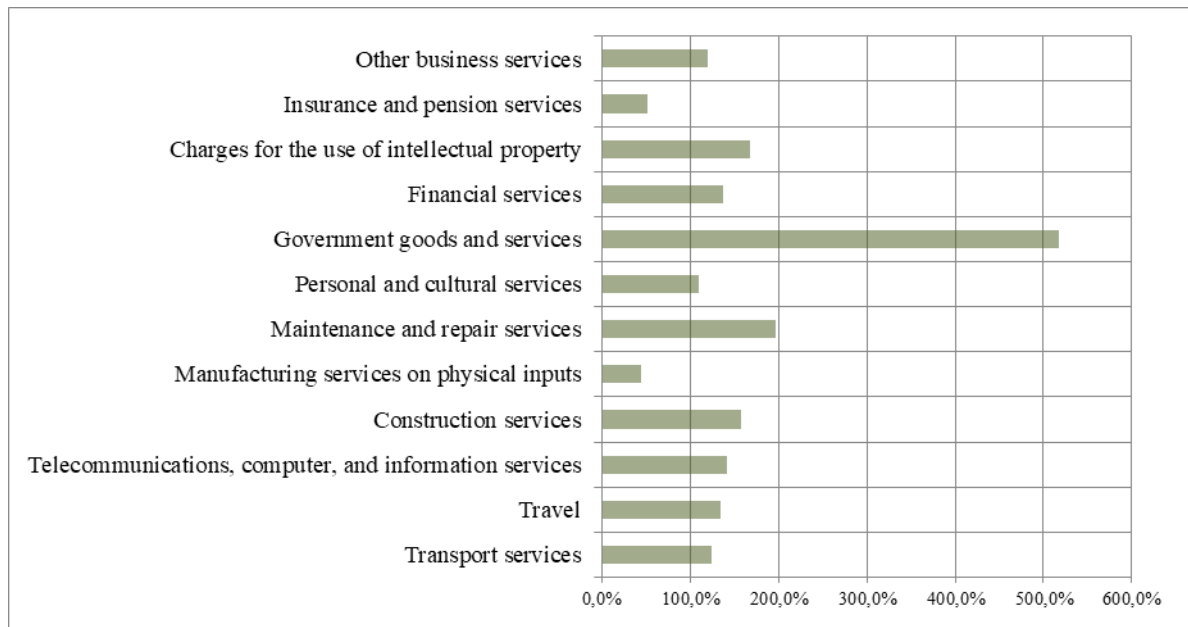


Figure 2. The growth rates of Belarus' services imports in 2018 compared to 2012

Source: own study based on the [17, 18]

Changes in services imports were associated with an increase in the following types of services imports: government goods and services (by 417.6%), repair and maintenance services (by 97.5%), charges for the use of intellectual property (by 67.2%), construction services (by 57.8 %), telecommunication, computer and information services (by 41.7%), financial services (by 37.0%), travel (by 34.1%), transport services (by 24.2%), personal and cultural services (by 10.2%), and other business services (by 20.2%). At the same time, the following types of services imports decreased: manufacturing services on physical inputs (by 54.7%), and insurance and pension services (by 47.7%).

The geography of services imports has changed more significantly. The share of imports from the CIS countries increased by 7.7% and amounted to 39.0%, the share of imports from non-CIS countries amounted to 61.0% in 2018.

## 6. Conclusions

The analysis of imports in 2012-2018 allows the following conclusions:

1) Imports decreased from 2012 to 2016. In 2016-2018 there was an increase in imports indicators.

2) Imports in goods had a significant share in the structure of imports. At the same time, there have been poor diversifications of products and geographical destination.

3) Government goods and services increased significantly in 2018 compared to 2012.

4) The Belarusian imports has a lack of geographical and commodity diversification.

Today the Republic of Belarus implements an import substitution policy. The policy involves expanding the share of providing the domestic market with domestic goods and the development of competitive national production.

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**APPLIED ASPECTS OF ANALYSIS AND CASH-FLOW MANAGEMENT OF  
AGRICULTURAL ENTERPRISES**

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**Abstract.** *The difficulty in promoting the solvency of agricultural enterprises usually lies in the lack of highly liquid assets, i.e. money. A stable financial condition of business entities is possible subject to effective control over cash flow and improved cash flow management. By cash flows, we mean a set of time-distributed receipts and expenditures of money generated by the economic activity of the enterprise. To optimize the management of financial resources of agricultural enterprises, it is proposed to diagnose cash flows in the following stages: horizontal and vertical analysis; calculation of absolute indicators; analysis of the adequacy of cash flows; evaluating the synchronicity of cash flows; analysis of the efficiency and profitability of the company's cash flows. An example of the implementation of the proposed methodology for analyzing cash flow was carried out according to the financial statements of the Avangard agricultural holding. As a result of the analysis, it was found that due to the increase in the efficiency of cash flow management, the company managed to optimize their movement and achieve a positive net cash flow. Among the effective measures for managing the cash flows of the agricultural holding, the following were identified: restructuring of credit obligations with the majority of Ukrainian and foreign investors; increase in sales volumes by increasing the share of receivables; development of sales through highly profitable retail chains; investing in the implementation of product safety and quality systems and energy-efficient complexes, due to which it was possible to reduce the production cost.*

**Keywords:** *cash flow; net movement of funds; sufficiency of cash flows; synchronicity of cash flows; profitability of cash flows*

**JEL Classification:** C10, Q14

**UDC:** 334.72:338.43(477)

## **1. Introduction**

The successful functioning of an enterprise in a market economy is possible only due to the continuous flow of funds, the level of consistency of which in terms of volume and time largely depends on the liquidity, financial stability and future efficiency of the enterprise.

The importance of the role and significance of cash flows for the effective operation of modern enterprises is confirmed by the results of studies by the Small Business Administration of USA [1]:

1) lack of financial resources is one of the reasons why small businesses fail (68.9% of owners are afraid of losing their business due to a possible loss of access to funds)

2) 58.2% of entrepreneurs rate the delay in receiving funds from buyers as the biggest challenge in managing cash flows;

3) 37.5% of top managers of enterprise management consider cash flow a difficult aspect of their activities.

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

Analysis and management of cash flows of enterprises were studied in their works by such researchers as: I. A. Blank [2], I. A. Kriukova. [3], I. S. Litvin [4], A. M. Podderiohin [5], Yu. M. Tiutiunnik [6] and other scientists. In the works of scientists, the sequence of analysis of cash flows covers from 5 to 8 stages. In particular, in [2] a methodological approach is described, according to which it is advisable to analyze the cash flows of an enterprise in 5 stages: studying the dynamics of the volume of formation of a positive cash flow; assessment of the volume of negative cash flow formation; studies of the balance of cash flows; studying the synchronicity of cash flows; assessment of the effectiveness of cash flows. Seven stages of the analysis of enterprise cash flows are distinguished in [4, 6]. However, existing studies lack a unified methodology for analyzing cash flows, including for agricultural enterprises.

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

The purpose of the article is to substantiate the methodological and applied aspects of the analysis and management of cash flows of agricultural enterprises.

## **4. Materials and methods**

Money plays various roles in operating, investing and financing activities of an enterprise. Each business transaction is accompanied either by the receipt or expenditure of money. The movement of cash flows can be dealt as a turnover of funds, that is, their receipts and payments for a certain period of time [2]. According to Ukrainian accounting regulations, a cash flow means the inflow and outflow of money and money equivalents. In our opinion, cash flows are a set of receipts and expenditures of money distributed over time, generated by the economic activity of an enterprise.

After analyzing a number of studies [2-6], it is proposed to carry out the diagnostics of cash flows of agricultural enterprises in the following stages: horizontal and vertical analysis of cash flows (stages 1 and 2); calculation of absolute indicators of cash flows (stage 3); analysis of the adequacy of cash flows (stage 4); evaluating the synchronicity of cash flows (stage 5); analysis of the efficiency and profitability of the company's cash flows (stage 6 and 7).

With the help of horizontal analysis, the dynamics and trends of changes in positive and negative cash flows are investigated. Vertical analysis allows assessing the structure of cash flows, that is, calculating the share of individual sources of income and areas of spending in the total.

Among the absolute indicators of cash flows, it is advisable to single out the Cash-Flow indicator and liquid cash flow. The most common method of calculating Cash-Flow is that depreciation deductions for the corresponding period are added to the net profit. Liquid cash flow characterizes the changes in the net credit position (the difference between the amount of loans received by the company and the amount of money) of the company during a certain period.

Cash flow analysis (stage 4) involves determining the adequacy of the net cash flow generated by the company to finance the necessary needs. Research at this stage is carried out by calculating the following indicators: the ratio of the adequacy of the net cash flow; Cash-Flow sufficiency ratio; ratio of Cash-Flow to current accounts payable.

To assess the synchronicity of the formation of funds, the liquidity ratio of the cash flow is used for individual time intervals during the analyzed period. To ensure the necessary liquidity, the value of the liquidity ratio of the cash flow must be at least 1.

The generalizing indicator of the assessment of cash flow is the coefficient of efficiency of the company's cash flows, calculated as the ratio of positive cash flow to negative cash flow. The financial condition of the enterprise is recognized as stable if a balance is ensured between the receipt and expenditure of funds, that is, when the value of the cash flow efficiency ratio is close to 1.

When calculating profitability indicators, the financial result obtained is compared with the company's cash flows. Among the indicators of the profitability of cash flows, it is advisable to calculate the profitability of the funds received, the profitability of the money spent and the profitability based on the cash flow.

### 5. Obtained results and discussion

According to the proposed methodology, an analysis of cash flows was carried out on the example Avangard – one of the largest agricultural holdings in Ukraine and the leader in the production of eggs and egg products. As of the end of 2018, Avangard held 30% of the industrial egg market and 66% of the dry egg products market in Ukraine. The said agricultural holding is the largest exporter of eggs and dry egg products and sells products mainly to the Middle East, Africa, Asia, as well as the CIS and the EU member states. For the study, data from open sources were used.

Based on the horizontal and vertical analysis of Form No. 3 "Statement of Cash Flows" [7] (stages 1 and 2), it was concluded that the net cash flow from operating activities was positive and increased in 2018 compared to 2017. As a result of effective cash flow management, we managed to obtain a net profit of UAH 444.5 million, which is UAH 262.1 million more than in 2017. The company's current assets in 2018 increased by UAH 279.9 million against the previous year, mainly due to an increase in accounts receivable, which had a positive effect on sales volumes. There was an outflow of funds for investment activities in 2016-2018. In 2018, it amounted to UAH 180.6 million against UAH 105.9 million in 2017 and UAH 1,190 million in 2016. At the same time, the company directed funding for the renovation of fixed assets. In 2018, there was no movement of funds for financial activities. The agricultural holding Avangard was in the process of negotiations with various groups of creditors to agree on the terms of a comprehensive debt restructuring. The interest rate was significantly reduced, and the bulk of the debt repayment was carried over to the second half of the repayment period.

Based on the financial statements of the Avangard agricultural holding, it was established that in 2018, due to the increased efficiency of cash flow management, it was possible to optimize their movement and achieve a positive net cash flow (Table 1).

Table 1 Analysis of cash flows of the Avangard agricultural holding, thousand UAH

| Indicator   | 2016     | 2017    | 2018    | Deviation (+,-) |           |
|---|----------|---------|---------|-----------------|-----------|
|   |          |         |         | 2018/2016       | 2018/2017 |
| Net cash flows from operating activities                    | 1093285  | 105615  | 189745  | -903540         | 84130     |
| Net cash from investing activities                          | -1190661 | -105857 | -180557 | 1010104         | -74700    |
| Net cash flows from financing activities                    | 0        | -1283   | 0       | 0               | 1283      |
| Net cash flows for the reporting period                     | -97376   | -1525   | 9188    | 106564          | 10713     |
| Balance at the beginning of the year                        | 102651   | 5275    | 3750    | -98901          | -1525     |
| Impact of changes in exchange rates on the balance of funds | 0        | 0       | 0       | 0               | 0         |
| Balance at the end of the year                              | 5275     | 3750    | 12938   | 7663            | 9188      |

Source: summarized according to the financial statements of the Avangard agricultural holding [7].

The conclusion on the quality of cash flow management of the enterprise, presented in Table 1, is done by a combination of positive and negative values of net cash flows from operating, investment and financial activities according to the methodology [8], in accordance with the template (Table 2).

Table 2 Template for determining the level of quality of enterprise cash flow management

| Indicator                                | Direction of cash flow ("+" - positive or "-" - negative) |        |     |
|--|---|--------|-----|
| Net cash flows from operating activities | +   | +      | -   |
| Net cash flows from investing activities | -   | -      | -   |
| Net cash flows from financing activities | -   | -      | -   |
| Management quality level                 | High  | Normal | Low |

Source: summarized according to [8].

The conducted research indicates that the quality of cash flow management in the Avangard agricultural holding is characterized as high. This means that as a result of operating activities, in particular from the sale of products, the company receives enough money to be able to make investments, as well as repay borrowed loans.

As a result of the analysis of information from open sources, including the website of the Avangard agricultural holding, it was found that in order to improve the efficiency of cash flow management the company:

- initiated negotiations on the restructuring of loan obligations with the majority of Ukrainian and foreign investors;
- increased sales volumes by increasing the share of receivables, that is, supplied its goods for sale without prepayment or with partial prepayment;
- expanded the list of countries for exporting main products (for example, in 2018 the company received official permission to export category "A" eggs to the EU);
- opened a new direction and began to export the carcasses of laying hens to foreign markets (in 2018, she sold these products to 6 countries of the world);
- in the domestic market, the company focused on the development of sales through highly profitable retail chains;
- invested funds in the implementation of product safety and quality systems;
- launched biogas complexes, due to which it was possible to reduce the cost of production.

The assessment of the sufficiency, synchronicity and efficiency of the cash flows of the agricultural holding (stages 3-6) was carried out on the basis of calculations of absolute and relative indicators, which are summarized in table. 3.

Table 3 Calculation of absolute and relative indicators of cash flows of the agricultural holding "Avangard"

| No  | Indicator  | 2016     | 2017     | 2018     | Deviation (+,-) |           |
|-----|--|----------|----------|----------|-----------------|-----------|
|     |  |          |          |          | 2018/2016       | 2018/2017 |
| 1.  | Net financial result: profit (loss), thousand UAH                                  | -485726  | 182378   | 444502   | 930228          | 262124    |
| 2.  | Depreciation, thousand UAH   | 60655    | 61137    | 66094    | 5439            | 4957      |
| 3.  | Cash flow (Cash-Flow), thousand UAH (No 1 + No 2)                                  | -425071  | 243515   | 510596   | 935667          | 267081    |
| 4.  | Long-term bank loans, thousand UAH:  |          |          |          |                 |           |
|     | a) at the beginning of the year  | 0        | 645923   | 592640   | 592640          | -53283    |
|     | b) at the end of the year  | 645923   | 592640   | 0        | -645923         | -592640   |
| 5.  | Short-term bank loans, thousand UAH: a) at the beginning of the year               | 0        | 0        | 0        | 0               | 0         |
|     | b) at the end of the year  | 0        | 0        | 0        | 0               | 0         |
| 6.  | Cash and cash equivalents, thousand UAH:   |          |          |          |                 |           |
|     | a) at the beginning of the year  | 102651   | 5275     | 3750     | -98901          | -1525     |
|     | b) at the end of the year  | 5275     | 3750     | 12938    | 7663            | 9188      |
| 7.  | Liquid cash flow, thousand UAH ((No 4b + No 5b – No 6b) – (No 4a + No 5a – No 6a)) | 743299   | 51758    | 601828   | -141471         | 550070    |
| 8.  | Net cash flow, thousand UAH  | -97376   | -1525    | 9188     | 106564          | 10713     |
| 9.  | Repayment of loans, thousand UAH   | 645923   | 1283     | 0        | -645923         | -1283     |
| 10. | Increase in reserves, thousand UAH   | 187296   | -408161  | 9802     | -177494         | 417963    |
| 11. | Payment of dividends, thousand UAH   | 0        | 0        | 0        | 0               | 0         |
| 12. | Net cash flow adequacy ratio (No 8 / (No 9 + No 10 + No 11))                       | -0,117   | 0,004    | 0,937    | 1,054           | 0,934     |
| 13. | Current liabilities and collateral, thousand UAH                                   | 17797854 | 14554458 | 18538265 | 740411          | 3983807   |
| 14. | Current financial investments, thousand UAH  | 0        | 0        | 0        | 0               | 0         |
| 15. | Debt (net), thousand UAH (No 13 – No 6b – No 14)                                   | 17792579 | 14550708 | 18525327 | 732748          | 3974619   |
| 16. | Cash-Flow sufficiency ratio (No 3 / No 15)   | -0,024   | 0,017    | 0,028    | 0,052           | 0,011     |
| 17. | Current accounts payable, thousand UAH   | 1238058  | 2063948  | 8842377  | 7604319         | 6778429   |
| 18. | Cash-Flow to current accounts payable ratio (No 3 / No 17)                         | -0,343   | 0,118    | 0,058    | 0,401           | -0,060    |
| 19. | Positive cash flow, thousand UAH   | 1093285  | 105615   | 189745   | -903540         | 84130     |
| 20. | Negative cash flow, thousand UAH   | 1190661  | 107140   | 180557   | 1371218         | 73417     |
| 21. | Cash flow liquidity indicator (No 19 – (No 6b – No 6a)) / No 20                    | 1        | 1        | 1        | 0               | 0         |
| 22. | Efficiency indicator of cash flows (No 19 / No 20)                                 | 0.918    | 0.986    | 1.051    | 1.969           | 0.065     |

Source: authors' own calculations based on the financial statements of the Avangard agricultural holding [7].

The results of Table. 3 indicate that in 2018 against 2017, the cash flow indicator (Cash-Flow) increased by UAH 267,100,000, including due to net profit – by UAH 262.1, depreciation – by UAH 5.0.

During the same period, net cash flow increased by UAH 10.7 million, due to which the net cash flow adequacy ratio increased from 0.004 to 0.937. This indicates that in 2018 these funds covered 93.7% of the amount of loan repayments and the increase in reserves.

The Cash-Flow adequacy ratio, which is determined by the ratio of cash flow to debt, in 2017 was 0.017, and in 2018 it increased to 0.028, which increased the company's ability to pay off its debts through highly liquid assets.

The ratio of Cash-Flow to current accounts payable decreased from 0.118 (2017) to 0.058 (2018), that is, the growth rate of Cash-Flow is significantly lower than the growth rate of current accounts payable.

The liquidity ratio of the cash flow for 2016-2018 is 1, which indicates the synchronization of cash flow. The cash flow efficiency ratio hovers around 1 (0.918 - in 2016; 0.986 - in 2017; 1.051 - in 2018). This level indicates the rational proportions of the movement of funds in the enterprise.

At the last stage, the indicators of profitability of cash flows of the agricultural holding "Avangard" (stage 7) were calculated, the calculation results of which are given in Table. 4.

Table 4 Calculation of indicators of profitability of cash flows of the Avangard agricultural holding

| No | Indicator   | 2016    | 2017    | 2018    | Deviation (+,-) |           |
|----|---|---------|---------|---------|-----------------|-----------|
|    |   |         |         |         | 2018/2016       | 2018/2017 |
| 1. | Net financial result: profit (loss), thousand UAH                           | -485726 | 182378  | 444502  | 930228          | 262124    |
| 2. | Net income from the sale of products (goods, works, services), thousand UAH | 3161016 | 3520633 | 3276797 | 115781          | -243836   |
| 3. | Positive cash flow, thousand UAH  | 1093285 | 105615  | 189745  | -903540         | 84130     |
| 4. | Negative cash flow, thousand UAH  | 1190661 | 107140  | 180557  | -1010104        | 73417     |
| 5. | Net cash flow, thousand UAH   | -97376  | -1525   | 9188    | 106564          | 10713     |
| 6. | Return on funds received,% (No 1 / No 3 × 100)                              | -44.4   | 172.7   | 234.3   | 278.7           | 61.6      |
| 7. | Return on funds spent,% (No 1 / No 4 × 100)                                 | -40.8   | 170.2   | 246.2   | 287.0           | 76.0      |
| 8. | Profitability based on cash flow,% (No 5 / No 2 × 100)                      | -3.1    | -0.043  | 0.280   | 3.4             | 0.3       |

Source: authors' own calculations based on the financial statements of the Avangard agricultural holding [7].

The indicators of profitability of cash flow in 2016 had negative values for the unprofitable activities of the agricultural holding. Due to the outstripping growth in net profit compared to positive and negative cash flows, the aggregate level of profitability of the cash flow increased from -3.1% in 2016 to 0.28% in 2018.

Thus, improving the efficiency of cash flow management allowed the company to obtain a positive profitability of the use of funds.

## 6. Conclusions

The complex use of the proposed stages of analysis and the system of indicators for assessing the cash flows of agricultural enterprises makes it possible to determine the level of sufficiency of the formation of funds, the efficiency of their use and achieve a balance of positive and negative cash flows, to establish positive and negative trends, existing and potential problems associated with the formation and use of money funds, assess the effectiveness of cash flow management to develop the necessary management decisions. The proposed methodology for analyzing cash flows can be applied to other types of activities.

The most significant measures of cash flow management are determined: restructuring of credit obligations; increase in sales volumes by increasing the share of receivables; promotion of sales through highly profitable retail chains; investing in the implementation of safety and product quality



systems and the use of energy-efficient complexes, due to which it is possible to reduce the cost of production.

Further improvement of the efficiency of cash flow management at the enterprise can be achieved through:

- reducing the level of fixed and variable costs;
- application of the accelerated depreciation method;
- sales of fixed assets, intangible assets and inventories that are not used;
- strengthening control over accounts receivable.
- Among the measures that contribute to the optimization of cash flows and, accordingly, the activation of entrepreneurship, at the national level, the following can be distinguished:
  - reduction of tax pressure and maximum simplification of tax administration procedures;
  - providing with the modernization and restructuring of the production and resource potential, reducing its energy and material consumption;
  - support of production by stimulating consumer demand of the population, expanding the share of the solvent domestic market;
  - providing with reliable legal protection of entrepreneurial activity, avoiding from permanent changes in legislation.

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**FURTHER PROSPECTS FOR THE NATIONAL AGRARIAN BUSINESS  
DEVELOPMENT IN THE CONTEXT OF EUROPEAN INTEGRATION REFORMS  
IN UKRAINE**

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**Abstract:** Continuous export-oriented development of the Ukrainian agrarian business to become active participant in the European Union market can be achieved, among other things, through the development of the niche food production. The article determines main reforms that influence Ukrainian agro-industrial sector capacity in the context of the EU market and explains their impact on global competitiveness of agrarian business entities.

Key reforms that determine Ukrainian agro-industrial sector role in the EU market are detailed and their impact on competitiveness of national agrarian business is examined. The authors state that the pro-European reforms in Ukraine have created many opportunities for Ukrainian enterprises to produce and ultimately supply to the EU markets high quality processed food products, including niche specific ones.

In 2018 compared to 2015, the value of the Ukrainian exports of animal products had increased 2.3 times, vegetable products – 1.5 times, fats and oils – 1.7 times, processed foods – by 19%. Ukraine thus became the fourth largest supplier of agricultural and food products to the EU.

Conducted recent respective social surveys identified the following areas as the most crucial for the Ukrainian business: opening further access to the EU markets through export duties reduction; implementation of the national quality control and food safety system based on hazard analysis and critical control points (HACCP); improvement of the legal framework for organic food production in Ukraine and its adaptation to the relevant EU acquis; further simplification of customs procedures.

**Keywords:** agrarian business; association agreement; comprehensive free-trade area; European integration; export; foreign trade; niche products; European reforms.

**JEL Classification:** Q13, F63

**UDC:** 339.94

## **1. Introduction**

According to the Association Agreement between the European Union and Ukraine (2014) and Export Strategy of Ukraine (2017), development of trade relations between Ukraine and the European Union under the Profound and Comprehensive Free Trade Area remains at the very heart of their bilateral relationship. Although, the very competitive high-tech production in Ukraine remains its key economic priority, the agro-industrial sector (AIC) is still one of the most important export sectors of the Ukrainian economy. So, in 2018 it had generated almost 40% of all foreign trade. On the other hand, the European Union is a strong agrarian global player that actively protects its domestic market with respective tariff quotas. The protected product categories are mainly agricultural products such as: wheat, honey, eggs, milk, etc. Therefore, further prospective export-oriented development of the Ukrainian agribusiness towards the EU market is possible through the development of niche food production. The niche food products are such products of the agro-industrial complex which have special quality and

innovative features that meet modern food trends (organic, healthy foods, sports nutrition with reduced fat and sugar content, bio-foods, vegetarian and vegan food, gluten-free products, etc.). Such properties allow these products to take over a very specific segment of consumers in the EU market.

Here we proceed from the premise that the international trade creates advantages for all trading parties involved as acknowledged by many famous economists, including D. Ricardo's theory of comparative advantages (Ricardo, 2004), Heckscher-Ohlin's theorem (cited in Findlay, 2006), R. Vernon's theory of the product life cycle (Vernon, 1966), Porter's national Competitive Advantage Model (Porter, 1998) etc. Furthermore, E. Cox and R. Alm (1999) argue that foreign trade should be profitable to a state even if it has foreign trade deficit, although the main precondition here is that such state's economy should enjoy high competitiveness and attractiveness for external investments. Despite positive effects as explained above, it is also true, according to other international trade theories and empirical evidence, that trade globalization when implemented in an inefficient way may lead to sharper disproportions between the rich and poor countries. Thus, there are also claims that stress that current processes of globalization may result in large number of poor countries demonstrating regression and primitive production expansion (Reinert, 2008)

At present, the mutually beneficial economic relations supported by international trade constitute the key principle for the international cooperation process (Mikichurova, 2015). In view of the fact that Ukrainian exports to EU mostly include agrarian products our country finds itself at an obvious disadvantage as compared to highly value-added European products. Thus, further search for such trade cooperation directions between the EU and Ukraine that would benefit both partners at the most becomes particularly important for the national economy.

Based on the statement that the agrarian sector has great importance for the national security and constitutes one of the biggest exporting sectors in Ukraine-EU trade, the following points in this context will be addressed in this article:

- the main trends in the export of food products following the DCFTA implementation in the national economy;
- specific features of institutional environment in which exporting enterprises operate;
- any type of exporters' support by respective official institutions or other relevant factors that reduce or eliminate DCFTA benefits for the Ukrainian agrarian business; and
- which economic reforms conducted under the Association Agreement would contribute to the increased Ukrainian food exports, and which of those would have the greatest positive impact.

We will also try to identify the main reforms influencing Ukrainian agro-industrial sector development in the context of EU market participation and consider their impact on global competitiveness of agribusiness enterprises. To do so we will analyze existing trends in the export of niche food products after introduction of the DCFTA in Ukraine, explore the institutional environment in which exporting enterprises operate, and identify specific reforms under the Association Agreement with the most effective impact on expansion of the Ukrainian food exports.

## **2. Research methods**

The methodical background for assessment of the Ukrainian economic system integration with the EU standards was developed by the authors in earlier works providing the basis for comparative analysis of economic integration level of specific Ukrainian regions (Polissya Foundation for International and Regional Studies, 2015). In general, conclusions were made that over the period of 2014-2016 the overall level of openness of the regional economic systems as relates to trade with the EU as well as the gradual adaptation of the Ukrainian producers toward the new political and economic realities were well underway (Polissya Foundation for International and Regional Studies, 2018). Wider spectrum of trade cooperation directions between Ukraine and the EU that will contribute to increased Ukrainian export competitiveness on the EU market and create mutually beneficial conditions for trade partners, had been defined in the study of T. Zosymenko and V. Rybchak (2018). Resulting from it was the acknowledgement that the stimulation of the production of niche food products should become one of the priorities of national trade policy within the context of EU trade.

### **3. Research results and discussion**

Such conclusions are based on the combination of theoretical and empirical methods. To support this and identify export trends relative to the agrarian niche products following the DCFTA introduction the following methods were used: review of the official statistics data, analysis of dynamics and product structure of the trade between Ukraine and the EU, comparison of foreign trade activity indicators of domestic enterprises before and after the DCFTA introduction. Cherkasy, Chernihiv and Sumy regions were selected as main target regions for the study. Compared to the western regions of Ukraine, the geographical principle of territorial approximation cannot be applied to these regions, thus it has traditionally been more difficult for them to establish supply chains with the EU countries. Nevertheless, there are examples of businesses which have successfully implemented European requirements as relates to the food production and observed by the European consumers. Therefore, their experience and achievements in the field of niche food production deserves more detailed examination.

Firstly, the institutional environment in which exporting enterprises operate was studied on the basis of the following methods: examining of national and regional strategic and programmatic documents, programs and projects of exporters' support by the international organizations, analysis of commercial export infrastructure to determine the extent of available relevant professional services as well as their quality level, and also the support from exporters by governmental and non-governmental institutions. Also, inductive-deductive method was used to assess interaction and coordination of respective efforts by the government and non-profit organizations to support export of niche foods. The central instrument of this methodology was a sociological survey which allowed to assess the impact of reforms on the development of agricultural markets with the primary focus on niche segment, as well as identify successful examples of niche agricultural exports from the target regions to the EU.

This sociological survey was conducted in two stages: 1) researching focus groups in target regions in order to identify successful examples of developing markets for the EU-targeted niche producers; 2) conducting in-depth interviews in the target regions to detail regional success stories of the niche agro-industrial exports. This study also used wide spectrum of data from other sources: books on the topic, academic papers and periodicals, other interviews and questionnaires, information from the Internet as well as other available materials on the EU-Ukraine trade.

Based on the gathered information we can say that since signing of the Association Agreement between Ukraine and EU, which effectively laid the foundation for bilateral trade liberalization, the Ukrainian exports dynamics has been developing quite positively. Interim application of DCFTA came into effect on January, 1, 2016, however in April, 2014, the EU had introduced autonomous trade preferences for Ukraine in order to support its economy during crisis period. In addition to the DCFTA trade regime, Ukrainian exporters could also continue selling their products to the EU under the Generalized System of Preferences for two more years. This presented significant liberalization of access to the EU market for many Ukrainian products, thus considerably increasing their competitiveness. Due to the launch of DCFTA, such as the reduction of export duties to 0% for over 95% of exportable product items from Ukraine, the EU market has become very attractive for domestic producers of agricultural products.

However, the major benefits from entering the EU market would be mostly enjoyed by food industry companies producing top quality products with advanced formulations (e.g., with the reduced content of fat, sugar, salt, enhanced with microelements for healthy lifestyles, products for allergic individuals, etc.) made out of local materials. Products in this niche enjoy stable high demand in the EU and are also exempt from the tariff quotas. The mentioned trade liberalization measures resulted in the increase of agricultural and food exports to the EU in 2016-2018, and compared to 2015 the value of the exports of animal products had increased 2.3 times, vegetable products – 1.5 times, fats and oils – 1.7 times, processed food – by 19% (State Statistics Service of Ukraine, 2018). This helped to somehow compensate for the losses from the closure of the Russian market, and also expanded introduction of the European standards of production into operation of the Ukrainian enterprises (Movchan, 2016). As a result, in 2018 Ukraine became the fourth largest supplier of agricultural and food products to the EU (Agrarian Sector in the Association Agreement).

However, the research of production and exports of the niche food products has some difficulties which are directly related to the interpretation and understanding of this category of products as well as the lack of such category in statistical and accounting data. National and regional customs statistics do not sufficiently reflect the product structure of niche products exports, while the data from the State Fiscal Service of Ukraine can only produce a very generalized picture of the dynamics and structure of the niche agricultural products' export (Table 1). It covers mainly product positions of raw materials and products with a low degree of processing, therefore it is quite hard to clearly identify trade items under the category of "niche food products". Nevertheless, we can still identify foreign trade items whose exports have increased most since the DCFTA introduction: leguminous vegetables (488 times), flours and meals of oil seeds or oleaginous fruits (54 times), other vegetables containing no vinegar or acetic acid preservatives (10 times), crustaceans, molluscs and other aquatic invertebrates, prepared or preserved (8 times).

Table 1. TOP-10 export items from Ukraine to the EU countries in 2016-2018 (according to specific codes of tariff classification)

| Product name  | 2016               |                         | 2017               |                         | 2018               |                         |
|---|--------------------|-------------------------|--------------------|-------------------------|--------------------|-------------------------|
|   | Net weight, tonnes | Value, thousand dollars | Net weight, tonnes | Value, thousand dollars | Net weight, tonnes | Value, thousand dollars |
| Fruit juices and vegetable juices, unfermented and not containing added spirit                            | 50338              | 42480                   | 55054              | 70739                   | 51128              | 54589                   |
| Fruit and nuts, uncooked or cooked  | 39222              | 48278                   | 39511              | 57328                   | 45738              | 74386                   |
| Other oil seeds and oleaginous fruits   | 35321              | 28352                   | 27073              | 24908                   | 22125              | 25332                   |
| Dried leguminous vegetables   | 16794              | 7430                    | 55737              | 18067                   | 212525             | 51079                   |
| Linseed   | 10759              | 4383                    | 19481              | 7321                    | 6123               | 3223                    |
| Other nuts  | 7219               | 25477                   | 11513              | 58180                   | 13871              | 61361                   |
| Vegetables, fruit, nuts and other edible parts of plants, prepared or preserved by vinegar or acetic acid | 5937               | 3590                    | 4335               | 2990                    | 3990               | 2982                    |
| Other fruit, fresh  | 3057               | 7450                    | 2915               | 9204                    | 2788               | 6662                    |
| Other prepared or preserved meat, meat offal or blood   | 1941               | 5593                    | 759                | 2207                    | 795                | 2244                    |
| Fruit, nuts and other edible parts of plants, otherwise prepared or preserved                             | 1552               | 2421                    | 1145               | 2052                    | 1118               | 2227                    |

Source: (Data of State Fiscal Service of Ukraine)

Organic food becomes quite an important product category here among listed commodity groups. Thus, attractiveness of the EU market for Ukrainian agrarians and food processors is obvious since EU's organic food consumption levels are much higher than in Ukraine. For comparison, regular EU citizen spends EUR 60.5 a year on organic food products, while in Ukraine consumption of such products per capita constitutes EUR 0.68 a year (Organic Production in Ukraine).

Still, it remains very difficult to observe and analyze organic agri-food exports trends in the country due to the lack of specific and accurate reporting forms for the producers of such products. According to EU data, in 2018 Ukraine ranked 4th among 115 countries exporting organic products to the European market, and 1st among the exporters on the European continent. That year 266.7 tons of organic products were exported to EU countries by Ukrainian domestic producers, which represents 8.2% of the total volume of organic imports to the EU: 70% of that export belongs to cereals, 15% to oilseeds, 5% to fresh and sublimated fruits. Yet, products with the high level of processing (juices, flour, meal, etc.) accounted for mere 6.8% of total organic exports from Ukraine to the EU (Organic

imports in the EU: A first analysis-Year 2018).

In a very positive trend though, it should be said that despite high costs and complexity of ensuring compliance with the European food quality and safety requirements more and more Ukrainian business entities have been lately successfully obtaining respective export permits. The items on that list also include specific niche products (snails, fish delicacies, elite cheeses, etc.). However, it should be recognized that at the regional level such export opportunities are being overlooked, so, for instance, since the introduction of the DCFTA only 15 Ukrainian oblasts (out of all 24) observed an increase in the number of enterprises approved to export different categories of animal origin food to EU countries (Third Country Establishments. List per Country).

Another difficulty relates to the fact that the state regulation of agro-industrial production in Ukraine does not clearly determine the specific component focusing on production stimulation of the niche products. The current system of incentives mostly applies to the producers of well profitable crops (corn and sunflower), with such producers having practically no interest in further advanced processing of their products. Moreover, Ukraine lacks wider remit of the EU standards in respective certification as this is rather complicated and costly procedure so that, for instance, so called "euroleaf" becomes a true luxury that only a few operators in the market can afford. This situation ultimately serves to preserve and entrench a raw material-based exports model which inevitably exhausts Ukrainian soil resources.

Some progress in this context had been made in the summer of 2019 with the adoption of the Strategy for development of export of agricultural products, food and processing industry of Ukraine for the period until 2026 as well as the approval of the Plan of measures for its implementation. Thus, the following main challenges for the further development of the agro-industrial complex of Ukraine in the context of increased export capacity have been identified: transformation of export structure towards the increased share of the processed products; improvement of the foreign market access for domestic exporters; diversification of product positions in agricultural, food and processed goods exports (including organic products). The implementation of this Strategy should provide an effective level of support to the domestic exporters.

In terms of the institutional coordination, it remains quite difficult for Ukrainian entrepreneurs to clearly understand intricacies of the broad network of export support institutions existing in the country. It is still quite hard to distinguish between the functions of different institutions and organizations making it very difficult to find the specific organization well competent in a certain case or issue. The potential for further effective cooperation between business and public authorities in the matters related to foreign markets trade remains underdeveloped due to the lack of trust toward official authorities. Often, the business simply is left uninformed of any special programs or events officially launched to support exporters, and as a result new exporters are left with no support whatsoever in their efforts to enter EU markets. Many entrepreneurs feel at a loss against the background of a long list of various private institutions offering support to foreign trade activities, and trust to independent foreign experts remains quite limited.

Given this background, in order to support new Ukrainian exporters in 2018 the Office for Export Promotion was established under the Ministry for Economic Development. Today, it acts in the capacity of an independent state institution which offers to the Ukrainian producers multiple programs to develop their export competences as well as comprehensive support to enter foreign markets. This is a significant achievement, since the institutional support and guidance of good professionals at early stages of export activities becomes especially important for small producers who have something to offer to the EU market.

The pro-European reforms in Ukraine created many opportunities to produce and sell to EU markets high quality finished food products, niche ones among them. On the other hand, exporters shall operate in line with the implementation of the International system of Hazard Analysis and Critical Control Points (HACCP) approved by the Law of Ukraine "On Basic Principles and Requirements to Food Safety and Quality" and supported by other domestic legal acts. Pursuant to the Chapter 4 of the "Sanitary and Phytosanitary Measures" of the Association Agreement, Ukraine shall implement a national quality control and food safety system equivalent to that of the EU and based on a key principle of ensuring a "farm-to-table" control. Thus, today all companies in Ukraine supplying

food products must have proper permanent procedures implemented based on HACCP. Since this system is integrated into the EU acquis, its observance at Ukrainian companies opens access to EU markets for their products (Adaptation to EU legislation: The focus on Small and medium-sized agricultural producers).

Furthermore, the legal framework for organic food production in Ukraine and its adaptation to the relevant EU acquis needs further elaboration. The national framework to consolidate export capacity of the organic food producers is presented in the recently adopted Law "On Basic Principles and Requirements to Organic Production, Circulation, and Marking of Organic Products" which should help Ukraine to gradually achieve similar level with the EU member-states in production quality, and thus expand possibilities for organic food sales. It is aimed at promoting the entry of the Ukrainian producers to the European markets as well as ensure higher level of the consumer health protection.

There are also parallel initiatives coming from the Ukrainian government, such as tax preferences for organic production; implementation of the National Program for Organic Food Catering to Educational Institutions; reputational, informational, and financial support to stimulate demand for organic food products; facilitation of cooperation between the organic food producers, etc. In this context the results of the Thünen Institute of Farm Economics (2016) study well suggested that the organic farming would be of great importance to Ukraine as it would create more added value and ultimately higher profits. Moreover, many other international and local studies emphasize positive environmental impact of the organic agricultural practices, including benefits of greater biodiversity and higher soil organic matter (Tuomisto et al., 2012).

Gradually yet steadily the organic products market in Ukraine is adapting to the requirements of the Ukraine-EU Association Agreement. The lack of proper regulation in the area resulted in a 100% certification for the market under international standards which caused complexities and incurred high costs of product certification. Local organic producers are still facing the following key challenges:

- laboratory testing of Organic Standard (the only approved certification authority in Europe) takes too long thus leading to a loss of foreign customers;
- duration of the laboratory testing is 3 months, while other European certification bodies may take up to 12 months;
- high costs of production compounded by other challenges make the organic products export to the EU economically unprofitable, unless there is a respective state support provided.

Though, the situation has been somewhat improving following the adoption of the Law of Ukraine "On Basic Principles and Requirements to Organic Production, Turnover, and Marking of Organic Products" (2018) as well as other relevant initiatives from the Ukrainian government outlined above.

It has to be added that there exist quite positive experience of financial support to the organic production provided from the regional budgets as acknowledged by the study: "From Exports of Raw Materials to Exports of Niche Food Products: Opportunities of the Association Agreement. Success Stories from Chernihiv, Sumy, and Cherkasy regions" conducted by the Polissya Foundation for International and Regional Studies (2019). So, in order to reduce the cost of local organic food products and thus enhance their competitiveness in domestic and foreign markets, the Chernihiv regional state administration initiated implementation of the Program of Financial Support to Organic Production in Chernihiv region for 2016-2021. The Program envisages reimbursement of costs to producers of agro-industrial products associated with efforts to ensure EU standards compliance as related to the organic food production (raw materials). Another positive outcome of this program is the establishment of a mechanism to support organic food producers in Sumy region through reimbursing their costs for certification procedures. With the advantages and prospects of organic food production becoming more and more obvious, the Sumy Regional State Administration initiated a mechanism to support local agrarians of this sector. Under the Program for Development of Agro-industrial Complex and Rural Territories 2020 support has been provided to the organic food production. It envisages reimbursement of the 75% of costs incurred by the local agro-industrial companies to organize verification of standards' compliance for the organic food producers as well as obtaining respective certificates.

Based on the aforesaid, the conclusion can be made that for many producers of organic food in Ukraine relevant financial and organizational support from the regional authorities presents a very significant contribution to further strengthening of their position on domestic market as well as expands their export capacity in foreign trade. As such initiatives of local authorities effectively help compensate for large portions of producers' costs and further promote locally produced organic food, this will steadily lead to further increase in the capacity of the overall organic food production in the country and its promotion among both the Ukrainian and foreign consumers. All this creates important preconditions for stimulating more active development of small farms, which will ultimately contribute to better living standards for the rural population.

In the complex of additional support efforts, and in order to simplify export operations with the EU partners the Ukrainian Customs authority had introduced EUR.1 certificates with regard to the transportation of goods. Those provide necessary certification for the products originating from Ukraine and delivered to EU markets under the preferential trade regime. Another important step in this context was the launch of the category of an "Authorized exporter" which enabled independent filing of declarations regardless of the product price. Evidently, such simplification of customs procedures were very well received by the entrepreneurs as those considerably minimize bureaucratic paperwork relative to shipping of goods and products.

#### **4. Conclusions**

European-oriented reforms in Ukraine resulted in the growth of exports of agricultural and food products to the EU markets. Also, they stimulate Ukrainian producers to increase production of ready-to-consume products. Although many experience lack of sufficient financial resources, Ukrainian companies are certain that the continuation of pro-European reforms will ultimately bring additional significant benefits for both business and national economy in general.

Implementation of the Association Agreement contributes not only to further economic development, but also strengthens the sense of security and confidence in the future. Especially for food producers, who are investing much efforts into quality assurance of products by strictly implementing HACCP and promoting transparent business relations, further cooperation with the EU serves as a guarantee for receiving stable orders for their products from the strong and effective partners.

For the country in general, such efforts present more export-based sources for GDP growth. With further expected growth of exports volumes in the future the Ukrainian companies should prepare themselves for increased production, expansion of products' range as well as continue their efforts on certification procedures to fully comply with the EU requirements. It will require from the producers more advanced technological expertise, effective skills to stay well competitive on the international market as well as further contribute to the country's effective integration with the European business community.

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## IMPROVEMENT OF METHODOLOGICAL AND METHODOLOGICAL APPROACHES TO MARKETING RESEARCH IN THE REGION

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**Annotation.** *The article is devoted to the development of methodological and methodological approaches to marketing research in domestic regions, consistent with the trend of their socio-economic development.*

*It is proved that in Ukraine there is no methodological base of scientifically grounded marketing research at the regional level. As a result, the current potential for sustainable socio-economic growth does not correspond to modern needs, does not take into account the peculiarities of territories, already created united territorial communities, does not coordinate their functioning with the strategic goals of the country's development as a whole. This also prevents the regions from implementing systemic transformations with the rational use of resources, and successfully integrating with the country into the global economic space.*

*Today, the decisive place should be occupied by the study of the functioning of the regional economic complex in changing market conditions in order to develop an adequate mechanism of state regulation. Accordingly, there is a need to improve economic analysis, the content of its general methodology and possible methodological approaches. In this regard, the system of statistical indicators for analysis requires significant changes. A schematic diagram of the analysis of various levels of the economy on the basis of a system of indicators specially selected for these purposes is proposed.*

*It is emphasized that in order to implement sustainable socio-economic development of the region, special attention should be focused on the formation of methodological and methodological approaches to marketing research in the region with the development of a basic scheme for their implementation. The development of the scheme provides, along with a generalization of previous statistical practices and methodology of economic analysis, theoretical justification of the scheme, are being developed.*

**Key words:** *region, research, analysis, statistics, information, development, marketing, method, process, evaluation.*

**JEL classification:** M31

**UDC 005.22: 332.1: 339.138(477)**

### 1. Introduction

The initial methodological prerequisite for a comprehensive analysis of the region's economy, which is an integral and at the same time a specific part of its management, is the identification of the characteristics of the region as an object of economic analysis.

### 2. Statement of the task

**Statement of the task** consists in creating a schematic diagram of the analysis of socio-economic processes, which assumes the unity of approaches to the analysis of various levels of the economy on the basis of certain indicators.

### 3. Analysis of researches and publications

The following scientists devoted their work to the problems of sustainable socio-economic development of domestic regions and the importance of marketing research: A. Amosha, B. Burkinsky [3, 4], S. Grinevsky [6], T. Derkach [16], Mantsurov I. [11], Merkulov M. [15, 16], Nekrasova L. and

Diskin A. [12], Simonenko V., Snezhnaya A. [14], Kharazishvili Yu. [17, 18], Khvesik M., Khovrak I. [19]. So, from the point of view of the authors, to solve modern problems of the regional economy: «... has a political course for deep decentralization of power» [5, p. 73].

I. Khovrak in his study considers sustainable civilizational regional development «... as a long process of reconstruction of the region through taking into account the existing potential, harmonizing the interests of stakeholders and establishing communication, the optimal balance of environmental, social and economic goals, social justice, cohesion and responsibility, which leads to the emergence of regional identity» [19, p. 62].

Snezhnaya A. makes the following conclusion in her work: «Diversification of the economy of an old industrial region is a process of improving its structure, aimed at changing the sectoral structure and form of organization of the productive forces of the region through penetration into other sectors of the national economy and redistribution of resources into new ones, including , innovative spheres of economic activity in order to ensure stable conditions of functioning, to obtain economic benefits of the old industrial region, to increase the level of its competitiveness» [14, p. 55-56].

Kharazishvili Yu. insists: «The structural component of the development of a country or region is a part of macroeconomic development together with formal, informal infrastructure, together with investment and financial, innovation, socio-demographic, ecological and recreational, external and internal development, determine the state of sustainable development of the region» [17, p. 243-244]. Also, it emphasizes the existence of synergistic ties between regions of Ukraine [18, p. 51].

**The subject of the research** is the methodology of conducting marketing research in the regions of Ukraine, consistent with the trend of their socio-economic development.

**The purpose of this article** is to form methodological and methodological approaches to marketing research, the use of which will contribute to the creation of sustainable socio-economic development of the region.

#### 4. Obtained results and discussion

Let's make an attempt to approach the solution of the assigned tasks by clarifying the definition of the concept of «region». So, V. Symonenko defines this concept as follows: «...a region is a territory of a country with specific natural, climatic and economic conditions, a characteristic direction of the development of productive forces, taking into account demographic, historical, social characteristics, the development of which is carried out on the basis of the laws of the national regional economy, as a result of which regional economic relations are formed» [10, p. 164]. Dergachev V. provides a short definition: «a region is a special type of territory, which is characterized by specific criteria for identifying its border» [7, p. 377]. A large economic dictionary summarizes: «a region is a region, a district, a part of a country that differs from other regions by a set of natural and / or historically formed relatively stable economic and geographical features, which are often combined with the peculiarities of the national composition of the population» [2, p. 863]. Another dictionary – Oxford – provides the following definition: «a development region / area requiring economic development: in the UK, an area that is eligible for government subsidies and subsidies in order to stimulate investment and improve the employment situation» [1, p. 196]. Each of the above definitions reveals certain features of the region as an economic category: a large territory, more or less homogeneous natural resources, a characteristic orientation of productive forces, national economic specialization, the integrity of the reproductive process, etc. However, when defining a region, the authors proceed from the priority economic, production processes occurring on its territory, the population of the region is considered only as part of the productive forces, cultural, national-ethnic and many other features of the community of people living in this territory are not taken into account. Here, as clearly as possible, the main feature of the «socialist» interpretation of the economy is manifested: not an economy for a person, but a person for an economy.

The time has come to correct this greatest delusion, and this should be the purpose of the ongoing economic reforms in our country. One of the main reasons for the crisis situation in the Ukrainian economy and restraining the transition to established market relations is underestimation, and often simply ignorance of the territorial factor in socio-economic development. The stabilization

of the economic situation and the deepening of economic reforms are largely associated with the transfer of the burden of their implementation to the localities.

For effective scientific substantiation of radical economic transformations and the creation of a single economic space of Ukraine with the formation of regional and local markets, the development of local self-government, the creation of a regional complex of marketing research, it is necessary to increase the role, change the content, methodology and methods of research of the regional economy.

In recent decades, a new branch of scientific knowledge has developed and developed - the regional economy. The amount of scientific knowledge in this area has expanded, and a network of regional research centers has developed. In 2019, the Community and Territorial Development Council was created [13], and the plans for the most important scientific problems in the field of social sciences necessarily included the development of schemes for the development and distribution of productive forces, as well as other problems of the regional economy.

In the formation of this new branch of economic science, a significant contribution was made by the Council for the Study of the Productive Forces of Ukraine (created in 1934, which existed until 2010), and later – by the Institute of Economics of Environmental Management and Historical Development of the National Academy of Sciences of Ukraine. In particular, the scientists who formulated the very concept of «regional economy» and gave it a detailed justification were academicians O. Amosha, B. Burkinsky, M. Dolishny, M. Kizim, V. Simonenko, M. Khvesik.

As an object of the regional economy, socio-economic processes in the territory of the country, regions, districts and other territorial entities are usually considered in close connection with natural and ecological conditions. With a more in-depth study of the object, we are usually talking about the system of territorial units, considered in their relationship and interaction. Changes in the composition of the object and subject of the regional economy should cause certain modifications in the research methodology.

First of all, the approaches to formulating the goals of social and economic development are changing. Instead of providing an additional economic effect due to the optimal territorial organization of the economy, the creation of favorable conditions for the life and social well-being of the population of the regions is in the first place. This means, for example, that the approach to the population as one of the factors in the location of production should be rethought: the population should be considered not only and not so much as a source of labor resources, but above all the satisfaction of its needs should be put forward as the goal of developing the regional economy.

Since the level and quality of life of the population is determined not only by the economic sphere, but also by the degree of environmental safety, the possibilities for the development of national culture, the freedom to choose between new types of activity and the preservation of the traditional way of life, as well as a number of other circumstances. The criteria for rationalizing the distribution of productive forces are changing. Instead of a strict focus on maximum efficiency for the national economy, the following priorities can be:

- an increase in the standard of living, the degree of social well-being of the population and other social criteria that are not always of an economic nature;
- the size of the economic effect for a given territory, expressed in the form of an increase in either financial or material resources;
- the degree of environmental safety and maintenance of the balance of ecosystems;
- combating pandemics such as Ebola, SARS-Cov-2, etc.

Thus, the most important direction in the evolution of the methodology of regional economic research is the expansion of the range of factors taken into account, a fuller consideration of local characteristics, interests and needs of the population, as well as a multi-criteria approach to assessing the rationality of the development of the regional economy and the location of productive forces. Research and forecasting of the processes of formation of regional labor markets, housing, services, education and health care are completely new for the regional economy; financial problems of the territories, creation in the regional economy of the environment necessary for the development of commodity-money relations (formation of market infrastructure).

The list of regional research methods themselves also needs serious enrichment. The importance of the program-targeted method is increasing. Targeted programs are becoming one of the

central ways to manage regional development. The use of the balance method is significantly expanding in connection with the need to use financial balances, the development of employment balances, and increased requirements for the territorial balances of manufactured and consumed products.

The need for a more complete account of the various local conditions and interests of the population, the increasing requirements for the reliability of information, which sharply raise the question of conducting various kinds of special studies, population surveys. Based on the traditional system of statistical indicators, it is impossible to conduct a deep study of the specific features of the economic and social processes of the country's regions and districts of the region.

An increasingly widespread use of probabilistic methods and methods of expert assessment in forecasting regional development processes is becoming an urgent problem. This is connected both with the transition to civilizational market relations, and with the increased impact on the economy of social and environmental processes of a stochastic nature. The inclusion of our economy in the world economic system requires the use of foreign methods of regional research and experience in managing the territorial development of other countries.

The economic reform aimed at the formation of market relations introduces profound changes in the content and methods of analysis of socio-economic development, the preparation of the information necessary for this analysis. The new analysis system should be developed in accordance with modern requirements at all levels of government and economic management.

In the context of economic reforms and the actual transition to the market, the tasks of statistics arising from the requirements of the analysis of socio-economic development change significantly. If in a planned economy the development of statistics was mainly determined by the preparation of materials for the preparation of plans and control over their implementation, now the decisive place is taken by the study of the functioning of the economy in a market environment, the process of forming market relations in order to objectively assess the results of the reform, the policy of stabilizing the economy, debugging effective mechanism of market regulation. Accordingly, it becomes necessary to develop a number of new areas of economic analysis, to change its general methodology, including in the traditional areas that continue the previously established practice. In this regard, significant changes need to be made in the system used in the analysis of statistical indicators. They should, firstly, reflect the new processes taking place in the economy and, secondly, be built taking into account the modern organization of statistics (the gradual rejection of complete reporting, including in the public sector, the widespread use of sample studies and censuses, to counting a number of indicators).

In contrast to the existing practice, when the content side of economic analysis was predetermined by the composition of the available, in some cases randomly formed indicators, now it is advisable to implement a different approach to determining the system of indicators - to build it based on the directions and content of the analysis itself.

The development of a marketing research concept is aimed at:

- to present in an interconnected form the mechanism of functioning of the Ukrainian economy;
- proceeding from this, to form the main directions of analysis of the processes taking place in the economy;
- to determine the system of indicators necessary for such an analysis (such a system of indicators on the example of conducting marketing research on the development of the innovative potential of the regions of Ukraine by the authors is given in the sources [16, pp. 69-68]).
- The substantiation of such a system is essential for solving another equally important task – determining, taking into account the new conditions, modern approaches to organizing the entire system of statistical information in order to ensure:
- obtaining new indicators;
- changing, if necessary, the methodology for calculating the indicators used (this approach was used by the authors in the study of options for eliminating the industrial backwardness of the regions of the Ukrainian Black Sea region [15, pp. 105-121];

- information support of the needs of economic analysis in general;
- determination of principles for the further development of the statistical information system.

L. Nekrasova and A. Diskina in their work emphasize «the main goal of marketing strategic planning is to build activities on the territory of industrial enterprises in such a way as to organically and effectively combine production, meeting consumer needs, profit and regional development» [12, p. 114].

The development of the scheme assumes, along with the generalization of the previous statistical practice and methodology of economic analysis, a theoretical justification of the scheme being developed. In this regard, this work goes beyond the traditional framework of research and development in the field of statistics, comes into contact with the solution of a number of socio-economic problems of the transition period.

This circumstance introduces additional restrictions on the preparation of the analysis concept. The existing domestic theory of the economy, the transition period and, moreover, the market theory does not exist today, and it is unlikely that it will be created in the near future. Moreover, in modern conditions, none of the available versions of such theories can act as an official, state one. Most likely, it can be assumed that the ideas of various schools will compete in the domestic scientific space, just as in other developed countries, where the coexistence and development of monetarism and liberalism, on the one hand, Keynesianism and the theory of state regulation of the market, social development of society as a whole - on the other. In addition, in Ukraine, like other former socialist countries, the traditions and influence of Marxism are strong, and it would be a mistake to exclude the possibility of developing its theoretical heritage.

This hypothesis of the probable state of economic science leads to the following conclusions regarding the nature of the theoretical justification of the analysis scheme:

- firstly, it should proceed from the account of the current state of economic theory and be carried out within the framework that does not exceed the practical needs of the development of the named scheme;
- secondly, it could be limited to justifying a minimum of initial positions acceptable to supporters of various theories in the expectation that the development of the latter will be carried out outside the boundaries of the development of the analysis scheme, by other forces and at different times.

The subject of marketing research is the process of socio-economic development of society in its various aspects and interrelationships is the same as in other areas of economic statistics. The marketing research scheme is based on the existing industry statistics, the system of economic balances and models (the system of national accounts being created, the input-output balance and others), interacts with the already established and new directions of development of individual sections of statistics. At the same time, it expands the possibilities of system analysis of the process of socio-economic development and opens up a number of its new directions. The feasibility of developing a scheme is determined as follows. Separate branches of statistics have developed in many cases in isolation, without proper coordination with each other. In the context of the transition to the market, the need for a much greater integration of them increased, based on the requirements of reforms and a comprehensive analysis of the mechanism of the economy's functioning in a market environment. Especially should be strengthened financial statistics, the study of price dynamics, processes and the mechanism of inflation, foreign economic activity, a systematic analysis of the socio-economic development of territories.

Many of these tasks are solved by the development of the system of national accounts (SNA) in statistical practice. This work is, however, at an early stage and will take considerable time to complete. The SNA will not cover all analysis requests, since the bulk of the information it contains is developed on an annual basis, and only the main indicators are calculated by quarters and months. The current analysis of socio-economic development is carried out mainly on a monthly basis, and in some cases (prices, market conditions, finance, banking operations, etc.) - weekly and even daily.

In addition, the SNA mainly covers the macro level, only a few of its indicators have been brought to the meso level. The proposed analytical framework applies not only to the upper levels of the economy, but also to the community and enterprise levels.

The schematic diagram of the analysis is a new form of describing the process and mechanism of functioning of the entire economy, its conditions and results, applicable to any of its levels (Fig. 1).

In this sense, the scheme covers all available data sets, systems of economic balances and models, including the level of enterprises, determines the forms of using the relevant data in relation to the content side (areas of analysis), namely the study of forecasting and meeting the needs for goods and services.

Directions for analysis: dynamics of the national economy; solving social problems (including the fight against pandemics); inflation;

– development of industries; investments and scientific and technical level of production; regional development; financial position; foreign economic activity; economic reforms; economic security; the place of Ukraine and its regions in the world economy.

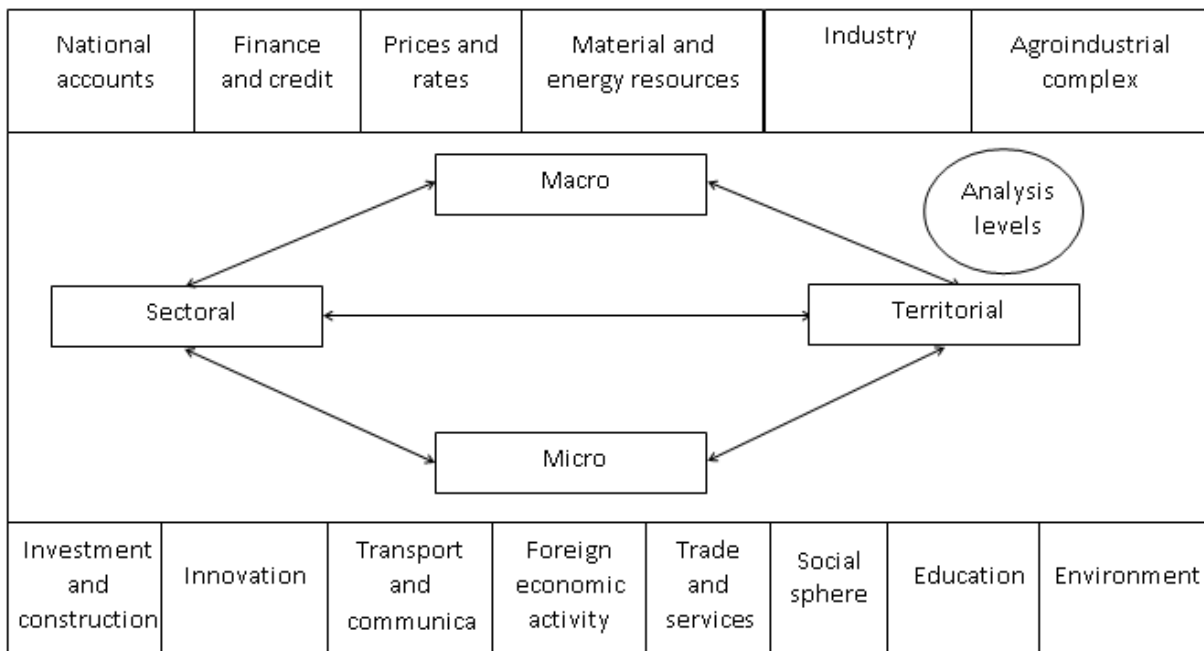


Fig. 1. Schematic diagram of the analysis of socio-economic development of the region

Deciphering the main directions in development at the regional level:

- dynamics and proportions of the national economy, the balance of its development;
- solving social problems, living standards of the region's population, balanced consumer market, demographic processes;
- inflation, price dynamics, financial circulation, hryvnia exchange rate;
- development of industries, demonopolization and restructuring of production, implementation of the most important regional development programs;
- investments, scientific and technological level, development of the production potential of the region;
- development of regions, their socio-economic situation;
- financial position of the regional economy, profitability, state of settlements, balance of budgets;
- foreign economic activity, export and import, interregional interaction;
- economic reform, the formation of a multi-structured economy, the formation of a market environment and infrastructure of the regional market.

Any of these problems can be studied independently, together with some other areas of analysis on a narrowed or complete list in a different combination of its individual areas. The choice of directions in each case will be determined by the tasks of the analysis, its scale and terms, which must be determined by the customer.

Analysis can be carried out, as shown by the arrows, both from above (from macroeconomics to industries, territories and enterprises) and from below. For a number of areas and problems in modern conditions, it seems more important to conduct such an analysis from below - from the enterprise to the industry (region) and macroeconomics, since reforms are concentrated, first of all, at the micro level, where, first of all, a market environment should be created.

The second level of analysis (industry, territory), in turn, can be detailed by highlighting in one case from large industries, separate subsectors and industries, in the second - by representing the regional division by districts and cities.

The above list of areas of analysis applies to all levels of the economy. If necessary, it can be disaggregated or expanded by disaggregating or detailing individual problems.

Separately, it should be said about the regional level of the marketing research scheme. Today, the importance of this area of economic analysis in connection with the unitary principle of state structure and organization of management, the delineation of competence (rights and responsibilities) of Ukraine and its subjects, the transfer of many management functions to the localities increases significantly [8; 9].

It is advisable to analyze the socio-economic development of territories based on the same approaches that were adopted when constructing the scheme. At the same time, it is necessary to take into account the peculiarities of the territorial analysis of development in comparison with the sectoral, macro- and microeconomic analysis. The composition of the blocks involved in analysis at the regional level can be somewhat reduced, as well as the number of indicators contained in such blocks (if necessary, additional indicators should also be included in the blocks). The territorial level of the scheme, like the sectoral one, in turn, is subject to concretization in relation to the tasks of socio-economic analysis in various levels of regional management, corresponding to the administrative-state structure. Here, if we go from below (from the enterprise), it is advisable to provide for the level of district and regional levels of management and analysis in accordance with the existing organizational structure of building state statistics bodies.

As the preparation of the general analysis scheme is completed and the regional section of its blocks is developed, the territorial statistical offices should be involved, whose participation will make it possible to more accurately determine the characteristics of the composition of indicators at the district and regional levels of analysis.

## **5. Conclusions**

The formation of a market economy in our country is associated with a change in priorities in regional socio-economic development. Maximizing the efficiency of the national economy through the optimal location of production is giving way to creating favorable conditions for the life and social well-being of the population. This means that the population should be considered not as one of the factors in the location of production and a source of labor resources, but primarily as meeting its needs, which should be put forward as the goal of developing the regional economy.

New priorities of socio-economic policy dictate changes in the content and methodology of the regional economy. It is necessary to shift attention from the location of productive forces and capital investments to the problems of social and economic development of territories, to take more into account the local characteristics of economic and social development, the ecological situation, national and demographic factors. At the same time, the directive establishment of production targets for the territory gives way to a variant study of possible development scenarios, and direct resource allocation - to the development of economic and legal levers of influence on the processes of investment and regional development.

Changes in the subject and content of the regional economy require an enrichment of the list of the methods of regional research themselves. The importance of target-oriented and balance-based methods is growing. The need to better take into account the various local conditions and interests of the population sharply raises the question of expanding the use of marketing research. In connection with the transition to civilized market relations, the influence on the regional economy of social and economic processes of a stochastic nature is increasing. In these conditions, the urgent problem is the



use of probabilistic methods in forecasting the processes of regional development, constructing scenarios of socio-economic development.

At present, the decisive place should be occupied by the study of the functioning of the economy in market conditions, in order to debug an effective mechanism of market regulation. Accordingly, there is a need to improve economic analysis, to change its general methodology. In this regard, the system of statistical indicators used in the analysis needs significant changes. They should, firstly, reflect new market processes in the economy and, secondly, be built taking into account the modern organization of statistics (transition from complete reporting to sample surveys). A schematic diagram of the analysis of socio-economic processes is proposed, which implies the unity of approaches to the analysis of various levels of the economy on the basis of a system of indicators specially developed for these purposes.

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**INSTITUTIONAL TRANSFORMATIONS AND  
EFFICIENCY OF THE AGRICULTURAL SECTOR OF UKRAINE**

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**Abstract:** *The article analyzes the essence, key components and the process of formation of the institutional environment, which began after the destruction of the planned-directive economy, and the formation of a market economy. In this context, the procedure for classification of business entities by main types of economic activity and their statistical accounting in the branches of primary production and industry for the production of food, beverages and tobacco products adopted in Ukraine is revealed in detail. The results of generalization of changes in the organizational structure of business entities under the influence of the formation of a holistic and balanced institutional environment from 2000 to the present are highlighted. Weak competitiveness, low efficiency and insufficient resistance to difficult conditions of such business structures as production cooperatives, state enterprises, farms and even personal farms have been established. At the same time, despite the increased exogenous and endogenous turbulence of the national economy, including the agricultural sector, private enterprises and other forms of economic activity were much more stable and even widespread, indicating their much higher adaptability to the market system. The role of agricultural holdings as an effective subject of concentration of dispersed resources of agriculture, especially land, as well as an effective intermediary for establishing direct links and development of integration processes between raw materials and processing industries to ensure the production of finished foods. The reasons for the prolonged entry of agriculture to the level of production in the base year and more than three times faster - the processing industry, as well as the role of factors that allowed much lower indicators of its economic efficiency compared to primary production.*

**Key words:** *institutional environment, organizational structure of entities, agriculture, food industry, types of economic activity, production efficiency*

**JEL Classification:** E02, Q15

**UDC:** 061.27: 338.439 (477)

## **1. Introduction**

Since Ukraine's political independence, the national economy has faced a difficult choice: to remain an important raw material appendage for the developed world or to find its own paradigm of development that will lead to a self-sufficient economic system that operates on an open economy. Thus, the economy of Ukraine, as an important component of the economic complex of the former union and closely connected with it by various ties, embarked on a path of deep transformations that were to ensure the transition from a planning and directive system to a market economy. In almost all of the 1990s, the foundations of the planned economy were destroyed and the primary elements and mechanisms of the market economy were created. In particular, there was privatization and privatization of state property and land unbundling and privatization of property of agricultural

enterprises. Privatization in agriculture has become the starting point for launching a series of successive processes that still have a turbulent impact on the development of various sectors of the national economy. The ties and trends in the development of agriculture and the food processing industry are especially strongly and deeply intertwined. They were very close in Soviet times, when the implementation of planned tasks was an indisputable priority and to achieve them, all possible levers of administrative influence for that period of time were used to overcome intersectoral obstacles. Among them the most important are: a significant imbalance between procurement prices for agricultural raw materials and wholesale and retail prices for finished food products; as a rule, the lack of common economic interests of agricultural producers and processors, and hence the discriminatory nature of economic relations between them; the dominant role of state property in relation to collective and individual, etc.

The change of forms of ownership in the early 1990s — state and collective to private, joint-stock, individual, and municipal — led to the creation of a new type of enterprise in the second half of the 1990s. At the same time, an appropriate institutional environment was formed in order to balance the interests of business entities of different organizational and legal forms and forms of ownership. At different periods of time, rapid changes in the institutional environment of the economy and the organizational structure of economic entities can either contribute to or inhibit the achievement of positive changes in the economic activity of business structures. Moreover, the lag of the structure of the institutional environment from the turbulences in its exogenous shell, which occur much faster, slow down the transformation processes and preserve the outdated organizational structure of the economy and its individual industries. Thus, it can slow down the positive trend and cause the deterioration of economic indicators of economic activity and socio-economic situation in the country, and in some cases - even direct its development towards destabilization.

## **2. The degree of study of the problem at present and the purpose of the study**

The issues of forming a holistic and balanced institutional environment and its impact on relations between organizations have been and are the subject of research by many well-known foreign and Ukrainian economists. Among them: T. Veblen, A. Hrytsenko, R. Kouz, Y. Lopatynskyi, O. Liakhovets, O. Molodtsov, D. Nort, K. Polani, O. Uiliamsen, O. Shpykuliak, E. Furubotn and R. Rikhter [1-11] and others.

The above and other scholars have studied the evolution of the structure of the components of the institutional environment over a long historical period, the impact of its perfection on the organizational structure of the economy and its individual sectors, as well as the reverse effect of abrupt transformations and progressive changes in technology and management methods. complementary institutes. At the same time, it was found that not any changes, especially abrupt ones, in particular in the transition from an administrative-planned to a market economy, can provide a positive impact on business in general and individual industries. This is due to the emergence of specific problems for the transition period, which in specific circumstances and times become turbulent and do not fit into the theoretically defined parameters. The point is that both permanently and spontaneously due to exogenous changes there are transformations in the institutional environment, which has its impact on the organizational structure of the economy, its intersectoral complexes and individual industries. Accordingly, the organizational structure of entrepreneurial formations in different industries has a diverse impact on the efficiency of economic activity of business entities. Thus, the purpose of our study is to establish the compliance of the existing in specific circumstances and for a certain period of time the institutional environment to the organizational structure of the agricultural sector and its impact on ensuring the achievement of expected performance and efficiency.

## **3. Applied research methods and materials**

They include a systematic analysis of changes in the institutional environment of the economy and its comparison with the process of transformation of the organizational structure of the agricultural sector, as well as assessing the impact of these changes on performance and economic indicators of

their economic activity. The study involved analytical materials and statistics on economic performance and efficiency since 2000 and until now.

#### 4. Obtained results and discussions

For further research, it is advisable to determine the starting point. For our conditions, it can be taken as the period of time when, in general, the main stage of privatization in agriculture was completed and the "bottom" of the agrarian crisis was passed. The practical implementation of measures to reform industrial relations in the 1990s resulted in the following: almost all collective and state-owned agricultural enterprises were radically reorganized and new ones were created on their basis, but on the basis of private ownership of the means of production, including land. It should be noted that the share of agricultural land, which in 1990 was state-owned (100%), decreased to 26.2% in the 1990s, and 73.8% became state-owned, respectively (more than 72% in private ownership). , collective - less than 1%) [12, p. 72-73]. Therefore, it is logical to accept the statistical reporting for 2000 as a starting point for assessing changes in the organizational structure of agriculture.

For further analysis, it is advisable to pay attention to the following. It is about the possibility of applying the ideas expressed by Douglas North in his report on the impact of institutional change on economic growth (March 1996), to assess the transition processes in Russia, the validity and direction of the measures taken. North drew attention to the situation when it is necessary to solve a triple problem, each face of which contradicts the other. The essence of this task is that, firstly, it is necessary to master changes and new mechanisms, secondly, to overcome the negative consequences of changes and mistakes and, finally, to preserve the valuable heritage of the past. Douglas North's position on this legacy seems reasonable and rational: regardless of your attitude to the past, you need to consider what people are used to. The strategy and tactics of reforms cannot ignore this. The basis of people's representation is not a single knowledge gained during the life of one person or one generation, but their amount accumulated over a long period "[13, p. 9].

Therefore, when designing the provisions expressed by D. Norton to analyze the situation in the agricultural sector of Ukraine on the impact of institutional changes on organizational structure and economic growth in transition, it is necessary to take into account the following. Practice has shown that there is no direct effect of institutional change on economic growth: the impact is complex, indirect and long-term. This is largely due to the fact that it includes not only institutions and organizations, but also individual producers (households). However, it is through the consciousness of individual and collective producers that the penetration of requirements and restrictions in force for a specific period of time, which are focused in institutions, and their implementation in the practice of multifaceted relations between actors (organizations).

According to D. Norton, institutions include all forms of restrictions, including formal (rules invented by people: constitutions, laws, regulations) and informal, or "unwritten" (conventional conventions and codes of conduct)... The concept of "organization" includes political bodies and institutions (political parties, Senate, city council, control agency), economic structures (firms, trade unions, family farms, cooperatives), public institutions (churches, clubs, sports associations) and educational institutions (schools, universities, vocational training centers). An organization is a group of people united by the desire to jointly achieve any goal.... Institutions influence the economic process by influencing the costs of exchange and production. Along with the applied technology, they determine the transaction and transformation (production) costs, which together constitute the total production costs [7, p. 18-21].

It should be noted *that the concept of institutional environment, which forms a set of institutions and institutions, has become commonplace today.*

The distinction between the two key concepts of "institutions and institutions" is that the former means a set of norms, rules, traditions that regulate relations between people in society, and institutions - are organizational formations, complexes of interaction of institutions designed to ensure compliance [14, p. 59]. The institutional environment concerns both the national economy and its crucial component, ie the agricultural sector. Its influence is prevented by the formation of institutions and is realized during the transformation processes by creating a rational spatial and organizational structure of business entities. Thus, we are talking about the *formation of institutional architecture of*

*the economy*, including the agricultural sector. Note that the authors consider institutional architecture as "a fundamental structure of institutions consisting of rules, norms, stereotypes, traditions, guidelines and other social formations in their relationship with the overall aesthetic plan for building a holistic social system" [2, p. 9]. In the integral socio-economic system of the agricultural sector there are **basic laws of architecture: the law of equilibrium, the law of the golden mean and the law of structuring** [2, p. 10]. The essence of the role and practical significance of each of the laws for economic development is revealed as follows:

- *the essence of the law of equilibrium*, in particular, is that all the elements of a holistic system move in the direction of rest relative to other elements or are in this state. This means that all elements of the construction of the agricultural sector must be changed and improved in such a way as to bring the whole system closer to a state of equilibrium in which it will function most effectively, ensuring the coherence of economic interests of all economic entities that form it;

- *the law of the golden mean gives* a spatial and quantitative characterization of the agricultural sector through the interaction of its homogeneous elements as a whole system that is in constant motion and integrates the action of all elements into a certain characteristic that reproduces the integrity of the system relative to other systems. This law allows to assess, for example, the average level of profitability (profitability) of individual segments (agricultural and agro-industrial production, processing, infrastructure, social sphere) and track their changes in space and time, which is important in analyzing the effectiveness of institutional changes in agriculture;

- *the law of structuring* characterizes the relationship of elements that have internal development factors and are able to unite into certain holistic formations and be structured within a broader integrity, which is important in the study of formation and development of the agricultural sector and synchronous institutionalization of change [15, p.23].

The formation of the institutional environment took place in the process of destruction of the administrative-planning system and the transition to a market economy. In particular, agrarian and land reforms were carried out in the agrarian sphere, but these processes were prevented and accompanied by the development, adoption and implementation of a large number of laws and regulations, as well as their impact (various types of state monitoring). According to the estimates of well-known scientists who were nominated for the State Prize of Ukraine in the field of science and technology in 2015, in 1991-2014, 61 Decrees of the President of Ukraine, 97 laws and resolutions of the Verkhovna Rada of Ukraine, 176 Decrees and resolutions of the Cabinet of Ministers. In the process of their practical implementation, 450 scientific and practical approbations were conducted (including 224 seminars and 76 conferences, 111 proposals were prepared by government agencies), 873 works were published (including 110 monographs and 68 methodological and practical recommendations and 625 scientific articles), and 246 dissertations were defended (76 of them were doctoral and 170 were candidate's) [16, p. 6-7].

The formation of the legal and regulatory framework for agrarian and land reforms is the activity of public authorities to create a set of necessary institutions, and in a broad sense - the development of a modern institutional environment. One of the possible directions of its influence and the practical implementation of which is the reason to consider the creation of modern organizational forms of management that best meet the current challenges and real conditions of economic activity.

Thus, due to the conformity of the structure and number of different organizational forms of economic activity to the institutional environment available for specific conditions and time, on the one hand, but on the other, while maintaining the synchronicity of changes in the institutional environment with economic transformations and influence of a number of other components and efficiency of production activity will be formed.

As for the agricultural sector, it is here that the efficiency of production depends very closely on a number of other factors, namely: the natural and climatic conditions of a particular area, the ratio between individual and corporate sectors, the share of agricultural land included in land banks of agricultural holdings, the level of mechanization and provision of skilled labor, etc. It is important to keep in mind that the efficiency of agriculture, the volume of production of food raw materials, largely depends on the provision of its capacity in the food processing industry, and hence its efficiency.

In Ukraine, in relation to the agricultural sector, ie agriculture and food processing, there are two state registers:

- **Register of AGRO** - producers of products and services related to economic activity, classified in **section A** (Agriculture, forestry and fisheries) **NACE-2010** [17];

- **Register by sections 10 + 11 + 12** (food production + beverage production + tobacco production) of **section C** (processing industry) Classification of economic activities (**NACE-2010**) [18].

It should be noted that **the objects of classification in the NACE** are the types of economic activity of legal entities, separate divisions of legal entities and natural persons-entrepreneurs (hereinafter - entities), which are grouped at the highest levels of classification in the industry. As the above-mentioned Registers differ significantly from each other, they reveal not only the differences between them and between the subjects of activity, but also the compliance of the organizational structure of different industries with the institutional environment of the agro-sphere in general.

In particular, **the AGRO Register includes three modules**: "Profile enterprises", "Non-core enterprises" and "Local units". Enterprises, depending on their activities, are divided into groups:

- **profile enterprises** - enterprises in which the Unified State Register of Enterprises and Organizations of Ukraine (abbreviated - **USREOU**) specifies the types of economic activity listed in section A "Agriculture, forestry and fisheries" **NACE-2010**. Section A is divided into three sections (01; 02; 03), which cover seven, four and two economic activities and the provision of various related services, respectively;

- **non-core enterprises** for which the USREOU does not specify the types of economic activity referred to in section A of the **NACE-2010**, but which carry out agricultural, hunting, forestry or fishery activities (designations respectively C, M, L, R) and meet the following conditions:

- 1) or own and / or use more than 1 hectare of agricultural land;
- 2) or kept at the beginning of the year: from 5 heads of cattle, or pigs, or sheep, or goats; from 3 heads of horses; from 200 birds; from 20 heads of fur animals, rabbits; from 5 bee families;
- 3) or carry out ancillary activities in agriculture and post-harvest activities;
- 4) or have in use hunting grounds;
- 5) or have forests in use;
- 6) or engaged in fishing and fish farming.

Statistical information on **non-core enterprises** is not singled out when calculating a number of indicators. This feature was allocated by the State Statistics Service of Ukraine for internal use (to form a set of surveyed enterprises) to cover all types of primary activities of enterprises in a given area. This affects the specifics of the organization and statistical study of the results of these activities, the number of products and services created in its process.

Regarding the legal status, **the units-enterprises of the AGRO Register are**, as a rule, legal entities or separate subdivisions of legal entities (branches); **local units** - production structural subdivisions of enterprises (*productions, branches, sections, brigades, etc.*) located outside the location of enterprises, without the status of legal entities, or separate subdivisions of legal entities (branches), but with certain economic and managerial powers and able to be potential respondents production, market statistics.

**Peculiarity of management** - a characteristic feature or a set of characteristic features, which distinguishes the enterprise (local unit) from the general population according to a certain criterion, emphasizes its (its) originality. For example, an enterprise (local unit) is the only producer of a certain type of product in a district, region, country (these include: cultivation of crops - 8 species; breeding of farm animals - 8 species).

**Profile activity** - economic activity of the enterprise by types of activity, which are referred to section A of **NACE-2010** (signs of profile activity and code: Agriculture - 1; Hunting - 2; Forestry - 3; Fisheries - 4; Not active - 0).

All of the above is included in **Part 1 of the "Enterprise" of the Register of AGRO**, and its **part II "Local Councils"** is designed to collect and accumulate generalized information about households with registration of residence in rural areas (**rural households**) - potential producers of

agricultural products. The carriers of this information are local councils, which are subordinated to rural settlements [17, p. 6-9].

Thus, *the AGRO Register* provides a statistical assessment of activities related to the use of natural resources, including land, plants and animals, as well as the use of biological transformation of living organisms, has its own organizational and economic features. size, legal status and organization, economic orientation and degree of integration of participants in the industry register due to specific criteria allows to take into account these participants, to study and make sets of potential respondents more adequate and manageable, and to control and observe phenomena occurring in the process economic activity of subjects [17, p. 4].

Since we are talking about the agricultural sector, it is appropriate to assess the "contribution" of each industry to the overall result. The statistical data and calculated indicators given in Table 1 are the basis for the conclusion that the analysis justifies the focus on only two key areas: agriculture and food processing, as the other two - forest (of which only - wildlife harvesting). non-timber products) and fisheries - the real contribution to the formation of food resources, compared with agriculture, together are less than 0.3%.

Table 1. Branches of the agricultural sector in the economy of Ukraine \* in 2018

| Types of economic activity                                    | The population is busy |              | Employees       |             | Fixed assets** |             | Production     |              | Added value    |             |
|---|------------------------|--------------|-----------------|-------------|----------------|-------------|----------------|--------------|----------------|-------------|
|   | thousand people        | %            | thousand people | %           | UAH million    | %           | UAH million    | %            | UAH million    | %           |
| 1   | 2                      | 3            | 4               | 5           | 6              | 7           | 8              | 9            | 10             | 11          |
| <b>Total for the national economy</b>                         | <b>16360,9</b>         | <b>100</b>   | <b>6959,9</b>   | <b>100</b>  | <b>7733905</b> | <b>100</b>  | <b>5626437</b> | <b>100</b>   | <b>2310581</b> | <b>100</b>  |
| Including   |                        |              |                 |             |                |             |                |              |                |             |
| <b>1. Primary production</b>                                  | <b>2937,6</b>          | <b>17,96</b> | <b>564,8</b>    | <b>8,11</b> | <b>341622</b>  | <b>4,42</b> | <b>600955</b>  | <b>10,68</b> | <b>201938</b>  | <b>8,74</b> |
| from it:  |                        |              |                 |             |                |             |                |              |                |             |
| - <b>agriculture, hunting and related services</b>            | <b>2871,5</b>          | <b>17,55</b> | <b>501,5</b>    | <b>7,21</b> | <b>335302</b>  | <b>4,34</b> | <b>579686</b>  | <b>10,30</b> | <b>191228</b>  | <b>8,28</b> |
| - forestry  | 34,8                   | 0,21         | 33,2            | 0,48        | 5115           | 0,07        | 20012          | 0,36         | 10340          | 0,45        |
| including harvesting wild non-wood products                   | н/д                    | -            | н/д             | -           | н/д            | -           | 53             | ...          | 30             | ...         |
| - fisheries   | 31,3                   | 0,19         | 30,1            | 0,43        | 1205           | 0,02        | 1257           | 0,02         | 370            | 0,02        |
| <b>2. Manufacture of food products, beverages and tobacco</b> | <b>322,7</b>           | <b>1,97</b>  | <b>321,5</b>    | <b>4,62</b> | <b>182445</b>  | <b>2,36</b> | <b>610374</b>  | <b>10,85</b> | <b>121658</b>  | <b>5,27</b> |

\* Compiled and calculated according to the State Statistics Service of Ukraine for 2018.

\*\* Statistics for 2017

Therefore, taking into account the above methodological approaches and practical proposals, we will assess the compliance of the organizational structure of agricultural production to the institutional environment available for specific circumstances and time period, which was formed in the process of agrarian and land reforms.

Taking into account 2000 as a point of transition from the already largely destroyed administrative-planning system to key market elements (private ownership of land and means of production, lack of state support for producers and employment guarantees, etc.) and on this basis, taking into account the realities of the time, theoretical knowledge and practical ideas about the effective development of agriculture, there was a formation of the organizational structure of agricultural production (Table 2). The extent to which it corresponded to the institutional environment at the time can only be verified over time, ie by comparing it with the corresponding structure, which transformed over the next 18 years and led to significant changes.

The analysis suggests that under the influence of various circumstances, including increased endogenous turbulence, weak competitiveness of new business structures, low or unprofitable efficiency, the spread of destructive demographic processes and complex and contradictory conditions of formation and market environment in the organizational structure. In particular, the segments of production cooperatives (four times) and state-owned enterprises (almost twice), as well as farms (every seventh-



eighth of them ceased to exist after 2000). Also, even with the spread of mass unemployment in rural areas, the segment of personal farms has narrowed significantly (almost a quarter), mainly due to those who were unable to provide full employment in the economically active age.

Table 2. Structure and dynamics of existing agricultural enterprises (SGP) by organizational and legal forms of management \* and personal farms (OSG) in 2000-2018 \*\* at the end of the year; units; %

| Forms of economic gift<br>(units / interest) | Periods by years: |        |        |        |        |        |        |        |         |        | 2018<br>to<br>2000,<br>%; |
|--|-------------------|--------|--------|--------|--------|--------|--------|--------|---------|--------|---------------------------|
|  | 2000              | 2005   | 2008   | 2010   | 2013   | 2014   | 2015   | 2016   | 2017*** | 2018   |                           |
| 1  | 2                 | 3      | 4      | 5      | 6      | 7      | 8      | 9      | 10      | 11     | 12                        |
| I. Total PF, of them:                        | 51588             | 57858  | 59059  | 56493  | 49046  | 46199  | 45379  | 47697  | 45558   | 49208  | 95,4                      |
|  | 100               | 100    | 100    | 100    | 100    | 100    | 100    | 100    | 100     | 100    | X                         |
| Business associations                        | 6718              | 7545   | 7879   | 7769   | 8245   | 7750   | 7721   | 8700   | 6967    | t/d    | 100,8                     |
|  | 13,0              | 13,0   | 13,3   | 13,8   | 16,8   | 16,8   | 17,0   | 18,2   | 15,3    | t/d    | +2,3                      |
| Private companies                            | 2519              | 4112   | 4326   | 4243   | 4095   | 3772   | 3627   | 3752   | 3215    | t/d    | 127,6                     |
|  | 4,9               | 7,1    | 7,3    | 7,5    | 8,4    | 8,2    | 8,0    | 7,9    | 7,1     | t/d    | +2,2                      |
| Production cooperatives                      | 3136              | 1373   | 1101   | 952    | 809    | 674    | 596    | 738    | 448     | 735    | 23,4                      |
|  | 6,1               | 2,4    | 1,9    | 1,7    | 1,6    | 1,5    | 1,3    | 1,5    | 1,0     | 1,5    | -4,6                      |
| Farms  | 38428             | 42932  | 43894  | 41726  | 34168  | 33084  | 32303  | 33682  | 34137   | 33164  | 86,3                      |
|  | 74,5              | 74,3   | 74,4   | 73,8   | 69,8   | 71,5   | 71,2   | 70,6   | 74,9    | 67,4   | -7,1                      |
| State enterprises                            | 385               | 371    | 354    | 322    | 269    | 228    | 241    | 222    | 199     | t/d    | 51,7                      |
|  | 0,7               | 0,6    | 0,6    | 0,6    | 0,4    | 0,5    | 0,5    | 0,5    | 0,4     | t/d    | -0,3                      |
| Enterprises of other forms of management     | 402               | 1525   | 1505   | 1481   | 1460   | 691    | 891    | 603    | 592     | t/d    | 147,3                     |
|  | 0,8               | 2,6    | 2,5    | 2,6    | 3,0    | 1,5    | 2,0    | 1,3    | 1,3     | t/d    | +0,5                      |
| II. PF (thousands)                           | 5200,0****        | 4915,3 | 4666,0 | 4540,4 | 4241,6 | 4136,8 | 4108,4 | 4075,2 | 4031,7  | 3975,1 | 76,5                      |
| Certificate:                                 |                   |        |        |        |        |        |        |        |         |        |                           |
| Share of PF products. in%                    | 38,4              | 40,5   | 46,0   | 48,3   | 54,0   | 55,3   | 55,1   | 57,0   | 56,4    | 58,8   | +20,4                     |

\* Legal entities and their separate subdivisions engaged in activities related to the cultivation of annual, biennial and perennial crops, plant reproduction, animal husbandry, mixed agriculture and ancillary activities in agriculture and post-harvest activities

\*\* Compiled and calculated according to the statistical collections "Agriculture of Ukraine" for the respective years.

\*\*\* As of November 1, 2017, legal entities and their separate divisions, for which the main activity was the cultivation of annual, biennial and perennial crops, plant breeding, animal husbandry, mixed agriculture and ancillary activities in agriculture and post-harvest activities (including farms regardless of the main activity).

\*\*\*\* Determined by calculation.

P.S: t/d - there is no data.

At the same time, even taking into account the increased exogenous and endogenous turbulence in the national economy, and especially in its agricultural sector, private enterprises proved to be extremely stable and very competitive, with almost 28% increased and the segment of other enterprises expanded 1.5 times (joint with foreign legal entities, family, collective, etc.). And this despite the fact that due to the illegal occupation of the Autonomous Republic of Crimea and some districts of Donetsk and Luhansk regions, in 2014, compared to the previous year, the total number of agricultural enterprises decreased by 5.8% (by more than 2.8 thousand units) and this, in turn, left an imprint on almost all components. The most stable was and remains the segment of business associations, ie former collective agricultural enterprises, which managed to significantly preserve the material base created in the pre-reform period, arable land and labor collectives.

However, on the downward trend of the segment of economic entities in general in primary production, including agriculture and fisheries (Table 3), there was an increase in their number in the following groups: cultivation of perennial crops (twice: more than 2.4 thousand mainly due to micro-enterprises - up to 10 employees), mixed agriculture (one and a half times: almost up to 1.6 thousand, mainly due to micro-enterprises), harvesting of wild non-wood products (almost twice: up to 466 units, but mainly due to micro-enterprises that were created PE).

Table 3. Dynamics and structure of large, medium, small and micro enterprises by types of economic activity \*, units

| Types of economic activity and their codes                                      | Years, % (2018 to 2010) | Number of business entities (total and by business groups): |             |             |              |                |  |             |              |                  |
|---|-------------------------|---|-------------|-------------|--------------|----------------|--|-------------|--------------|------------------|
|   |                         | Entrepreneurs (E) by groups:                                |             |             |              |                | From them physical persons-entrepreneurs (PE) on groups: |             |              |                  |
|   |                         | Total E   | including:  |             |              |                | Total PE   | including:  |              |                  |
|   |                         |   | great       | average     | small        | of which micro |  | average     | small        | of which micro - |
| 1   | 2                       | 3   | 4           | 5           | 6            | 7              | 8  | 9           | 10           | 11               |
| <b>Total</b>  | <b>2010</b>             | <b>80321</b>  | <b>13</b>   | <b>3445</b> | <b>76863</b> | <b>72421</b>   | <b>29655</b>   | <b>5</b>    | <b>29650</b> | <b>29449</b>     |
|   | <b>2018</b>             | <b>76328</b>  | <b>23</b>   | <b>2307</b> | <b>73998</b> | <b>68492</b>   | <b>25824</b>   | <b>9</b>    | <b>25815</b> | <b>25585</b>     |
|   | <b>%</b>                | <b>95,0</b>   | <b>177</b>  | <b>67,0</b> | <b>96,3</b>  | <b>94,6</b>    | <b>87,1</b>  | <b>180</b>  | <b>87,1</b>  | <b>86,9</b>      |
| <b>- Agriculture, forestry and fisheries (A)</b>                                | <b>2010</b>             | <b>72697</b>  | <b>13</b>   | <b>3078</b> | <b>69606</b> | <b>65529</b>   | <b>23637</b>   | <b>3</b>    | <b>23634</b> | <b>23510</b>     |
|   | <b>2018</b>             | <b>69596</b>  | <b>23</b>   | <b>1988</b> | <b>67585</b> | <b>62505</b>   | <b>20943</b>   | <b>5</b>    | <b>20938</b> | <b>20851</b>     |
|   | <b>%</b>                | <b>95,7</b>   | <b>56,5</b> | <b>64,6</b> | <b>97,1</b>  | <b>95,4</b>    | <b>88,6</b>  | <b>60,0</b> | <b>88,6</b>  | <b>88,7</b>      |
| <b>- Agriculture, hunting and related service activities (01)</b>               | <b>2010</b>             | <b>72697</b>  | <b>13</b>   | <b>3078</b> | <b>69606</b> | <b>65529</b>   | <b>23637</b>   | <b>3</b>    | <b>23634</b> | <b>23510</b>     |
|   | <b>2018</b>             | <b>69596</b>  | <b>23</b>   | <b>1988</b> | <b>67585</b> | <b>62505</b>   | <b>20943</b>   | <b>5</b>    | <b>20938</b> | <b>20851</b>     |
|   | <b>%</b>                | <b>95,7</b>   | <b>56,5</b> | <b>64,6</b> | <b>97,1</b>  | <b>95,4</b>    | <b>88,6</b>  | <b>60,0</b> | <b>88,6</b>  | <b>88,7</b>      |
| <b>- cultivation of annual and biennial crops (01.1)</b>                        | <b>2010</b>             | <b>57521</b>  | <b>6</b>    | <b>2120</b> | <b>55395</b> | <b>52364</b>   | <b>13380</b>   | <b>2</b>    | <b>13378</b> | <b>13312</b>     |
|   | <b>2018</b>             | <b>54812</b>  | <b>17</b>   | <b>1521</b> | <b>53274</b> | <b>48987</b>   | <b>12393</b>   | <b>3</b>    | <b>12390</b> | <b>12347</b>     |
|   | <b>%</b>                | <b>95,3</b>   | <b>28,3</b> | <b>73,1</b> | <b>96,2</b>  | <b>93,6</b>    | <b>92,6</b>  | <b>150</b>  | <b>92,6</b>  | <b>92,8</b>      |
| <b>- cultivation of perennial crops (01.2)</b>                                  | <b>2010</b>             | <b>1228</b>   | <b>0</b>    | <b>119</b>  | <b>1109</b>  | <b>1021</b>    | <b>710</b>   | <b>0</b>    | <b>710</b>   | <b>700</b>       |
|   | <b>2018</b>             | <b>2434</b>   | <b>0</b>    | <b>68</b>   | <b>2366</b>  | <b>2249</b>    | <b>1074</b>  | <b>1</b>    | <b>1073</b>  | <b>1068</b>      |
|   | <b>%</b>                | <b>198,2</b>  | <b>-</b>    | <b>57,1</b> | <b>213,3</b> | <b>220,3</b>   | <b>151,3</b>   | <b>-</b>    | <b>151,1</b> | <b>152,6</b>     |
| <b>- reproduction of plants (01.3)</b>  | <b>2010</b>             | <b>400</b>  | <b>0</b>    | <b>7</b>    | <b>393</b>   | <b>368</b>     | <b>323</b>   | <b>0</b>    | <b>323</b>   | <b>316</b>       |
|   | <b>2018</b>             | <b>411</b>  | <b>0</b>    | <b>2</b>    | <b>409</b>   | <b>380</b>     | <b>257</b>   | <b>0</b>    | <b>257</b>   | <b>256</b>       |
|   | <b>%</b>                | <b>102,8</b>  | <b>-</b>    | <b>28,6</b> | <b>104,1</b> | <b>103,3</b>   | <b>79,6</b>  | <b>-</b>    | <b>79,6</b>  | <b>81,0</b>      |
| <b>- Livestock (01.4)</b>   | <b>2010</b>             | <b>5170</b>   | <b>6</b>    | <b>771</b>  | <b>4393</b>  | <b>3786</b>    | <b>2610</b>  | <b>0</b>    | <b>2610</b>  | <b>2598</b>      |
|   | <b>2018</b>             | <b>4406</b>   | <b>6</b>    | <b>335</b>  | <b>4165</b>  | <b>3796</b>    | <b>2185</b>  | <b>0</b>    | <b>2185</b>  | <b>2177</b>      |
|   | <b>%</b>                | <b>85,2</b>   | <b>100</b>  | <b>43,5</b> | <b>94,8</b>  | <b>100,3</b>   | <b>83,7</b>  | <b>-</b>    | <b>83,7</b>  | <b>83,8</b>      |
| <b>- mixed agriculture (01.5)</b>   | <b>2010</b>             | <b>1012</b>   | <b>0</b>    | <b>2</b>    | <b>1010</b>  | <b>966</b>     | <b>633</b>   | <b>0</b>    | <b>633</b>   | <b>627</b>       |
|   | <b>2018</b>             | <b>1576</b>   | <b>0</b>    | <b>10</b>   | <b>1566</b>  | <b>1481</b>    | <b>529</b>   | <b>0</b>    | <b>529</b>   | <b>527</b>       |
|   | <b>%</b>                | <b>155,7</b>  | <b>-</b>    | <b>500</b>  | <b>155,0</b> | <b>153,3</b>   | <b>83,6</b>  | <b>-</b>    | <b>83,6</b>  | <b>84,1</b>      |
| <b>- activities auxiliary to agriculture and post-harvest activities (01.6)</b> | <b>2010</b>             | <b>7027</b>   | <b>1</b>    | <b>58</b>   | <b>6968</b>  | <b>6749</b>    | <b>5970</b>  | <b>1</b>    | <b>5969</b>  | <b>5946</b>      |
|   | <b>2018</b>             | <b>5418</b>   | <b>0</b>    | <b>51</b>   | <b>5367</b>  | <b>5213</b>    | <b>4489</b>  | <b>1</b>    | <b>4488</b>  | <b>4460</b>      |
|   | <b>%</b>                | <b>77,1</b>   | <b>0</b>    | <b>87,9</b> | <b>77,0</b>  | <b>77,2</b>    | <b>75,2</b>  | <b>100</b>  | <b>75,2</b>  | <b>75,0</b>      |
| <b>- hunting, trapping and related service activities (01.7)</b>                | <b>2010</b>             | <b>339</b>  | <b>0</b>    | <b>1</b>    | <b>338</b>   | <b>275</b>     | <b>11</b>  | <b>0</b>    | <b>11</b>    | <b>11</b>        |
|   | <b>2018</b>             | <b>439</b>  | <b>0</b>    | <b>1</b>    | <b>438</b>   | <b>399</b>     | <b>16</b>  | <b>0</b>    | <b>16</b>    | <b>16</b>        |
|   | <b>%</b>                | <b>77,2</b>   | <b>-</b>    | <b>100</b>  | <b>129,6</b> | <b>145,1</b>   | <b>145,4</b>   | <b>-</b>    | <b>145,4</b> | <b>145,4</b>     |
| <b>1</b>  | <b>2</b>                | <b>3</b>  | <b>4</b>    | <b>5</b>    | <b>6</b>     | <b>7</b>       | <b>8</b>   | <b>9</b>    | <b>10</b>    | <b>11</b>        |
| <b>- forestry and logging (02)</b>  | <b>2010</b>             | <b>3315</b>   | <b>0</b>    | <b>326</b>  | <b>2989</b>  | <b>2785</b>    | <b>2449</b>  | <b>1</b>    | <b>2448</b>  | <b>2405</b>      |
|   | <b>2018</b>             | <b>3422</b>   | <b>0</b>    | <b>304</b>  | <b>3118</b>  | <b>2790</b>    | <b>2439</b>  | <b>3</b>    | <b>2436</b>  | <b>2311</b>      |
|   | <b>%</b>                | <b>103,2</b>  | <b>-</b>    | <b>93,2</b> | <b>104,3</b> | <b>100,2</b>   | <b>99,6</b>  | <b>300</b>  | <b>99,5</b>  | <b>96,1</b>      |
| <b>1</b>  | <b>2</b>                | <b>3</b>  | <b>4</b>    | <b>5</b>    | <b>6</b>     | <b>7</b>       | <b>8</b>   | <b>9</b>    | <b>10</b>    | <b>11</b>        |
| <b>- harvesting of wild non-wood products (02.3)</b>                            | <b>2010</b>             | <b>252</b>  | <b>0</b>    | <b>6</b>    | <b>246</b>   | <b>237</b>     | <b>211</b>   | <b>1</b>    | <b>210</b>   | <b>209</b>       |
|   | <b>2018</b>             | <b>466</b>  | <b>0</b>    | <b>1</b>    | <b>465</b>   | <b>462</b>     | <b>437</b>   | <b>1</b>    | <b>436</b>   | <b>436</b>       |
|   | <b>%</b>                | <b>184,9</b>  | <b>-</b>    | <b>16,7</b> | <b>189</b>   | <b>195</b>     | <b>207</b>   | <b>100</b>  | <b>207,6</b> | <b>208,6</b>     |
| <b>- fishery (03)</b>   | <b>2010</b>             | <b>4309</b>   | <b>0</b>    | <b>41</b>   | <b>4268</b>  | <b>4107</b>    | <b>3569</b>  | <b>1</b>    | <b>3568</b>  | <b>3534</b>      |
|   | <b>2018</b>             | <b>3310</b>   | <b>0</b>    | <b>15</b>   | <b>3295</b>  | <b>3197</b>    | <b>2442</b>  | <b>1</b>    | <b>2441</b>  | <b>2423</b>      |
|   | <b>%</b>                | <b>76,8</b>   | <b>-</b>    | <b>36,6</b> | <b>77,2</b>  | <b>77,8</b>    | <b>68,4</b>  | <b>100</b>  | <b>68,4</b>  | <b>68,6</b>      |

\* Compiled and calculated by: Number of large, medium, small and micro enterprises by type of economic activity in 2010-2018. URL: [https://ukrstat.org/uk/operativ/menu/menu\\_u/size\\_20.htm](https://ukrstat.org/uk/operativ/menu/menu_u/size_20.htm).

Thus, the formation of the organizational structure of agricultural entities at the stage of transition to the market was mainly by trial and error. However, over time, the practice made significant adjustments to the structure of enterprises, as well as the corresponding improvement of the institutional environment. Moreover, the processes took place both sequentially and in parallel, but with a certain shift in time, and in addition, often the real practice even preceded the creation of the appropriate legal field. This was due to the practice of supporting the development of a new macroeconomic system, on the one hand, the urgent need to expand and strengthen the institutional (regulatory) infrastructure of the market for the active introduction of new economic relations at all levels: between businesses (actors), with the state, with actors external environment; on the other hand, - initiating the formation and development of the regulatory framework for safety and quality infrastructure and the implementation of its requirements for agricultural products, which were put forward by market surveillance authorities of EU member states and other international organizations.

Thus, both the institutional environment and the organizational structure of agricultural entities have been and continue to be in constant motion, ie rapid internal changes under the influence of both the requirements of effective development of the industry and due to various transformations in the external environment. But one of the most powerful catalysts for influencing the development of agriculture has been, is and will be the food processing industry.

Food and processing enterprises are a key link in the agri-food chain, as they provide processing of primary raw materials coming from agricultural producers and production of finished food products that enter the trade network or are sent for export. In the transition from the planning and directive system to a socially oriented model of market economy, it has been significantly transformed. In particular, as new forms of ownership emerged, this led to the emergence of new organizational forms of entrepreneurial activity and organizational and production forms of management. In the context of the above-mentioned changes, several stages of reforming property relations in the processing and food industry of Ukraine have been identified (Table 4).

Table 4. The main stages of reforming property relations in the food industry of independent Ukraine  
\* and the entry of agricultural enterprises into global markets

| № | Stage   | Characteristics of the stage   |
|---|---|--|
| 1 | Transition<br>(1992-1995)   | Ownership structure,%: state - 88.6; collective - 8.7; cooperatives for the production of goods and services - 1.5; property of citizens - 1.2   |
| 2 | 1995-1999   | According to the Decree of the Cabinet of Ministers of Ukraine and the Law of Ukraine "On Peculiarities of Privatization of Property in the Agro-Industrial Complex" of 17.05.1995, 90% of state-owned food industry enterprises were transformed into joint-stock companies and, first of all, enterprises with fast capital turnover (brewery, non-alcoholic )   |
| 3 | 1999-2002   | Full privatization of oil and fat, tobacco, confectionery, beer and soft drinks, canning, pasta, grain processing enterprises and enterprises of the corporation "Baby Food". By the end of 2002, no more than 3% of enterprises remained in the public sector   |
| 4 | 2002-2005 pp.   | Completion of the restructuring of the institutional structure of food enterprises and organizations and the globalization of private property. Dominance of private ownership (over 90%)  |
| 5 | 2005-2014 pp.   | Increasing competition in the market. Attracting foreign capital. Introduction of mechanisms of corporate social responsibility  |
| 6 | From 2014 to the present  | Reforming standardization and certification of products, adaptation to the requirements of world standards, in particular the EU   |
| 7 | Final period: introduction of techno-regulatory and veterinary-sanitary | Implementation of HACCP and ongoing procedures based on the principles and requirements of HACCP, in enterprises and farms of the food industry, increasing the number of participants (up to 200 IE at the beginning of 2020) and exports of agricultural products (over 22.1 billion. USD in 2019) and integration of agribusiness entities (153 IE at the end of 2019) into the internal market of the European Union |

\* Supplemented and adapted by O. Varchenko, D. Krysanov and K. Tkachenko using the source [19, p. 64].

Note that the key condition for the institutional transformation of food and processing industry (then it was called) was the privatization and privatization of property by labor collectives, as well as the transfer of ownership of agricultural producers 51% of the shares of privatized food companies. But, on the one hand, this led to a large degree of monopolization of the food industry (especially in tobacco, brewing, production of juices and soft drinks), and on the other - caused a lack of interest of farmers to ensure proper quality of food raw materials [20, p. 9]. Thus, the transformation or transition period began approximately in the mid-1990s and lasted until the early 2000s: this is evidenced by the systematization of organizational and legal forms of economic activity, which was published in 1994 in SC 002-94 [21]. Note that in 2000 in the food and processing industry there were 3103 large and medium and 6651 small enterprises [22, p. 222-225], and together amounted to 9754 business entities.

In the updated version of the State Classifier SC 002: 2004 [23] it is established that the *organizational and legal form of management* is a form of economic (including business) activity

with the appropriate legal basis, which determines the nature of relations between founders (participants), property regime responsibilities for the obligations of the enterprise (organization), the order of creation, reorganization, liquidation, management, distribution of profits, possible sources of financing, etc. The following basic and transitional (dying) forms of management are allocated: 1) **Enterprises** (15 subspecies, from them - 5 dying out, ie new such subspecies are not created and are not registered); 2) **Business Associations** (JSC - respectively 10 and 2); 3) **Cooperatives** (8 and 2); 4) **Organizations (institutions, establishments)**, (9 and 2); 5) **Associations of enterprises** (legal entities), (7 and 0); 6) **Separate Subdivisions** without the status of a legal entity (2 and 0); 7) **Associations of citizens, trade unions, charitable organizations, and other similar organizations** (12 and 0); 8) Other organizational and legal forms (respectively 9 and 1).

Later, SC 002: 2004 Classification of organizational and legal forms of management (COLFM) introduced the necessary changes and clarifications for the appropriate identification of the needs of practice. This, in turn, led to changes in the number and structure of organizational and legal forms of management, ie abolished obsolete, legalized and acquired "citizenship rights" new organizational forms of economic activity, as well as clarified their essence in accordance with new requirements.

According to the definition of NACE-2005 [23], which since 2014 has replaced NACE-2010 [24], the main statistical units in Ukraine are **enterprise** (legal unit, which always consists of one or more units of local units) **and local unit** (enterprise or its part, located in a geographically defined place and dependent on only one enterprise), which are identified in the USREOU. Considering the production in the form in which it is organized, **allocate a unit by type of economic activity (UTEA)**, which combines the homogeneous activities of the enterprise at the level of the NACE subclass and is not identified in the USREOU separately.

In the process of privatization and completion of privatization of property by labor collectives, the "outer shell" of the food industry changed dramatically, ie, legally new organizations were created that were identical in name or close to their predecessors. At the same time, all constituent documents were issued to new owners, co-owners and / or shareholders. But the internal organizational and production units (main shops and auxiliary sections, infrastructure components, transport and logistics) with the available material and technical base and manpower of enterprises that technologically ensured their operation, remained unchanged and only eventually transformed according to new production tasks. or due to a decrease in the degree of occupancy of existing facilities with food raw materials.

In the process of privatization, the transfer of state property to the labor collectives of enterprises took place by the method of voucher privatization or corporatization. In addition, privatization objects were sold at auctions, tenders and stock exchanges. As a result of privatization, the owners of the vast majority of enterprises became labor collectives and domestic shareholders who bought shares at their own expense. At the same time, foreign investors bought a significant part of the shares at tenders and auctions to acquire the most profitable food processing facilities. Later, the acquisition of the balance of those shares that were owned by minority shareholders was provided in various ways, and then the capacity acquired the status of enterprises with foreign investment. This applied mainly to enterprises producing tobacco products, beverages, vegetable oils, dairy products, and others. Enterprises with foreign investment were in a better economic position as they were subsidiaries of multinational food corporations. On the one hand, it simplified the implementation of innovations that have already been developed and tested abroad in domestic enterprises, and on the other hand, it allowed and allows to use the distribution network and logistics of the parent company to sell products produced in Ukraine abroad.

However, most enterprises in the process of privatization did not receive additional preferences and therefore developed on the existing material and technical base and their own investment opportunities. Since the statistics of enterprises by organizational and legal forms are conducted only at the level of individual or group sections, in particular industry (B + C + D + E), to allocate three sections (10 + 11 + 12) "Manufacture of food products, beverages and tobacco products", or almost every eighth company, is not possible and not appropriate. This is explained by the fact that in the process of integration of technologically related business entities based on different

forms of ownership, it is possible to create extremely complex (or conglomerate) both organizational and legal forms of management and forms of ownership, which still do not even managed to systematize.

In this context, it is appropriate to indicate the "primary" or generic forms of ownership, on the basis of which new organizational and legal forms of management have been created and are being created. For the first time the right of ownership and forms of ownership [25] was legally enshrined in Ukraine in early 1991: private, collective, state, as well as the principle of equality of all forms of ownership.

Later, codes were developed and provided and the following forms of ownership were identified: 10 Private property; 20 Collective property; 30 State property (with separation: 31 National property and 32 Communal property); 40 Property of other states; 50 Property of international organizations and legal entities of other states. These forms of ownership have become sustainable and have become entrenched in the legal and regulatory environment and in practice.

Thus, in the first half of the 2000s, with the completion of the legal framework for the privatization of property in the public sector, including the food processing industry, and its privatization, the necessary institutional environment was created and on this basis the restructuring of institutional and organizational structure of food industry enterprises.

In connection with the transition to the international system of accounting and statistics, the *classification of economic activities* (NACE) was developed on the basis of the international statistical classification of activities of the European Union. According to DK 009: 2010 [24], *the objects of classification* in the NACE are the types of *economic activity of legal entities*, separate divisions of legal entities and natural persons - entrepreneurs (hereinafter - entities), which are grouped at the highest levels of classification in the industry. Let's reveal the essence of these concepts.

**Economic activity** - the process of production (goods and services), which is carried out using different resources: raw materials, equipment, labor, technological processes and more. It is characterized by processes and costs of production and production.

**Processing is a technological process**, the implementation of which changes the shape, properties or composition of raw materials, semi-finished products or, in some cases, finished products, to obtain new products.

**The main type of economic activity** is a defining feature of formation and stratification of sets of statistical units for conducting state statistical observations. State bodies statistics calculate the main type of economic activity on the basis of these observations in accordance with the statistical methodology based on the results of enterprises for the year. **The main** among several activities is the type of economic activity of the entity, **which accounts for the largest contribution to gross value added** (or other defined criterion).

The food processing industry, on the one hand, is an integral part of the industry as a whole, and on the other hand, is the core of the food complex, as primary production products are raw materials for the food processing industries. The very name of the industry - the production of food, beverages and tobacco products - in a concentrated form summarizes the main types of economic activity. According to SC 009: 2010 [24], the food industry processes crop, livestock or fishery products into food and beverages for human or animal consumption, including the production of various non-food intermediates.

Structural changes due to changes in the demographics of enterprises (born / died - ie, new / removed for various reasons from the administrative register - business entities) in the 2010s and in the main types of economic activity are given in Table. 5.

Analysis of changes in the contingent by different types of economic activity shows that the reduction of entities in the food processing industry was relatively lower than in the processing industry, industry in general and 18 sections (ie, with the exception of three sections: O (Public Administration and defense; compulsory social insurance); T (Activities of households); U (Activities of extraterritorial organizations and bodies);), or almost all NACE 009: 2010 (Table 5): respectively for the period 2010-2018. in%) 89.7; 81.0; 82.8 and 84.2 (ie decreased by: 10.3; 19.0; 17.2 and 15.8 percentage points, respectively). Indicators differ even more by group of individual entrepreneurs

(in%): 91.2, respectively; 77.7; 78.2 and 82.2 (decreased by: 8.8; 22.3; 21.8 and 17.8 percentage points). This indicates not only the increased stability of food processing enterprises, but also their higher density and proximity to producers of raw materials and consumers of food products, as well as real opportunities for the organization of new medium and small businesses.

Table 5. Dynamics of business entities by types of economic activity \*, units

| Codes and activities   | 2010           | 2013           | 2014           | 2016           | 2017           | 2018           | 2018 to 2010=% |
|--|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 1  | 2              | 3              | 4              | 5              | 6              | 7              | 8              |
| <b>Total for NACE SC 009: 2010</b>   | <b>2183928</b> | <b>1722070</b> | <b>1932161</b> | <b>1865530</b> | <b>1805059</b> | <b>1839593</b> | <b>84,2</b>    |
| <b>of them in PE</b>   | <b>1805118</b> | <b>1328743</b> | <b>1591160</b> | <b>1559161</b> | <b>1466803</b> | <b>1483716</b> | <b>82,2</b>    |
| Industry (B + C + D + E)   | 151969         | 121244         | 131491         | 127069         | 123876         | 125859         | 82,8           |
| of them in PE  | 104142         | 72114          | 89304          | 88514          | 81850          | 81434          | 78,2           |
| Processing industry (C)  | 143012         | 111901         | 123108         | 118527         | 114773         | 115949         | 81,0           |
| of them in PE  | 101794         | 70502          | 87230          | 86092          | 79576          | 79087          | 77,7           |
| <b>Manufacture of food products, beverages and tobacco (10 + 11 + 12)</b>          | <b>17323</b>   | <b>14773</b>   | <b>15517</b>   | <b>15272</b>   | <b>15119</b>   | <b>15544</b>   | <b>89,7</b>    |
| <b>of them in PE</b>   | <b>10772</b>   | <b>8366</b>    | <b>9989</b>    | <b>10168</b>   | <b>9621</b>    | <b>9829</b>    | <b>91,2</b>    |
| <b>Food production (10)</b>  | <b>15128</b>   | <b>13769</b>   | <b>14621</b>   | <b>14447</b>   | <b>14270</b>   | <b>14681</b>   | <b>97,0</b>    |
| <b>of them in PE</b>   | <b>9422</b>    | <b>8156</b>    | <b>9735</b>    | <b>9866</b>    | <b>9314</b>    | <b>9533</b>    | <b>101,2</b>   |
| Manufacture of meat and meat products (10.1)                                       | 1907           | 1701           | 1768           | 1718           | 1687           | 1707           | 89,5           |
| of them in PE  | 946            | 819            | 1018           | 1027           | 936            | 932            | 98,5           |
| <b>Processing and preserving of fish, crustaceans and molluscs (10.2)</b>          | <b>521</b>     | <b>481</b>     | <b>443</b>     | <b>426</b>     | <b>414</b>     | <b>416</b>     | <b>79,8</b>    |
| <b>of them in PE</b>   | <b>259</b>     | <b>224</b>     | <b>250</b>     | <b>255</b>     | <b>243</b>     | <b>243</b>     | <b>93,8</b>    |
| Processing and preserving of fruits and vegetables (10.3)                          | 604            | 536            | 566            | 532            | 543            | 588            | 97,3           |
| of them in PE  | 206            | 179            | 231            | 235            | 227            | 251            | 121,8          |
| <b>Manufacture of oils and animal fats (10.4)</b>                                  | <b>1437</b>    | <b>1391</b>    | <b>1552</b>    | <b>1573</b>    | <b>1525</b>    | <b>1521</b>    | <b>105,8</b>   |
| <b>of them in PE</b>   | <b>1021</b>    | <b>884</b>     | <b>1081</b>    | <b>1038</b>    | <b>935</b>     | <b>894</b>     | <b>87,5</b>    |
| Dairy production (10.5)  | 650            | 641            | 655            | 649            | 670            | 709            | 109,0          |
| of them in PE  | 201            | 174            | 254            | 294            | 290            | 308            | 153,2          |
| <b>Manufacture of flour and cereal products, starch and starch products (10.6)</b> | <b>1868</b>    | <b>1707</b>    | <b>1839</b>    | <b>1770</b>    | <b>1680</b>    | <b>1604</b>    | <b>85,8</b>    |
| <b>of them in PE</b>   | <b>1108</b>    | <b>939</b>     | <b>1182</b>    | <b>1119</b>    | <b>998</b>     | <b>922</b>     | <b>83,2</b>    |
| Manufacture of bread, bakery and flour products (10.7)                             | 5733           | 5027           | 5364           | 5153           | 5060           | 5302           | 92,5           |
| of them in PE  | 4234           | 3665           | 4206           | 4146           | 4924           | 4227           | 99,8           |
| <b>Manufacture of other food products (10.8)</b>                                   | <b>1887</b>    | <b>1765</b>    | <b>1891</b>    | <b>2069</b>    | <b>2112</b>    | <b>2281</b>    | <b>120,9</b>   |
| <b>of them in PE</b>   | <b>1158</b>    | <b>1002</b>    | <b>1222</b>    | <b>1431</b>    | <b>1356</b>    | <b>1480</b>    | <b>127,8</b>   |
| Manufacture of prepared animal feeds (10.9)  | 521            | 520            | 543            | 557            | 579            | 553            | 106,1          |
| of them in PE  | 289            | 250            | 291            | 321            | 305            | 276            | 95,5           |
| <b>Production of beverages (11)</b>  | <b>2183</b>    | <b>993</b>     | <b>887</b>     | <b>815</b>     | <b>835</b>     | <b>844</b>     | <b>38,7</b>    |
| of them in PE  | 1350           | 210            | 254            | 302            | 307            | 296            | 21,9           |
| <b>Production of tobacco products (12)</b>   | <b>12</b>      | <b>11</b>      | <b>9</b>       | <b>10</b>      | <b>14</b>      | <b>19</b>      | <b>158,3</b>   |
| <b>of them in PE</b>   | <b>0</b>       | <b>0</b>       | <b>0</b>       | <b>0</b>       | <b>0</b>       | <b>0</b>       | <b>-</b>       |

\* Compiled and calculated by: Number of business entities by type of economic activity in 2010-2018 URL: [https://ukrstat.org/uk/operativ/menu/menu\\_u/size\\_20.htm](https://ukrstat.org/uk/operativ/menu/menu_u/size_20.htm).

However, directly in the food processing industry everything is very ambiguous and contradictory, namely:

- **under section 12** there is a 1.6-fold increase in the number of business entities (from 12 to 19 tobacco manufacturers);

- **under section 11** - reduction of subjects almost in 2,6 times (to 844 enterprises on manufacture of drinks), from them small - in 4,5 times (to 296 units);

- **under section 10** - minor changes: reduction by 3 percentage points (by 447 units - to almost 14.7 thousand), but small business structures increased by 1.2% (by 111 units - to more than 9.5 thousand). The increase is observed in groups:

- 10.4 Production of oil and animal fats (84 - up to 1521 units);
- 10.5 Production of dairy products (59 - up to 709 units);
- 10.8 Production of other food products (by 396 - up to 2281 units). In group 10.8, an increase in the number of subjects was observed for the following classes:
  - 10.82 Manufacture of cocoa, chocolate and sugar confectionery (82 - up to 314 units);
  - 10.83 Production of coffee and tea (107 - up to 219 units);
  - 10.84 Production of spices and seasonings (27 - up to 135 units);
  - 10.85 Production of ready meals and dishes (264 - up to 869 units);
  - 10.86 Production of baby food and dietary food products (by 10 - up to 66 units).

The increase in the contingent of economic entities was due to both general economic trends and industry specifics: increasing the cultivation of oilseeds and production of ready meals and dishes for long-term storage, cooperation of producers of raw milk and its focus on processing, increasing consumer demand for specific and ready food consumption, etc. Thus, the organizational structure of entities operating in the food processing industry has been very actively and comprehensively transformed. However, in our opinion, the key role in this was played not so much by the incompleteness of the process and incomplete formation of the institutional environment, but by significant annual differences in growing and harvesting raw materials of different crops, which significantly affected capacity utilization and thus their expansion or collapse, including changes in the number of business entities.

Regarding trends and transformations in the organizational structure of the food processing industry (Table 6), they indicate a shift in the demography of enterprises not only vertically (for the specified period), but also horizontally (both in the structure of business groups and enterprises - legal entities and natural persons-entrepreneurs). The analysis showed that the most stable in terms of increasing turbulence and declining trend were the group of large business (increase by 4 units - up to 62 entities), and among sole proprietors - the group of medium-sized enterprises (growth by 16 units - up to 54 entities). ). In the first case, this was done by restoring the temporarily unemployed or modernizing idle meat processing, oil and fat and sugar enterprises; in the second - the creation of new small meat processing, fruit and vegetable canning, oil and fat, milk processing, confectionery and feed production facilities. In our opinion, this indicates that the growth of exogenous and endogenous turbulence in the economy as a whole and in diversified complexes affects the organizational structure of the agricultural sector in various ways, but their integral indicator can be considered the effectiveness and efficiency of business entities.

It should be noted that since the 2000s, foreign and domestic industrial holdings, concerns, and corporations have begun to actively penetrate the agricultural sector. land banks ". In general, at the beginning of the 2000s, a quarter of agricultural land was managed by agricultural holdings, and the number of holding companies exceeded one hundred. Their appearance accelerated the concentration of capital in the agricultural sector and attract investment resources from other industries, contributed to the formation of vertically integrated structures with a complete cycle of finished food production, increase its profitability, active access of agricultural enterprises to foreign food markets [26, p. 75-79] and so on.

We emphasize that the structure of existing economic entities actually embodies a concentrated reflection of the spatial features of their organization and trends, which symbolize, on the one hand, the initial prerequisites of any production and the results obtained during the previous period of economic activity. year, and on the other - reveal the dynamics of effectiveness and efficiency of business structures for a long period of time. Since the changes in the institutional structure of the subjects were analyzed above, we will reveal the specifics of the formation of economic data on key indicators in the dynamics since 2000.

Table 6. Dynamics and structure of large, medium, small and micro enterprises by types of economic activity \*, units

| Types of economic activity and their codes  | Years, % (2018 to 2010) | Number of business entities (total and by business groups) |              |              |                |                  |                                     |              |                |                  |
|---|-------------------------|--|--------------|--------------|----------------|------------------|-------------------------------------|--------------|----------------|------------------|
|   |                         | Entrepreneurs PE by groups:                                |              |              |                |                  | Of these, individual entrepreneurs: |              |                |                  |
|   |                         | total PE   | including:   |              |                |                  | total IE                            | including:   |                |                  |
|   |                         |  | big          | average      | small          | of which micro - |                                     | average      | small          | of which micro - |
| 1   | 2                       | 3  | 4            | 5            | 6              | 7                | 8                                   | 9            | 10             | 11               |
| <b>Total</b><br>(18 sections of NACE 009: 2010, except for three sections: O; T; U) | <b>2010</b>             | <b>2183928</b>   | <b>586</b>   | <b>21343</b> | <b>2161999</b> | <b>2093688</b>   | <b>1805118</b>                      | <b>360</b>   | <b>1804758</b> | <b>1793243</b>   |
|   | <b>2018</b>             | <b>1839593</b>   | <b>446</b>   | <b>16476</b> | <b>1822671</b> | <b>1764737</b>   | <b>1483716</b>                      | <b>419</b>   | <b>1483297</b> | <b>1471965</b>   |
|   | <b>%</b>                | <b>84,2</b>  | <b>76,1</b>  | <b>77,2</b>  | <b>84,3</b>    | <b>84,3</b>      | <b>82,2</b>                         | <b>116,4</b> | <b>82,2</b>    | <b>82,0</b>      |
| <b>1</b>  | <b>2</b>                | <b>3</b>   | <b>4</b>     | <b>5</b>     | <b>6</b>       | <b>7</b>         | <b>8</b>                            | <b>9</b>     | <b>10</b>      | <b>11</b>        |
| Industry (B + C + D + E)  | 2010                    | 151969   | 347          | 6168         | 145454         | 133443           | 104142                              | 61           | 104081         | 102668           |
|   | 2018                    | 125869   | 237          | 4966         | 120656         | 109676           | 81434                               | 100          | 81334          | 79787            |
|   | %                       | 82,8   | 68,3         | 80,5         | 82,9           | 82,2             | 78,2                                | 163,9        | 78,1           | 77,7             |
| <b>Manufacturing (C)</b>  | <b>2010</b>             | <b>143012</b>  | <b>224</b>   | <b>4968</b>  | <b>137820</b>  | <b>127465</b>    | <b>101794</b>                       | <b>60</b>    | <b>101734</b>  | <b>100344</b>    |
|   | <b>2018</b>             | <b>115949</b>  | <b>163</b>   | <b>4017</b>  | <b>111769</b>  | <b>102359</b>    | <b>79087</b>                        | <b>98</b>    | <b>78989</b>   | <b>77472</b>     |
|   | <b>%</b>                | <b>81,0</b>  | <b>72,8</b>  | <b>80,9</b>  | <b>81,1</b>    | <b>80,3</b>      | <b>77,7</b>                         | <b>163,3</b> | <b>77,6</b>    | <b>77,2</b>      |
| Manufacture of food products, beverages and tobacco (10 + 11 + 12)                  | 2010                    | 17323  | 58           | 1338         | 15927          | 13915            | 10772                               | 38           | 10734          | 10193            |
|   | 2018                    | 15544  | 62           | 1039         | 14443          | 12783            | 9829                                | 54           | 9775           | 9332             |
|   | %                       | 89,7   | 106,9        | 77,6         | 90,7           | 91,8             | 91,2                                | 142,1        | 91,0           | 91,5             |
| <b>Food production (10)</b>   | <b>2010</b>             | <b>15128</b>   | <b>44</b>    | <b>1141</b>  | <b>13943</b>   | <b>12180</b>     | <b>9422</b>                         | <b>32</b>    | <b>9390</b>    | <b>8919</b>      |
|   | <b>2018</b>             | <b>14682</b>   | <b>49</b>    | <b>936</b>   | <b>13697</b>   | <b>12170</b>     | <b>9533</b>                         | <b>53</b>    | <b>9480</b>    | <b>9045</b>      |
|   | <b>%</b>                | <b>97,0</b>  | <b>111,4</b> | <b>82,0</b>  | <b>98,2</b>    | <b>99,9</b>      | <b>101,1</b>                        | <b>165,6</b> | <b>100,9</b>   | <b>101,4</b>     |
| Manufacture of meat and meat products (10.1)  | 2010                    | 1907   | 9            | 178          | 1720           | 1413             | 946                                 | 7            | 939            | 871              |
|   | 2018                    | 1707   | 12           | 125          | 1570           | 1301             | 932                                 | 8            | 924            | 856              |
|   | %                       | 89,5   | 133,3        | 70,2         | 91,2           | 92,0             | 98,5                                | 114,2        | 98,4           | 98,3             |
| <b>Processing and preserving of fish, crustaceans and molluscs (10.2)</b>           | <b>2010</b>             | <b>521</b>   | <b>0</b>     | <b>42</b>    | <b>479</b>     | <b>393</b>       | <b>259</b>                          | <b>2</b>     | <b>257</b>     | <b>242</b>       |
|   | <b>2018</b>             | <b>416</b>   | <b>1</b>     | <b>30</b>    | <b>385</b>     | <b>334</b>       | <b>243</b>                          | <b>2</b>     | <b>241</b>     | <b>229</b>       |
|   | <b>%</b>                | <b>79,9</b>  | <b>-</b>     | <b>71,4</b>  | <b>80,3</b>    | <b>85,0</b>      | <b>93,8</b>                         | <b>100,0</b> | <b>93,8</b>    | <b>94,6</b>      |
| Processing and preserving of fruits and vegetables (10.3)                           | 2010                    | 604  | 3            | 65           | 536            | 432              | 206                                 | 1            | 205            | 196              |
|   | 2018                    | 588  | 2            | 53           | 533            | 443              | 251                                 | 3            | 248            | 237              |
|   | %                       | 97,3   | 66,7         | 81,5         | 99,4           | 102,5            | 121,8                               | 300,0        | 121,0          | 120,9            |
| <b>Manufacture of oils and animal fats (10.4)</b>                                   | <b>2010</b>             | <b>1437</b>  | <b>7</b>     | <b>67</b>    | <b>1363</b>    | <b>1265</b>      | <b>1021</b>                         | <b>1</b>     | <b>1020</b>    | <b>996</b>       |
|   | <b>2018</b>             | <b>1521</b>  | <b>11</b>    | <b>100</b>   | <b>1410</b>    | <b>1276</b>      | <b>894</b>                          | <b>4</b>     | <b>890</b>     | <b>868</b>       |
|   | <b>%</b>                | <b>105,8</b>   | <b>157,1</b> | <b>149,2</b> | <b>103,4</b>   | <b>100,8</b>     | <b>87,5</b>                         | <b>400,0</b> | <b>87,2</b>    | <b>87,1</b>      |
| Manufacture of dairy products (10.5)  | 2010                    | 650  | 10           | 187          | 453            | 378              | 201                                 | 1            | 200            | 192              |
|   | 2018                    | 709  | 10           | 130          | 569            | 484              | 308                                 | 2            | 306            | 293              |
|   | %                       | 109,0  | 100,0        | 69,5         | 125,6          | 128,0            | 153,2                               | 200,0        | 153,0          | 152,6            |
| <b>Manufacture of flour and cereal products, starch and starch products (10.6)</b>  | <b>2010</b>             | <b>1888</b>  | <b>0</b>     | <b>96</b>    | <b>1772</b>    | <b>1613</b>      | <b>1108</b>                         | <b>1</b>     | <b>1107</b>    | <b>1087</b>      |
|   | <b>2018</b>             | <b>1604</b>  | <b>0</b>     | <b>76</b>    | <b>1528</b>    | <b>1376</b>      | <b>922</b>                          | <b>1</b>     | <b>921</b>     | <b>896</b>       |
|   | <b>%</b>                | <b>84,9</b>  | <b>0</b>     | <b>79,1</b>  | <b>86,2</b>    | <b>85,3</b>      | <b>83,2</b>                         | <b>100,0</b> | <b>83,2</b>    | <b>82,4</b>      |
| Manufacture of bread, bakery and flour products (10.7)                              | 2010                    | 5733   | 5            | 309          | 5419           | 4715             | 4234                                | 17           | 4217           | 3934             |
|   | 2018                    | 5302   | 2            | 239          | 5061           | 4555             | 4227                                | 29           | 4198           | 3952             |
|   | %                       | 92,5   | 40,0         | 77,3         | 93,4           | 96,6             | 99,8                                | 170,6        | 99,5           | 100,4            |
| <b>Manufacture of other food products (10.8)</b>                                    | <b>2010</b>             | <b>1887</b>  | <b>8</b>     | <b>158</b>   | <b>1721</b>    | <b>1538</b>      | <b>1158</b>                         | <b>2</b>     | <b>1156</b>    | <b>1119</b>      |
|   | <b>2018</b>             | <b>2281</b>  | <b>10</b>    | <b>150</b>   | <b>2121</b>    | <b>1940</b>      | <b>1480</b>                         | <b>3</b>     | <b>1477</b>    | <b>1444</b>      |
|   | <b>%</b>                | <b>120,9</b>   | <b>125,0</b> | <b>94,9</b>  | <b>123,2</b>   | <b>126,1</b>     | <b>127,8</b>                        | <b>150,0</b> | <b>127,8</b>   | <b>129,0</b>     |
| Manufacture of prepared animal feeds (10.9)   | 2010                    | 521  | 2            | 39           | 480            | 433              | 289                                 | 0            | 289            | 285              |
|   | 2018                    | 306  | 2            | 38           | 266            | 224              | 276                                 | 1            | 275            | 270              |
|   | %                       | 58,7   | 100,0        | 97,4         | 55,4           | 51,7             | 95,5                                | --           | 95,1           | 94,7             |
| <b>Production of beverages (11)</b>   | <b>2010</b>             | <b>2183</b>  | <b>10</b>    | <b>196</b>   | <b>1977</b>    | <b>1729</b>      | <b>1350</b>                         | <b>6</b>     | <b>1344</b>    | <b>1274</b>      |
|   | <b>2018</b>             | <b>844</b>   | <b>10</b>    | <b>100</b>   | <b>734</b>     | <b>604</b>       | <b>296</b>                          | <b>1</b>     | <b>295</b>     | <b>287</b>       |
|   | <b>%</b>                | <b>38,7</b>  | <b>100,0</b> | <b>51,0</b>  | <b>37,1</b>    | <b>34,9</b>      | <b>21,9</b>                         | <b>16,7</b>  | <b>21,9</b>    | <b>22,5</b>      |
| Production of tobacco products (12)   | 2010                    | 12   | 4            | 1            | 7              | 6                | 0                                   | 0            | 0              | 0                |
|   | 2018                    | 19   | 4            | 3            | 12             | 9                | 0                                   | 0            | 0              | 0                |
|   | %                       | 158,3  | 100,0        | 300,0        | 171,4          | 150,0            | -                                   | -            | -              | -                |

\* Compiled and calculated by: Number of large, medium, small and micro enterprises by type of economic activity in 2010-2018. URL: [https://ukrstat.org/uk/operativ/menu/menu\\_u/size\\_20.htm](https://ukrstat.org/uk/operativ/menu/menu_u/size_20.htm).



Table 7. Effectiveness and efficiency of the agricultural sector of the economy of Ukraine \*, in %

| Code  | Indexes        |    | Years: |       |       |       |       |       |       |       |       |       |
|---|----------------|----|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|   |                |    | 2000   | 2001  | 2002  | 2003  | 2004  | 2005  | 2006  | 2007  | 2008  | 2009  |
| Agriculture, hunting and related services; 01                                     |                |    |        |       |       |       |       |       |       |       |       |       |
| 01  | Gross output   |    | 53,4   | 58,9  | 59,6  | 53,0  | 63,5  | 63,5  | 65,1  | 60,9  | 71,3  | 70,0  |
|   | Profitability: | AA |        |       |       |       |       |       | 7,4   | 15,1  | 7,3   | 8,7   |
|   |                | OA |        |       |       |       |       |       |       |       |       | 14,4  |
| Profitable enterprises  |                |    |        |       |       |       |       |       | 67,6  | 72,0  | 71,1  | 69,2  |
| Industry for the production of food, beverages and tobacco products; 10 + 11 + 12 |                |    |        |       |       |       |       |       |       |       |       |       |
| 10+<br>11+<br>12  | Product index  |    | 52,1   | 61,6  | 66,7  | 80,1  | 90,0  | 102,4 | 109,3 | 117,5 | 115,0 | 108,1 |
|   | Profitability  | AA | 3,5    |       |       |       |       |       |       |       |       |       |
|   |                | OA |        |       |       |       |       |       |       |       |       |       |
| Profitable enterprises  |                |    | 46,8   |       |       |       |       |       |       |       |       |       |
| Continuation and end of table 7   |                |    |        |       |       |       |       |       |       |       |       |       |
| Ко-<br>ди   | Indexes        |    | Years: |       |       |       |       |       |       |       |       |       |
|   |                |    | 2010   | 2011  | 2012  | 2013  | 2014  | 2015  | 2016  | 2017  | 2018  | 2019  |
| 1   | 2              |    | 13     | 14    | 15    | 16    | 17    | 18    | 19    | 20    | 21    | 22    |
| Agriculture, hunting and related services; 01                                     |                |    |        |       |       |       |       |       |       |       |       |       |
| 01  | Gross output   |    | 68,9   | 82,6  | 79,0  | 89,4  | 92,6  | 88,2  | 93,8  | 91,7  | 99,1  | 100,2 |
|   | Profitability: | AA | 17,4   | 19,3  | 16,3  | 8,3   | 9,2   | 30,4  | 25,6  | 16,5  | 14,2  | 16,1  |
|   |                | OA | 24,4   | 24,7  | 22,8  | 11,7  | 21,4  | 43,0  | 33,6  | 23,2  | 18,9  | 19,3  |
| Profitable enterprises  |                |    | 69,6   | 83,5  | 76,8  | 80,3  | 84,9  | 88,9  | 88,4  | 86,7  | 86,7  | 83,4  |
| Industry for the production of food, beverages and tobacco products; 10 + 11 + 12 |                |    |        |       |       |       |       |       |       |       |       |       |
| 10+<br>11+<br>12  | Product index  |    | 111,6  | 110,9 | 112,7 | 106,9 | 109,5 | 95,2  | 101,3 | 108,6 | 107,0 | 107,2 |
|   | Profitability  | AA | 0,9    | 0,8   | 2,5   | 2,3   | -4,5  | -3,3  | -1,3  | 1,4   | 2,3   | 4,8   |
|   |                | OA | 4,5    | 4,2   | 6,4   | 6,1   | 5,1   | 3,0   | 2,8   | 5,1   | 4,9   | 6,1   |
| Profitable enterprises  |                |    | 58,8   | 58,1  | 60,3  | 62,1  | 61,6  | 72,0  | 70,8  | 69,1  | 70,0  | 70,7  |

\* Compiled and calculated according to the statistical collections of Ukraine for the respective years.

**Note:** Profitability: AA - all activities, OA - operating activities; blank lines - relevant statistics are archived.

Listed in Table 7 relative or estimated data allow us to draw a number of conclusions about the progress of the agricultural sector of the economy in the direction of achieving the pre-reform level of production, but on a modern institutional and organizational basis. Among them the most important are:

- agriculture has reached the pre-reform scale of gross output (1990 was taken as 100%, and the "bottom of the recession" was noted in 1999 - 48.6%) in almost twenty years (2019 - 100.2%). However, in the same period, it overcame two more agrarian crises (2009-2010 and 2015), which significantly slowed down the upward trend;
- the industry for the production of food, beverages and tobacco products reached the pre-reform volume of output (marketable "bottom of the recession" in 1998 - 37.4%) in seven years (in 2005 - 102.4%), ie more than three times faster than agriculture, which is good reason to perceive this as a real consequence of the accelerated adaptation of entities to the new institutional environment, as well as the active realization of the benefits of a market economy, even with a significant lag with increasing food production;
- much higher profitability of agricultural production, compared with the results of economic activity of food processing enterprises, seems to be somewhat illogical and partly due to a number of factors that were generated by the protracted process of recovery from the recession and the emergence of new challenges. In particular, lower wages in agriculture (14% lower in 2018 compared to food processing industries), reduction of real incomes of food producers based on fictitious operating costs, withdrawal of a certain part of the final food products in the shadow sphere, etc.;
- on an average annual basis for the last ten years, the share of agricultural enterprises that made a profit was 82.92%, and the processing and food industry - 65.35%; the share of natural persons-entrepreneurs was 30.1% and 63.2%, respectively; reduction in the number of agricultural enterprises for the period 2010-2018 amounted to 4.3 percentage points, including PE - 11.4 percentage points, and the food industry, respectively, 10.3 and 8.8 percentage points. Thus, the subjects of entrepreneurial activity in agriculture proved to be more resistant to the changing

conditions of the recession than the processing and food industry, and this had a corresponding effect on the results of management, etc.

### **5. Conclusions**

1. The agricultural sector of Ukraine, after overcoming the protracted downward trend caused by agrarian and land reforms in the 1990s, faced a number of acute and urgent problems. Their solution is associated with the formation of a modern institutional environment and on its basis the formation of a new organizational structure of economic entities. The institutional environment is created by a set of institutions (laws, norms, rules, traditions) and institutions (organizational structures) that must ensure their compliance. The influence of the institutional environment is realized through the creation of a rational spatial and organizational structure of economic entities and as a result is the formation of the institutional architecture of the economy, including the agricultural sector. During the economic activity and in the conditions of increasing competition, not only the number and organizational structure of the subjects changed, but also the institutional environment, which constantly strived for balance and integrity. In the integral socio-economic system of the agricultural sector there are laws of architecture: equilibrium, the golden mean and structuring.

2. The approaches adopted by Ukraine to the classification of economic entities by type of main economic activity indicate the following. The introduction of the established principles of systematization and grouping of enterprises ensured the comparability of the structure of indicators of the real state and results of business structures of Ukraine with similar ones in EU countries and the formation of adequate conclusions and proposals aimed at overcoming declining trends, stabilizing and improving them. At the same time, the establishment of state market surveillance authorities in Ukraine according to the model adopted in the EU, the introduction of technical regulations, sanitary and phytosanitary measures, food and feed safety at enterprises and farms of the agricultural sector has expanded the geography of agricultural exports and increased its role in foreign economic activity.

3. The organizational structure and territorial network of economic entities are constantly being transformed. Theoretically, the purpose of such changes is to ensure the achievement of their optimal structure for a particular stage of economic conditions and to promote the growth of business results. The significant period of time between the formation of a balanced and holistic institutional environment and the implementation of its provisions and practices, based on their awareness of the subjects of production and through specific actions of management, has delayed the creation of a rational organizational structure. Delays in the formation of the optimal composition of economic entities, but with the emergence of a multimillion-dollar sector of smallholders and became a catalyst for foreign and domestic industrial structures in the agricultural sector and their concentration of capital and, above all, land by creating land banks.

4. Constant multifaceted and ambiguous changes in the internal state and exogenous environment in relation to the agricultural sector and their turbulence have actively influenced the demography, structure and sustainability of organizational and legal forms of management. To this was added the complexity of the conditions of formation and the contradictory and divergent nature of changes and the formation of the market environment, very weak competitiveness and low efficiency of new business structures, active penetration and initiative in the agricultural sector of external industrial and investment structures, which together caused significant changes. In particular, the number of production cooperatives and halved state-owned enterprises, as well as partially farms and almost a quarter of private farms have quadrupled in the context of widespread unemployment in rural areas. But even in such difficult conditions, private enterprises, the segment of which has expanded by a quarter, and one and a half times - the subjects of other forms of economic activity have proved to be stable and competitive. Thus, due to a set of objective circumstances, the organizational structure of the entities has been significantly transformed and is much more in line with both the current institutional environment and modern business conditions.

5. Adoption of the Law of Ukraine "On the circulation of agricultural land" will ensure the introduction of the land market in the second half of 2021. Despite the safeguards for the inclusion of limited (marginal) land, past practice has shown that investors with free investment will look for different ways to evade compliance in order to buy the maximum possible amount of agricultural land

and form powerful land banks. Thus, the situation in the field of land redistribution between owners and investors is extremely rapidly transforming and it will require active involvement of scientists in monitoring, objective assessment of agricultural land concentration processes and development of necessary proposals aimed at modernizing the institutional environment and organizational structure. management.

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## **TRENDS AND GOALS OF THE COMPETITIVITY OF THE AGRICULTURAL SECTOR OF THE REPUBLIC OF MOLDOVA**

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**Abstract:** *Competitiveness is an important factor in the viability of companies and the economy in general. Globalized trade relations have placed the subject of competitiveness on several levels - micro, medium, macro and meta-economic, which interact and influence each other. The issue of competitiveness of the agricultural sector is extremely important, given its GDP and the number of people employed in this sector of the national economy. The development of agricultural competitiveness in the Republic of Moldova was analysed on the base of a statistical data analysis. The dynamic analysis of the data allowed to be observed the trends and goals of competitiveness of the given sector.*

**Keywords:** *competitiveness, agriculture, strategy*

**JEL classification:** Q18, Q19

**UDC:** 338.43:339.14(478)

### **1. Introduction**

The scale and impact of agriculture in the 21st century are more important than previously thought. Its multifunctional nature demonstrates that modern agriculture does not only have the role of providing food. We can say with certainty that, being in an obvious cohesion with rural areas, agriculture is interdependent with the environment, which gives it, in addition to the important economic role, an ecological and a social role. Even its primary production function has changed, with a focus now on food safety and diversity, and the 21st century has brought new challenges for agriculture, such as price volatility, climate change and rural poverty [12].

One of the problems related to the competitiveness' evaluation is the multilateral understanding of this term. Regardless of the level of analysis, competitiveness (or, in other words, market rivalry) manifests itself and is studied at the world economic, macroeconomic (country), branch (internal or external market), enterprise and product or commodity (service) level [8, p.127].

*At the macro-level*, competitiveness (competitiveness) can be defined as the country ability to generate more added value than its competitors in the world or the national capacity to achieve growth. Economists of the Organization for Economic Co-operation and Development have described the policy of competitiveness as a support to increase the abilities of companies, industries, regions to generate and maintain a high level of income and employment [4, p.13]. Thus, according to this view, a national economy can be called competitive, only if:

- its productivity grows at a rate equal to the grows-rate of its commercial partners with a comparable level of development;
- the exports dominates in the commercial trade-balance;
- a high level of employment is keeping on.

*The competitiveness of the branch/sector* (industry, agriculture, etc.) can be analyzed at the level of the internal market and the external market. The competitiveness of the *domestic branch or sector* is determined by obtaining competitive advantages and performance of the firms in this branch or sector in comparison to the firms in the other branches or sectors of the national economy.

*The competitiveness of the industry branch or sector at the external level* can be valued by the capacity to a massive and large export, including of capital, in a considerable number of countries.

Competitiveness has a dual function:

- following the evolution of the organization;
- orientation towards different ways (quality, accuracy, cost, reliability, change) to maintain the niche market or to maintain market expansion.

Thus, competitive forces organizations to be in a state of competition, the success of this rivalry being expressed by the position, segment or niche that the economy or organization occupies.

The generalized definition of competitiveness expresses the capacity of companies, firms, economies, regions to maintain in the internal and international trade rivalry and to obtain economic advantages from it. Being presented for the first time by Michael E. Porter [9] through the "diamond" of competitive forces (Figure 1), the rivalry was later researched in areas, activities and branches in order to identify the particularities of specific competitive relationships.

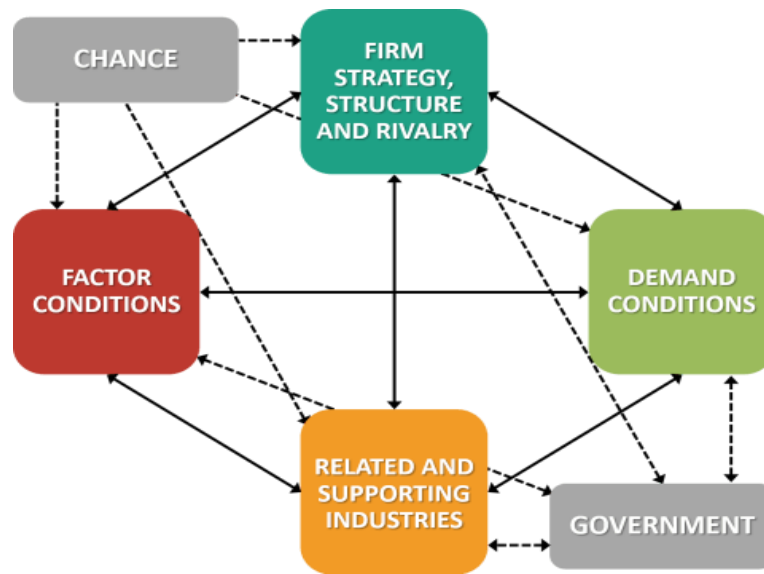


Figure 1: The Complete System of Competitive Forces  
(Porter's Diamond Model of National Competitive Advantage)

Source: [9, p. 127]

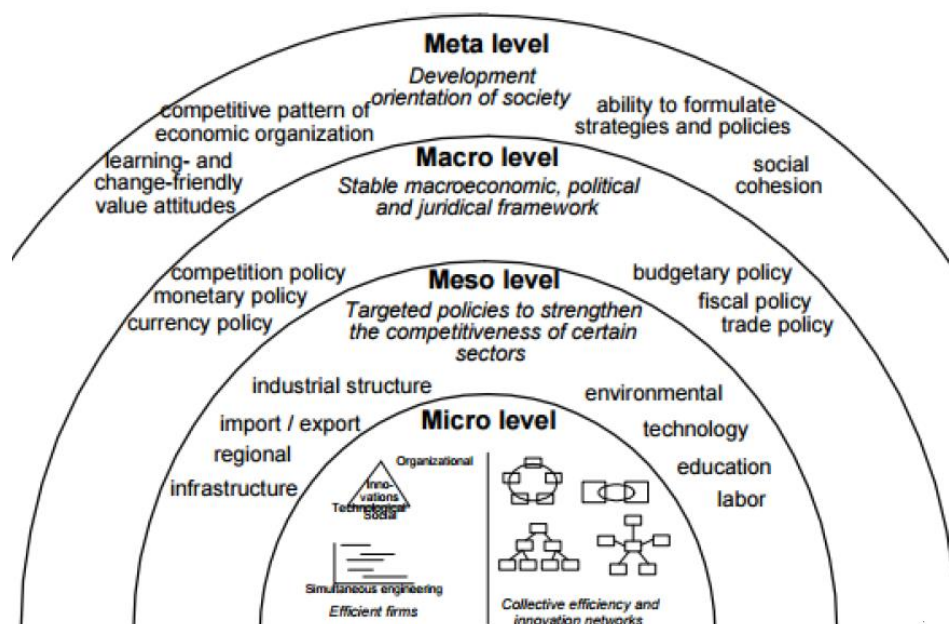


Figure 2. The Determinants of Systemic Competitiveness

Source: [1, p. 1 of maintext]

Also, some researchers (Tilman Altenburg, Wolfgang Hillebrand, Jörg Meyer-Stamer) [1] approached the systemic vision of competitiveness, in which the determinants are grouped on 4 levels: micro- meso-, macro-, meta- (Figure 2). In the systemic approach to competitiveness, in addition to the factors determined at the micro- (enterprises, consumers and transactions), meso (branches, industries, regions) and macro- (trade and exchange rate, trade and fiscal policy external analysis, etc.) levels the analysis of the meta-level is also necessary, in order to determine the role of the state in creating the conditions that more or less influence the sustainable economic development; how public and related institutions interact, as well as which are objectively pursued in the context of economic development in the context of their interaction.

Respectively, the competitive strategies of some sectors of the national economy can be placed in a system of systemic relations that allow their extrapolation through all levels which are higher than the microeconomic one (Figure 3).

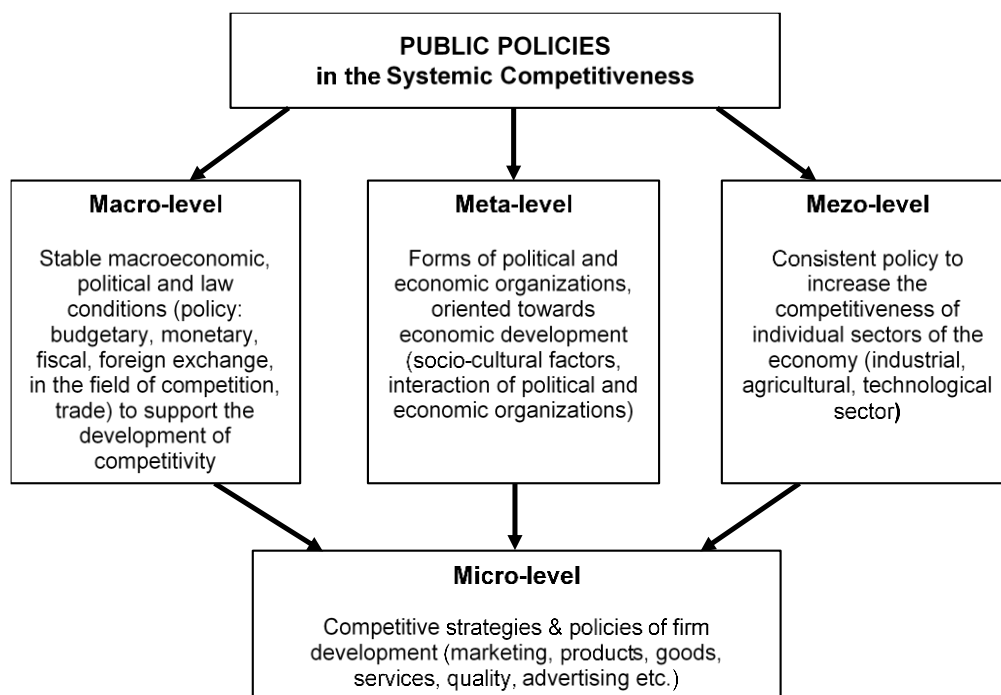


Figure 3. The role of public policies in the Systemic Competitiveness

Source: developed by author

A firm's or industry sector's competitiveness refers to how to the way in which it relates to its market rivals, representing the ability of successfully selling of goods or services. In the medium and long term, the other parameters that we are tempted to associate with the concept of economic success (first of all, profit) are subordinated to the 'market segment' parameter.

## 2. Applied research methods and materials

The development of the Republic of Moldova agricultural sector competitiveness was evaluated by an analysis of statistical data. The analysis allowed to identify the trends of competitiveness of the given sector. The used database was <https://statistica.gov.md/>

## 3. Obtained results and discussions

### Analysis of agricultural sector of the Republic of Moldova

Even if the role of the agricultural sector for the national economy of Moldova is important for ensuring food security, the share of agriculture's contribution to the formation of Gross Value Added (GVA) and Gross Domestic Product (GDP) is decreasing. (Figure 4, Table 1).



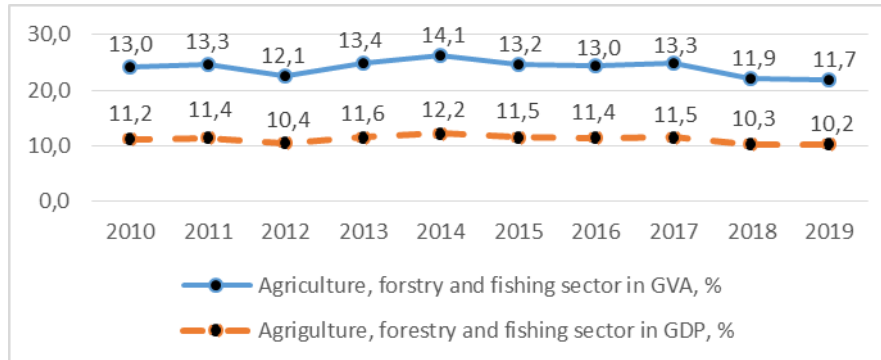


Figure 4. Share of agriculture, forestry and fishing sector participation in Gross Value Added (GVA) and Gross Domestic Product (GDP) formation, %

Source: developed by author according to [11]. Selected from:

[https://statistica.gov.md/public/files/serii\\_de\\_timp/conturi\\_nationale/serii\\_anuale/PIB\\_resurse\\_utilizari\\_2010\\_2019.xls](https://statistica.gov.md/public/files/serii_de_timp/conturi_nationale/serii_anuale/PIB_resurse_utilizari_2010_2019.xls)

Table 1. Evolution of agricultural production and GDP, millions of Lei MD

|  | 2010   | 2011   | 2012    | 2013    | 2014    | 2015    | 2016    | 2017    | 2018    | 2019    |
|--|--------|--------|---------|---------|---------|---------|---------|---------|---------|---------|
| Agriculture, forestry and fishing  | 9.629  | 11.244 | 11.020  | 13.806  | 16.317  | 16.769  | 18.330  | 20.521  | 19.772  | 21.397  |
| Gross Value Added - GVA  | 74.310 | 84.813 | 90.938  | 102.741 | 115.935 | 127.063 | 140.887 | 154.814 | 166.472 | 183.074 |
| Contribution of Agriculture, forestry and fishing sector to GVA formation, % | 13,0   | 13,3   | 12,1    | 13,4    | 14,1    | 13,2    | 13,0    | 13,3    | 11,9    | 11,7    |
| Gross Domestic Product - GDP   | 86.275 | 98.772 | 105.480 | 119.532 | 133.481 | 145.753 | 160.814 | 178.880 | 192.508 | 210.378 |
| Share of Agriculture, forestry and fishing sector in GDP, %                  | 11,2   | 11,4   | 10,4    | 11,6    | 12,2    | 11,5    | 11,4    | 11,5    | 10,3    | 10,2    |

Source: developed by author according to [11]. Selected from:

[https://statistica.gov.md/public/files/serii\\_de\\_timp/conturi\\_nationale/serii\\_anuale/PIB\\_resurse\\_utilizari\\_2010\\_2019.xls](https://statistica.gov.md/public/files/serii_de_timp/conturi_nationale/serii_anuale/PIB_resurse_utilizari_2010_2019.xls)

At the same time, the rate of annual increasing of agricultural sector is much lower than average increasing of GDP (Figure 5).

It should be mentioned that according to Moldova National Statistics Bureau, the Agricultural sector includes in statistical evidence agricultural, forestry and fishing activities. Because the last two (forestry and fishing) has a small percentage, we can analyse statistical data addressing them mostly to agricultural activities.

For the period 2010-2019, the share of agriculture decreased from 11,2% to 10,2%. This trend shows that low rates of development of agricultural technologies and management of agri-food enterprises have influenced the distribution of GDP sources for the processing of non-food raw materials and services.

The Republic of Moldova is characterized by a variable continental, semi-humid climate, often with a high deficit of soil moisture, frequent droughts, floods, hail and frost. Agriculture is one of the most vulnerable sectors of the national economy in climatic conditions. Climate instability is one of the main causes of low yields and poses an imminent risk to agriculture. The average monthly temperatures were between -8.5 °C in January and + 26.0 °C in August. The warm period of the year lasts about 190 days. The annual intensity of precipitation decreases from northwest to southeast.



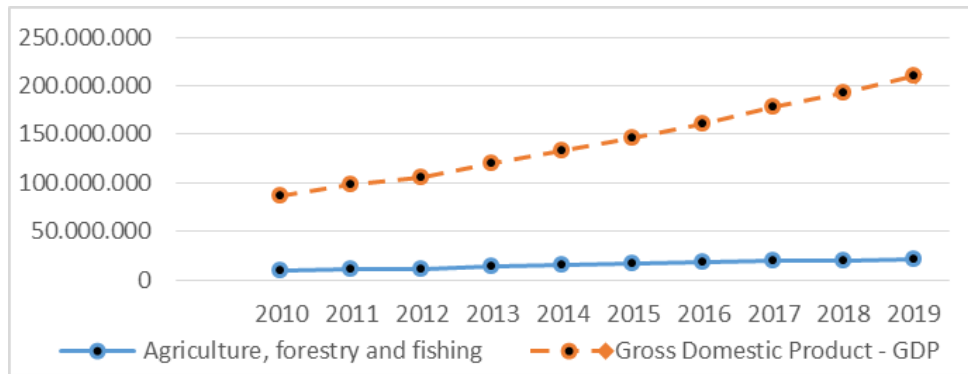


Figure 5. Evolution of agricultural production and GDP, millions of Lei MD

Source: developed by author according to [11]. Selected from:

[https://statistica.gov.md/public/files/serii\\_de\\_timp/conturi\\_nationale/serii\\_anuale/PIB\\_resurse\\_utilizari\\_2010\\_2019.xls](https://statistica.gov.md/public/files/serii_de_timp/conturi_nationale/serii_anuale/PIB_resurse_utilizari_2010_2019.xls)

Annual fluctuations in agricultural production are largely due to climatic and external factors. The Republic of Moldova is a risk zone for agriculture, as there are frequent periods of droughts and floods. Likewise, external factors that have negatively influenced the agricultural sector are related to restrictions and embargoes imposed on Moldovan agricultural producers, given the traditional economic ties with the market in the Russian Federation, where fresh vegetables are exported en masse (Figure 6).

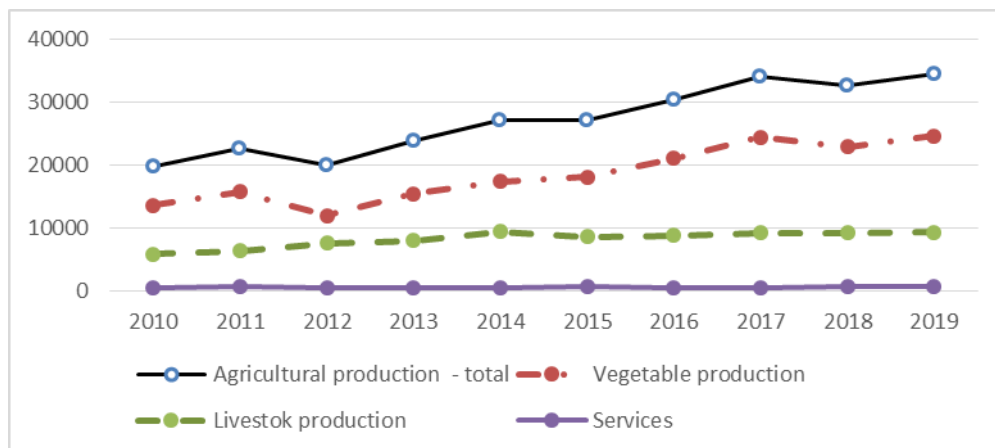


Figure 6. Evolution of agricultural production, millions of Lei MD

Source: developed by author according to [11]. Selected from:

[https://statbank.statistica.md/PxWeb/pxweb/ro/40%20Statistica%20economica/40%20Statistica%20economica\\_16%20AGR\\_AGR010/AGR010100.px/?rxid=b2ff27d7-0b96-43c9-934b-42e1a2a9a774](https://statbank.statistica.md/PxWeb/pxweb/ro/40%20Statistica%20economica/40%20Statistica%20economica_16%20AGR_AGR010/AGR010100.px/?rxid=b2ff27d7-0b96-43c9-934b-42e1a2a9a774)

Table 2. Evolution of agricultural production, millions of Lei MD

|  | 2010  | 2011  | 2012  | 2013  | 2014  | 2015  | 2016  | 2017  | 2018  | 2019  |
|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| <b>Agricultural production - total</b> | 19873 | 22619 | 19922 | 23814 | 27254 | 27193 | 30362 | 34142 | 32637 | 34597 |
| <b>Vegetable production</b>            | 13616 | 15751 | 11968 | 15480 | 17341 | 18082 | 21098 | 24435 | 22883 | 24670 |
| <b>Livestock production</b>            | 5786  | 6347  | 7529  | 7930  | 9417  | 8584  | 8768  | 9191  | 9190  | 9248  |
| <b>Services</b>                        | 471   | 521   | 425   | 404   | 496   | 527   | 496   | 516   | 564   | 679   |

Source: developed by author according to [11]. Selected from:

[https://statbank.statistica.md/PxWeb/pxweb/ro/40%20Statistica%20economica/40%20Statistica%20economica\\_16%20AGR\\_AGR010/AGR010100.px/?rxid=b2ff27d7-0b96-43c9-934b-42e1a2a9a774](https://statbank.statistica.md/PxWeb/pxweb/ro/40%20Statistica%20economica/40%20Statistica%20economica_16%20AGR_AGR010/AGR010100.px/?rxid=b2ff27d7-0b96-43c9-934b-42e1a2a9a774)

The increase in GVA and GDP is due to the increasing share of industry, construction and non-industrial activities (trade, information and communication services, financial and insurance activities, real estate transactions). According to the growth rate of GVA and the number of employees in the economy, we can see that in these economic areas the result of growth is due to increased labour productivity and commercial transactions.

An opposite situation is observed in the agricultural sector, which accounts for about 30% of the total number of people employed in the economy (Figure 7), but has an contribution to GVA of about 13%, with a downward trend in recent years (2017-2019), presented in figure 4 and table 1.

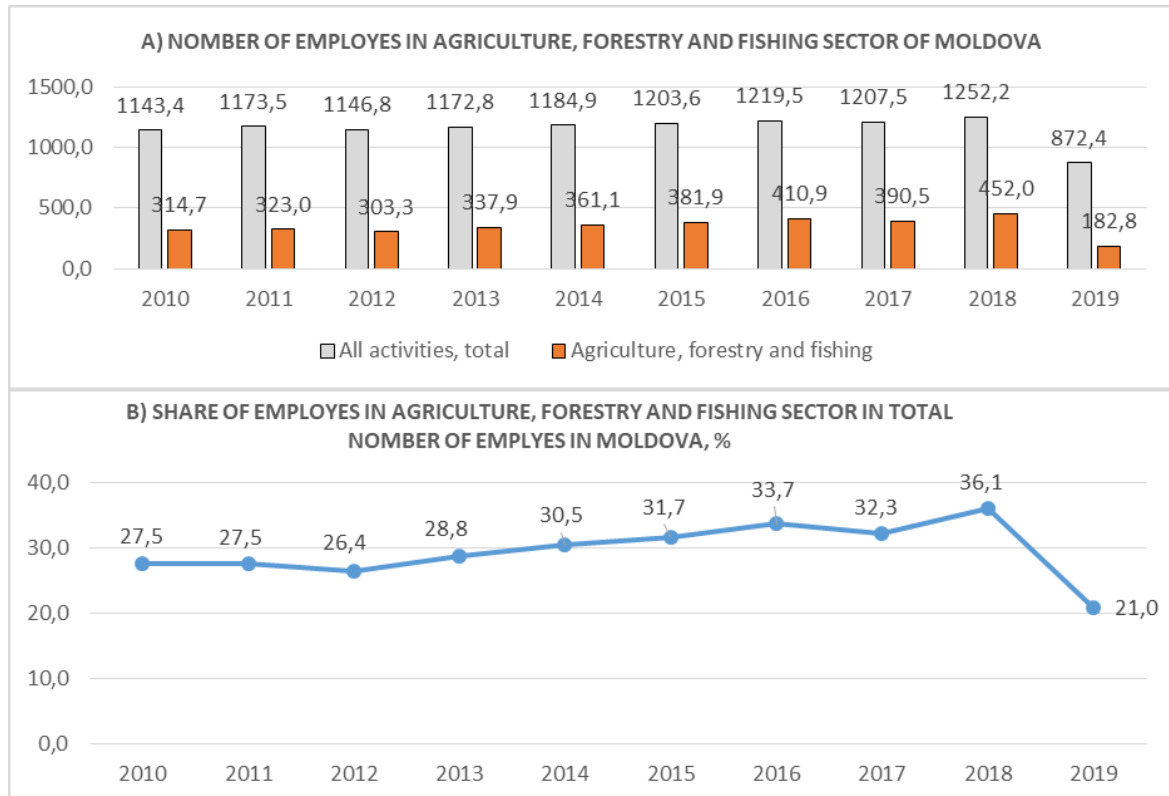


Figure 7 (a, b) Evolution of the employees in agriculture, forestry and fishing sector of Moldova

Source: developed by author according to [11]. Selected from:

For 2010-2018 see:

[https://statbank.statistica.md/PxWeb/pxweb/ro/30%20Statistica%20sociala/30%20Statistica%20sociala\\_03%20FM\\_03%20MUN2000\\_MUN020/MUN020500.px/?rxid=b2ff27d7-0b96-43c9-934b-42e1a2a9a774](https://statbank.statistica.md/PxWeb/pxweb/ro/30%20Statistica%20sociala/30%20Statistica%20sociala_03%20FM_03%20MUN2000_MUN020/MUN020500.px/?rxid=b2ff27d7-0b96-43c9-934b-42e1a2a9a774)

For 2019 see:

[https://statbank.statistica.md/PxWeb/pxweb/ro/30%20Statistica%20sociala/30%20Statistica%20sociala\\_03%20FM\\_03%20MUN2019\\_MUN020/MUN120500.px/?rxid=b2ff27d7-0b96-43c9-934b-42e1a2a9a774](https://statbank.statistica.md/PxWeb/pxweb/ro/30%20Statistica%20sociala/30%20Statistica%20sociala_03%20FM_03%20MUN2019_MUN020/MUN120500.px/?rxid=b2ff27d7-0b96-43c9-934b-42e1a2a9a774)

Expansion of arable land, reduction of forest and pasture areas, increased erosion of slopes and desertification have negatively affected the hydrological regime of the territory. The main sources are rainwater and melt water. Water resources consist of surface water from rivers, lakes and groundwater. The total area of the reservoir is 76,214 hectares, including ponds (36,718 hectares). The largest water resources are the transboundary rivers Dniester (about 57%) and Prut (10%). The water quality in the Dniester and Prut rivers is acceptable and can be used for various purposes. The volume of surface waters and their runoff have decreased. The amount of surface water has decreased by 30-50% compared to the annual average in several important hydrographic regions (such as the Dniester and Prut rivers) and by 20-40% in hydrographic regions and small river basins. Rivers and ponds are heavily polluted with high salinity. Only 50% of the groundwater reserves meet the quality requirements. Only river

water can be used for irrigation, while inland water is mostly unsuitable. The southern part of the country has a high degree of mineralization and a greater water deficit.

The irrigation sector of the Republic of Moldova is in a precarious state and hinders the development of the agricultural sector. The Republic of Moldova has a potential of 144,600 ha of irrigated land (230,000 ha in 1990). In total, there are 78 centralized irrigation systems in the country that are located on an area of 131-688 ha. These irrigation systems have been in operation for 35-50 years. About 60% of them need rehabilitation (pumps, electrical and control panels, basins, water pipes, etc. must be replaced). Currently, only about 10-20% of irrigated agricultural land is irrigated. Organizational changes, land subdivision and privatization of hydro technical heritage have reduced the integrity and complexity of hydrological systems, significantly reducing the volume of agricultural production on irrigated land. As these factors are analysed and remedied, the demand for water in the irrigation sector is likely to increase substantially, especially given the consequences of climate change on rain-dependent agriculture. Decreasing rainfall and increasing demand for irrigation water mean that if adaptation measures are not implemented, climate change will lead to conflicts over water resources and lead to unsatisfied high demand for irrigation.

Reduced access to irrigation services due to the deterioration of state irrigation systems over the last decade is a serious impediment to the process of transition to a high-valuable agriculture and higher yields, respectively.

Analysing the indicators of the volume of agricultural production in the Republic of Moldova in the period 2010-2019, it was found that the main income received in the agricultural sector comes from the cultivation of 4 annual crops (wheat, sugar beet, corn, sunflower), pome fruits, stone fruits, table and technical wine grapes, and also meat (Table 3).

Table 3. Main agricultural products in households of all categories, thousands of tons

|   | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|------|------|------|------|------|------|------|------|------|------|
| <b>CROPS PRODUCTS</b>                       |      |      |      |      |      |      |      |      |      |      |
| <b>ANNUAL CROPS</b>                         |      |      |      |      |      |      |      |      |      |      |
| Wheat (autumn and spring)                   | 744  | 795  | 495  | 1009 | 1102 | 922  | 1293 | 1251 | 1163 | 1148 |
| Grain corn                                  | 1420 | 1468 | 572  | 1419 | 1556 | 1077 | 1392 | 1773 | 2074 | 2130 |
| Sugar beet                                  | 838  | 589  | 587  | 1009 | 1356 | 538  | 665  | 876  | 707  | 607  |
| Sunflower                                   | 382  | 427  | 296  | 505  | 548  | 485  | 677  | 804  | 789  | 811  |
| Potatoes                                    | 280  | 351  | 182  | 240  | 268  | 158  | 214  | 197  | 175  | 177  |
| Field vegetables                            | 331  | 351  | 226  | 285  | 316  | 235  | 281  | 297  | 270  | 294  |
| <b>PERENNIAL CROPS</b>                      |      |      |      |      |      |      |      |      |      |      |
| Pome fruits (apples, pears, quince)         | 1137 | 1358 | 1487 | 1998 | 2387 | 1599 | 1928 | 2677 | 3619 | 3411 |
| Stone fruits (cherry, apricot, peach, plum) | 274  | 193  | 219  | 435  | 521  | 637  | 677  | 654  | 920  | 912  |
| Table winegrapes                            | 76   | 180  | 134  | 255  | 278  | 311  | 354  | 460  | 484  | 433  |
| Technical winegrapes                        | 643  | 1144 | 1024 | 1522 | 1176 | 1144 | 1267 | 1549 | 1793 | 1433 |
| <b>LIVESTOCK PRODUCTS</b>                   |      |      |      |      |      |      |      |      |      |      |
| Sale of livestock and poultry for slaughter | 385  | 442  | 537  | 437  | 581  | 704  | 762  | 769  | 836  | 856  |
| Cow's milk                                  | 144  | 147  | 155  | 157  | 213  | 225  | 246  | 242  | 218  | 234  |
| Eggs of all kinds, millions of pieces       | 276  | 241  | 242  | 242  | 246  | 253  | 292  | 316  | 317  | 297  |

Source: developed by author according to [11]. Selected from:

For Vegetables production see:

[https://statbank.statistica.md/PxWeb/pxweb/ro/40%20Statistica%20economica/40%20Statistica%20economica\\_16%20AGR\\_AGR020/AGR020100.px?rxid=b2ff27d7-0b96-43c9-934b-42e1a2a9a774](https://statbank.statistica.md/PxWeb/pxweb/ro/40%20Statistica%20economica/40%20Statistica%20economica_16%20AGR_AGR020/AGR020100.px?rxid=b2ff27d7-0b96-43c9-934b-42e1a2a9a774)

For Livestock production see:

[https://statbank.statistica.md/PxWeb/pxweb/ro/40%20Statistica%20economica/40%20Statistica%20economica\\_16%20AGR\\_AGR030/AGR030200.px?rxid=b2ff27d7-0b96-43c9-934b-42e1a2a9a774](https://statbank.statistica.md/PxWeb/pxweb/ro/40%20Statistica%20economica/40%20Statistica%20economica_16%20AGR_AGR030/AGR030200.px?rxid=b2ff27d7-0b96-43c9-934b-42e1a2a9a774)

The analysis of the dynamics of agricultural production shows the presence of a tendency to increase the production of corn, wheat and sunflower, seeds, and meat production. (Figure 8 a, b, c).

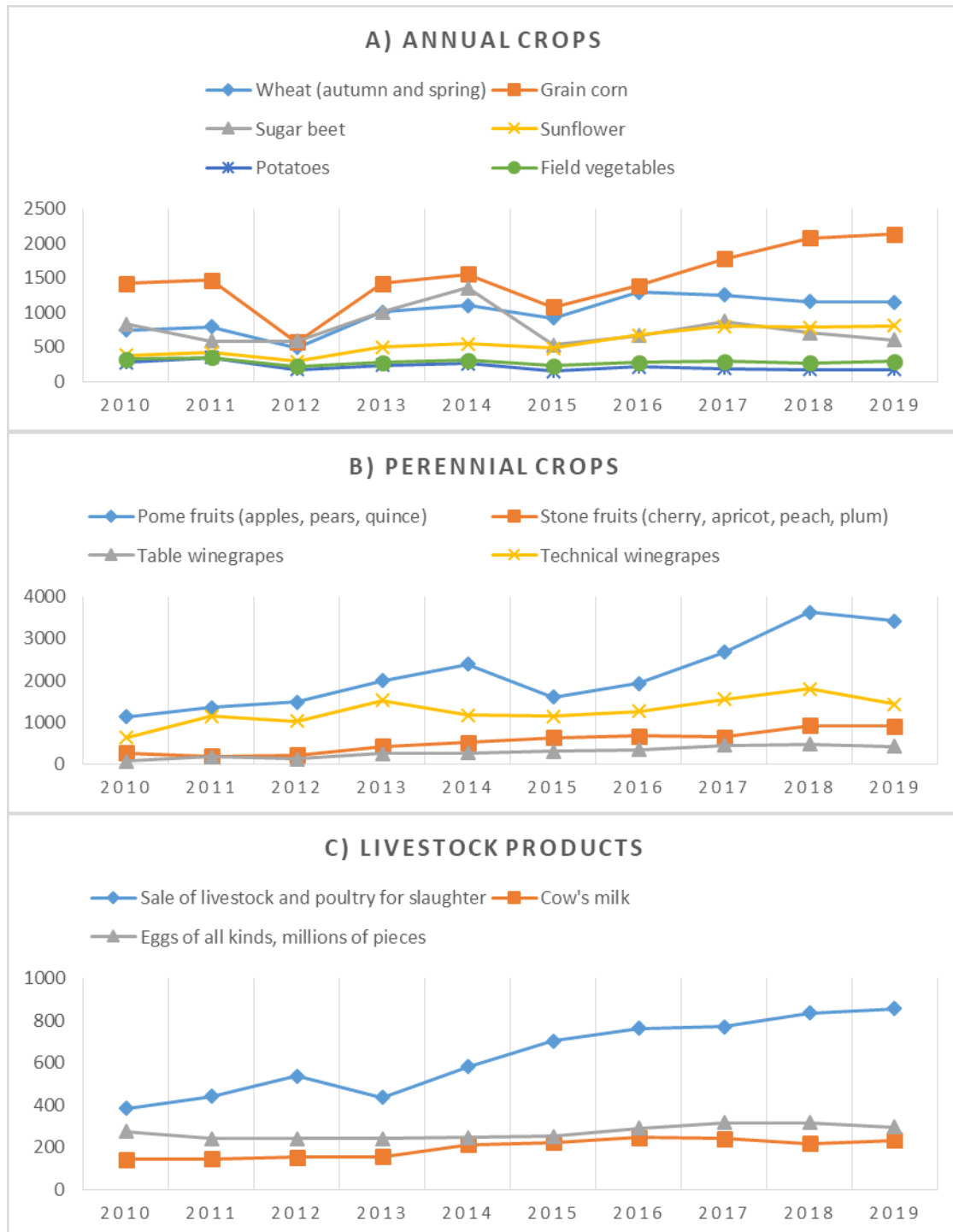


Figure 8 (a,b,c) The dynamics of main agricultural products, 2010-2019

Source: developed by author according to [11]

Selected from:

For Vegetables production see:

[https://statbank.statistica.md/PxWeb/pxweb/ro/40%20Statistica%20economica/40%20Statistica%20economica\\_16%20AGR\\_AGR020/AGR020100.px/?rxid=b2ff27d7-0b96-43c9-934b-42e1a2a9a774](https://statbank.statistica.md/PxWeb/pxweb/ro/40%20Statistica%20economica/40%20Statistica%20economica_16%20AGR_AGR020/AGR020100.px/?rxid=b2ff27d7-0b96-43c9-934b-42e1a2a9a774)

For Livestock production see:

[https://statbank.statistica.md/PxWeb/pxweb/ro/40%20Statistica%20economica/40%20Statistica%20economica\\_16%20AGR\\_AGR030/AGR030200.px/?rxid=b2ff27d7-0b96-43c9-934b-42e1a2a9a774](https://statbank.statistica.md/PxWeb/pxweb/ro/40%20Statistica%20economica/40%20Statistica%20economica_16%20AGR_AGR030/AGR030200.px/?rxid=b2ff27d7-0b96-43c9-934b-42e1a2a9a774)

The incomes of employees in the Agricultural sector are much lower than the average for the economy. Statistical data show a general discrepancy between the incomes of agricultural workers and the average level of gross wages per economy (Table 4). Despite the fact that during the period 2014-2019 there was an increase in the average gross wage in all sectors of the economy, the average wage in agriculture is only 64.4% of the average wage in the economy. Same the dynamics of growth of the average gross wage in agriculture is lower than the overall dynamics of the economy (Figure 9). This discrepancy is caused by the rapid growth of wages in other sectors of the economy.

Table 4. Average monthly gross salary by type of activity and sector of the economy, Lei MD

|  | 2014          | 2015          | 2016          | 2017          | 2018          | 2019          |
|--|---------------|---------------|---------------|---------------|---------------|---------------|
| <b>Economic activity - total</b>   | <b>4089.7</b> | <b>4538.4</b> | <b>4997.8</b> | <b>5587.4</b> | <b>6268.0</b> | <b>7233.7</b> |
| <b>Agriculture, hunting and related services</b>                           | <b>2616.3</b> | <b>2880.6</b> | <b>3172.8</b> | <b>3586.8</b> | <b>4088.4</b> | <b>4680.0</b> |
| Industry   | 4388.1        | 4855.2        | 5267.9        | 5815.8        | 6485.7        | 7151.0        |
| Construction   | 4165.7        | 4378.1        | 4843.2        | 5544.2        | 6198.2        | 7155.3        |
| Wholesale and retail trade; Maintenance and repair of cars and motorcycles | 3367.5        | 3870.6        | 4246.4        | 4901.2        | 5414.9        | 6543.9        |
| Transport and storage  | 3939.5        | 4282.3        | 4778.6        | 5313.8        | 5985.6        | 6836.2        |
| Accommodation and catering   | 2757.4        | 3043.7        | 3331.3        | 3668.0        | 4248.5        | 4973.0        |
| Information and communication  | 8404.0        | 9514.0        | 11041.6       | 12011.7       | 13620.3       | 15785.4       |
| Financial and insurance activities   | 7505.3        | 8093.5        | 10152.2       | 10743.7       | 12090.2       | 13203.5       |
| Real estate transactions   | 3583.1        | 4005.2        | 4595.8        | 4834.6        | 5119.8        | 5906.1        |

Source: developed by author according to [11]. Selected from:

[https://statbank.statistica.md/PxWeb/pxweb/ro/30%20Statistica%20sociala/30%20Statistica%20sociala\\_03%20FM\\_SAL010\\_serii%20anuale/SAL010100.px/?rxid=b2ff27d7-0b96-43c9-934b-42e1a2a9a774](https://statbank.statistica.md/PxWeb/pxweb/ro/30%20Statistica%20sociala/30%20Statistica%20sociala_03%20FM_SAL010_serii%20anuale/SAL010100.px/?rxid=b2ff27d7-0b96-43c9-934b-42e1a2a9a774)

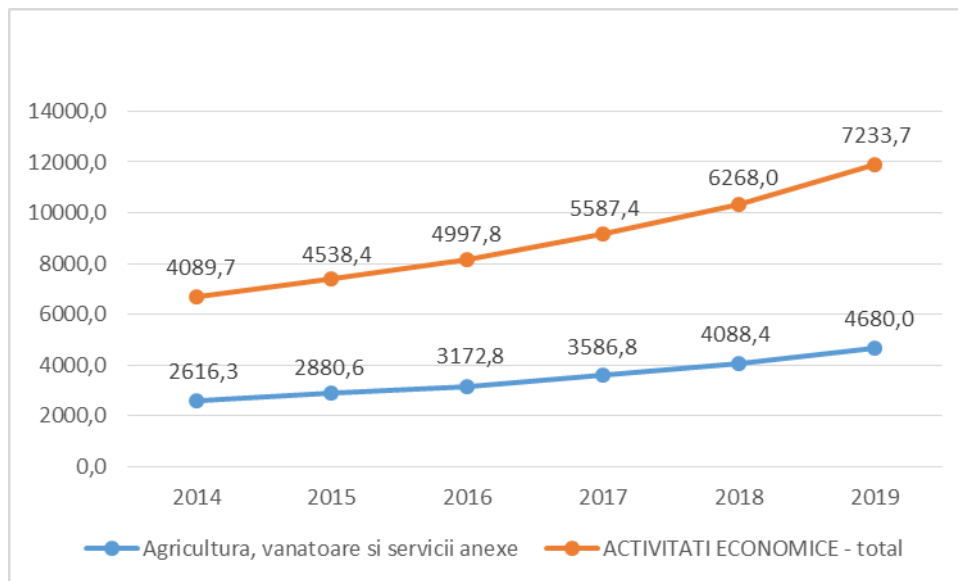


Figure 9. Dynamics of average monthly gross wages in the agricultural sector, Lei MD

Source: developed by author according to [11]. Selected from:

[https://statbank.statistica.md/PxWeb/pxweb/ro/30%20Statistica%20sociala/30%20Statistica%20sociala\\_03%20FM\\_SAL010\\_serii%20anuale/SAL010100.px/table/tableViewLayout1/?rxid=b2ff27d7-0b96-43c9-934b-42e1a2a9a774](https://statbank.statistica.md/PxWeb/pxweb/ro/30%20Statistica%20sociala/30%20Statistica%20sociala_03%20FM_SAL010_serii%20anuale/SAL010100.px/table/tableViewLayout1/?rxid=b2ff27d7-0b96-43c9-934b-42e1a2a9a774)

As a consequence of the described situation, there is a decrease in the population's interest in working in agriculture and an increase in labour migration from rural to urban areas.

In order to reduce the negative impact of the drought and to offer a support for agricultural producers, in 2010 the Republic of Moldova signed the COMPACT agreement worth about 262 million US dollars. One of the strategic projects of this program is the project "Transition to a

performed agriculture", which is aimed at rehabilitating the irrigation system, reforming the irrigation sector, providing training in agricultural facilities.

It is known that the export is an important factor that determines the competitiveness of an economy. It is highly important to determine the sectors of the national economy that in comparison with neighbouring countries registers competitive advantages.

The European Union (EU) and the Commonwealth of Independent States (CIS - predominantly Russia and Belarus) are two key vectors of Moldova's agri-food trade. The development of trade relations in these two directions takes place on the basis of the Deep and Comprehensive Free Trade Agreement (DCFTA) between Moldova and the EU, as well as the Eurasian Economic Union (EAEU) / Eurasian Custom Union (ECU) agreements, where Moldova benefits from CIS membership status.

It should be noted that until 2013, the basic market for Moldovan farmers was that of the Russian Federation. However, after the Russian Federation imposed a large number of embargoes on agri-food production of the Republic of Moldova, the Moldovan farmers lost this largest market, suffering colossal losses. For example, in 2014, according to official data, the losses suffered by Moldovan farmers in this year were amounted to about \$ 20 million, but some experts say that the losses imposed by the 2014 embargo imposed by the Russian Federation were exceed \$ 100 million.

The decline of exports to the Russian Federation can be seen "in the context of recent constraints: political crisis, restrictive measures imposed by the Russian Federation on Moldovan products, the armed conflict in eastern Ukraine, EU sanctions against the Russian Federation and mutual restrictions, the banking crisis, devaluation of the Moldovan currency (LEU), appreciation of the US Dollar exchange rate, unfavourable climatic conditions, the reduction of prices for certain products at international level, etc." [12]

Despite the European integration vector, in order to maintain the competitiveness of the agricultural sector, the Republic of Moldova must maintain trade relations with the countries of the Eurasian Customs Union, which represents a strategic partner for the Republic of Moldova, but also to penetrate another market.

Along with promoting the vector of European integration, in order to keep the competitiveness of the agricultural sector, the Republic of Moldova must maintain trade relations with the countries of the Customs Union, which is a strategic partner for the Republic of Moldova, but also to enter another market [5, p.134].

It must be mentioned that the history of Moldova' foreign trade exclusively oriented to the Eastern Customs Union (ECU) has generated many risks for the national economy, such as: dependence on one market, which is in contradiction with the general state policy which follow the purpose to develop the competitiveness of national production.

Due to a significant share of vegetable agricultural products in the exports of Moldova, as well as to valorise the opportunity to increase the competitiveness of Moldovan agricultural products through the access of own horticultural products to the EU market, as a result of signing the Trade and Association Agreement, and in order to comply with ECU import standards, it is necessary to assess the problems facing Moldova's agricultural sector.

In our opinion, the biggest problems faced by Moldovan products on export markets are related to the image of the products, quality certification, lack of a branding strategy.

Another problem that agricultural producers face is competition in the domestic market of the Republic of Moldova where domestic agricultural products are constrained by imported ones.

The Republic of Moldova imports large quantities of vegetables, especially in the off-season, ie in the cold period of the year. This is determined by the high costs of growing in the greenhouse. Thus, during the cold period of the year, due to the lack of domestic agricultural products, Moldovan consumers have to consume imported agricultural products.

Losses in the agricultural sector in the Republic of Moldova are mostly caused by the lack of refrigerating spaces, the lack of new export channels, losses associated with the appropriate packaging of agricultural products, losses associated with the consolidation of agricultural areas (by enlargement of managed lands) - that results with a reduction of the number of landowners and farmers.

At the same time, in addition to the aspects of vegetable and animal agricultural production, a sensitive issue for the competitiveness of Moldova's agriculture is the organization and cooperation of stakeholders. In the Republic of Moldova, downstream operators of the agri-food value chain, including intermediaries, processors, exporters, food retailers and other actors, have not yet been able to establish long-term relationships with "raw material" suppliers, and to recognise farmers as key business partners. Actually, most of downstream market participants prefer to buy the harvested goods or animal meat directly from the agricultural market and pay farmers the lowest possible price, while retailers prefer to import large quantities of final agri-food products to satisfy domestic final-consumption of processed agri-food production.

Table 5. SWOT analysis of the potential of the agricultural and rural sectors of the Republic of Moldova.

| STRENGTHS   | WEAKNESSES  |
|---|---|
| <ul style="list-style-type: none"> <li>• Great importance of the agricultural sector in the structure of the national economy;</li> <li>• Favourable geographical location for trade in agriculture, food industry and other manufacturing industries;</li> <li>• Existing land resources suitable for agricultural production;</li> <li>• Developed network of public Internet access, high level of Internet access;</li> <li>• The Republic of Moldova is located at the main crossroads of trade routes for fresh products;</li> <li>• Favourable conditions for the development of organic agriculture;</li> <li>• Tradition and experience in the production of wine, fruits and vegetables</li> </ul>  | <ul style="list-style-type: none"> <li>• Weak promotion of investments and poor financing of the sector;</li> <li>• The dominant position of low-value crops in agricultural production;</li> <li>• Fragmented and inefficient livestock production;</li> <li>• Lack of horizontal and vertical coordination of supply chains, poorly structured producer organizations;</li> <li>• Difficulties in complying with safety and quality standards for agri-food products;</li> <li>• Agricultural education and agricultural research system are not adapted to the current situation;</li> <li>• Low productivity and fragmented dual structure of agricultural holdings;</li> <li>• Decrease in soil quality, erosion;</li> <li>• Poor condition of irrigation systems and small areas of irrigated land;</li> <li>• Poorly developed infrastructure and services in rural areas;</li> <li>• Decline in the level of employment in rural areas;</li> <li>• Weak participation of the local community in promoting rural development.</li> </ul> |
| OPPORTUNITIES   | THREATS   |
| <ul style="list-style-type: none"> <li>• Development of production and sales systems in the domestic and foreign markets;</li> <li>• Increased demand for organic products of exceptional quality in the domestic and foreign markets;</li> <li>• Increased need for food security in the world;</li> <li>• Development of cooperation between manufacturers;</li> <li>• Development of energy technologies based on biomass in rural areas;</li> <li>• Development of research, innovation, consulting and demonstration services with practical benefits;</li> <li>• Afforestation of abandoned lands and low-quality soils;</li> <li>• Strengthening international and territorial cooperation;</li> <li>• Public orientation towards alternative activities in rural areas;</li> <li>• Favourable environment for small and medium-sized businesses, as well as for family businesses.</li> </ul> | <ul style="list-style-type: none"> <li>• Increased competition in international and local markets and their instability;</li> <li>• unstable international economic situation;</li> <li>• Negative changes in the rural landscape;</li> <li>• Climate change, increased frequency of extreme weather events;</li> <li>• Immigration and "brain drain" from rural areas due to more favourable working and living conditions in cities and in the international labour market;</li> <li>• Increase in the number of socially vulnerable people and families;</li> <li>• Outbreaks of infectious diseases of plants and animals.</li> </ul>   |

Source: [12]

Therefore, these market failures have so far prevented the efficient transmission of market signals to the farm level and have delayed the integration of farmers into the vertical of a coordinated supply chains [12]. The poorly developed organizational structure of producers in the Republic of Moldova disadvantage farmers to access the market. Another weakness is the lack of supporting organizations for farmers (such as voluntary associations) aimed to improve their market access. Farmers in the Republic of Moldova, especially small producers, generally do not have the necessary "group power" able to integrate them into the market by increasing deliveries, setting better prices with buyers or jointly owning post-harvest facilities.

The lack of cooperation and organization of farmers in the Republic of Moldova continues to hinder their ability to integrate into supply chains and take full advantage of potential market opportunities. On the other hand, manufacturers have few resources to increase the value of their products (through storage, packaging, etc.). They have low bargaining power with buyers due to small volumes and variability of stocks, lack of suitable vehicles, etc.

While the processing industry can add value to agricultural products, this growth is hampered by the lack of private investment in the agri-food processing sector. Agricultural processing companies face severe constraints in many areas, including technology, equipment, finance, management, marketing, logistics, regulatory burden, and corruption. In addition, a competitive agri-food processing sector can transfer modern agricultural and information technologies directly or indirectly.

At the same time, climate and environmental change is also an important issue. Severe droughts occur every two to three years. It is very important to develop tools to mitigate the risks associated with weather conditions. Climate change could further reduce the amount of water available. Irrigation systems in rural areas often do not work. The lack of wastewater treatment processes leads to high levels of water pollution in these regions. Soil degradation is another major concern, with 50% of agricultural land classified as degraded. Unsustainable agricultural practices, inadequate water management and degradation of protective forests are important obstacles to the development of the sector. A small proportion of forest areas (about 12%) contributes to soil degradation and flooding. Land lease rules seem to perpetuate land degradation, as short-term land leases do not encourage their users to protect the environment, as they are primarily interested in maximizing land benefits in the short term.

The analysis of strengths, weaknesses, opportunities and threats (SWOT) presents the external factors (opportunities and threats) and internal (strengths and weaknesses) that characterize the current potential of the agricultural and rural sectors of the Republic of Moldova and indicate the weak areas (Table 5) [12].

### Some strategic goals to provide competitiveness

Competitive strategy implies the search for an advantageous competitive position in the industry where economic competition takes place. [34, p.15].

Starting from the vision of Igor Ansoff, who defines the strategy as a set of decision criteria that guide the behaviour of an economic agent to achieve the effectiveness of its activity [8, p.110], it is appropriate to promote **a set of goals focused to increase the competitiveness of the agricultural sector of the Republic of Moldova.**

**1. Diversification.** The diversification strategy means the launch of a new activity, different from the current activity of the company, that is, a new product sold in a new market, taking into account a new set of key factors, more or less successful, and exploiting (more or less successfully) elements of the synergy occurring in the main activity of the company [3, p.204].

The ways of diversification are [6, p.97]:

- **geographic diversification** - when a company leaves its market and enters another zone where the key success factors are different (especially networks and distribution rules may be different), leading, sometimes, the enterprise to change the vision about its activity;

- **vertical diversification** (integration of upstream and downstream) offers the company new strategic advantages, such as: reliability of supply (upstream), outflow (downstream), lower production and distribution costs, various opportunities (including different) with competition, etc. .;



- **horizontal diversification** (internal development through investments or external development through purchases or partnerships with other companies), based on synergy and complementarity, determines the company's approach to the main areas of activity.

**2. Development and modernization of agri-food chains** to comply with EU food safety and quality requirements.

First, it is necessary to stimulate the orientation of agricultural holdings towards the production of certain final products in the value chain. Depending on this, technologies, varieties and types of agricultural, vegetable or livestock products will be adapted.

Secondly, support is needed for the modernization and restructuring of farms specializing in the production of traditional agricultural products (fruits and vegetables, milk, meat), as well as other competitive agricultural products.

Third, agri-food companies must be supported by investment in modern technology to meet EU food quality and safety requirements.

Fourth, cooperation between primary agricultural producers and other representatives of the agricultural business (processors, wholesalers, retailers) should be strengthened in order to increase income opportunities and ensure access to Moldovan agri-food products in the national and international markets.

**3. Facilitating farmers' access to markets of capital, inputs and outputs.** Current investment support programs provide important tools for improving farmers' access to capital. In order to improve farmers' access to funds, some measures should be taken to:

- creation of an operational basis for transactions with secured goods (guarantee funds, certificates of deposit);
- stimulating the land market to turn the country into a more liquid and attractive asset for banks;
- reduction of agricultural risks through measures to reduce natural risks and insurance against them.

On the other hand, an open import regime for seeds, fertilizers and pesticides will give local producers greater access to modern technology and help them compete with European producers.

Similarly, farmers' access to product markets, which is especially problematic for small and medium-sized producers, can be improved by:

- a) supporting the integration of farmers into supply chains, that will facilitate their links with downstream operators, including processors, wholesalers and retailers;
- b) association of producers in order to enable and improve the access to post-harvest infrastructure and the facilitation of market access.

Currently, the Organization for the Development of the Small and Medium-sized Enterprises Sector (ODIMM) implements several programs aimed to training, facilitating of access to finance, setting up and developing small and medium-sized enterprises by migrants and women, and exchanging experience. For rural areas ODIMM has a special support program "Small and Medium Enterprises in Rural Areas", which is a continuation of 2 national entrepreneurship support programs: the program to attract remittances in the economy "PARE 1 + 1" and the Program "Women in business".

**4. Ensuring the sustainable management of natural resources in agriculture.** Even it has fertile soils and a favourable climate for agricultural production, the Republic of Moldova faces several environmental challenges. Therefore, adapting to climate challenges is a priority. This issue should include improving farmers' access to new drought-resistant varieties, non-destructive farming technologies, research and training in innovative water and soil management and access to climate information (especially on extreme events). Risk management tools in agriculture need to be evaluated and developed, including insurance against natural risks in agriculture and the application of hail systems.

The National Environmental Fund is currently supporting investments in water supply and sewerage infrastructure and network development. Also, the National Fund for Regional Development finances investments in the development of regional water supply, water treatment and sewerage systems, in the rehabilitation, expansion, modernization of water supply and sewerage infrastructure in the amount of 8 - 40 million Lei MD.

**5. Support green production technologies, green products, including biodiversity.** This strategy follows another way to ensure sustainable management of natural resources in agriculture by providing environmentally friendly production technologies and products. Regarding this, organic production should be supported, especially as the demand for such products in international markets is growing. Organic farmers should be assisted in their efforts to meet standards and implement procedures set by international markets and organizations.

In order to establish an exhaustive and uniform legal framework on granting subsidies in the agro-industrial sector and for rural development, the importance of supporting local agricultural producers and the need to adapt the legal regulatory framework in the field of agricultural subsidies to EU practices, the Parliament of Moldova adopted Law no. 276/2016 on the principles of subsidizing agricultural producers [7]. Taking into account the main areas of application of this law, it will be necessary to implement a number of adjustments to the monitoring and decision-making mechanisms in order to gradually align them with EU requirements.

**6. Development of physical and service infrastructure in rural areas.** Such public support is needed to improve physical infrastructure and rural services by investing in the renovation and reconstruction of water supply and sewerage systems, telecommunications lines, electricity and local roads, to facilitate the development of the agri-food sector.

Currently, the National Road Fund finances the maintenance and reconstruction of state and local public roads. Money for the maintenance and reconstruction of local public roads (including village streets) is transferred to the management of the local authorities of the second level. It should be noted that the limited capacity of the state budget of the Republic of Moldova does not allow the construction of new roads at the expense of the National Road Fund.

On the other hand, the National Regional Development Fund finances the rehabilitation and modernization of local roads, the connection of local settlements and roads to the national and international road network, as well as the construction / rehabilitation / modernization of ring roads with investments of 10-70 million Lei MD.

Likewise, the National Fund for Agriculture and Rural Environment is funding small local projects to build / rehabilitate local roads (streets) in rural villages and local roads that connect villages to surrounding village farms and agricultural processing enterprises.

#### **4. Conclusions**

Analysing the current situation in the agricultural sector of the Republic of Moldova, we can conclude that agriculture plays a very important role in the country's economy. The goal to increase the competitiveness of the agricultural sector will be possible to achieve being remove the restrictions on the development of the industry from the Republic of Moldova, which will be possible due to the use of modern equipment in the process of production, construction and post-harvest infrastructure; ensuring irrigation conditions; conquering new markets, as well as diversifying production etc.

The marketing problem for Moldovan agricultural products is very tight, because the local market is very small, so it is necessary to diversify the market in order to create as many opportunities as possible for Moldovan companies in favour of a scale and competitive economy.

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**ANALYTICAL REFERENCES REGARDING THE PROMOTION OF THE RIGHT  
"PROTECTION OF MOTHER, CHILD AND YOUNG PEOPLE"**

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**Abstract:** *States have made legal and political commitments to special protection for women, children and young people through the expressed human rights through their national laws and membership of international human rights treaties.*

*This research paper aims to analyse the global situation regarding safe motherhood, children and young people using the indicators recommended by The Global Framework of Indicators for Sustainable Development Goals.*

This research paper is developed within the project "Human Rights in the Republic of Moldova: financial dimension and consolidation through the efficient public expenditures management" (code 20.80009.0807.35).

**Key words:** *safe motherhood, children, young people, human rights.*

**JEL classification:** B54, J13, K38.

**UDC:** 341.231.14 (478)

### **1. Introduction**

According to the Universal Declaration of Human Rights (art. 25) [6] adopted in 1948, and the Constitution of the Republic of Moldova (art. 50), mothers, children and young people have the right to special assistance and protection [1]

The sources of promoting a safe motherhood are found in the human rights specified in all national constitutions and in international and regional human rights treaties, based on the Universal Declaration of Human Rights. The Universal Declaration itself was not proposed as an enforceable legal instrument, but gained legal acceptance and legal applicability through a number of international human rights conventions.

The main modern human rights treaties that also concern the rights of mothers are:

- Convention on the Elimination of All Forms of Discrimination against Women. This Convention expresses the values implied in the Universal Declaration of Human Rights and strengthens the two initial implementing covenants of the Universal Declaration [2];
- International Convention on the Elimination of All Forms of Racial Discrimination;
- Convention on the Rights of the Child.

Regional conventions on human rights are also inspired by the Universal Declaration.

Like national constitutions that have constitutional courts to monitor compliance with constitutional provisions, human rights treaties have special bodies to monitor compliance with treaty provisions. For example, the Women's Convention established the Committee on the Elimination of Discrimination against Women (CEDAW).

At the same time, the Declaration of the Rights of the Child, adopted by the UN on November 20, 1959, plays a decisive role in the protection of the rights of the child.

The declaration proclaims that every child must benefit from a social protection, granted by law, capable of ensuring a healthy development, physically, intellectually, morally, spiritually and socially, in conditions of freedom and dignity. Moreover, every child has the right to name and nationality, to social security, including food, housing, leisure and medical care, to a harmonious development of his personality. In addition, every child has the right to free and compulsory elementary education, to protection from any form of cruelty and exploitation, the right to protection against racial, religious or other discrimination. Finally, the declaration stipulates the right of children

with disabilities to treatment, education and care necessary for their condition.

Unfortunately, young people lack an official document that would specify the particularities of their rights, balancing their status between childhood and adulthood. However, the Joint Council on Youth, the central co-managed political body of the youth sector of the Council of Europe, defines a wide range of the strategic priorities of youth sector for the period 2022-23. In this context, the core areas of human rights protection of young people are:

➤ ***supporting young people's participation*** (in political processes; in decision-making processes at local level; in associations; in combating the climate crisis in artificial intelligence and Internet governance processes);

➤ ***information and education of young people*** (continuing the Human Rights Education Youth Programme, supporting and developing information, data and media literacy with children and young people, increasing the understanding and addressing the impact of the Covid-19 pandemic on young people and the exercise of social rights, including physical and mental health, mainstreaming rights-based approaches in youth policies, programmes and projects);

➤ ***social inclusion and non-discrimination for young people*** (Roma youth participation and combating antigypsyism, social inclusion of young refugees, enabling young people to promote peaceful societies, peacebuilding and conflict transformation, co-operation with neighbouring, volunteering and solidarity actions at local, national and regional and international levels, mainstreaming inclusiveness, equality and intersectionality, enhancing the inclusion and participation of young people in the rural communities);

➤ ***promoting youth work agenda*** (supporting the access to quality development and recognition of youth work and non-formal education and learning, pursuing quality development and innovation (including digitalisation) in the capacity-building activities of the Youth Department).

## **2. Applied research methodology**

This research applies Global indicator framework for the Sustainable Development Goals [4] as a tool for analyzing the human rights situation in the context of the promotion of the right "protection of mother, child and young people".

Identifying the causes of maternal mortality and morbidity are considered essential benchmarks in promoting safe motherhood from the perspective of respect for human rights. The Global Framework of Indicators for Sustainable Development Goals recommends the following indicators related to the concept of motherhood:

- Maternal mortality rate (indicator 3.1.1.);
- Rate of births attended by qualified medical staff (indicator 3.1.2.).

In line with the objectives of the 2030 Agenda for Sustainable Development, these indicators allow the monitoring of Objective 3.1. expected to be achieved by 2030 - reducing the global mortality rate to less than 70 deaths per 100,000 live births.

Futhermore, The Global Framework of Indicators for Sustainable Development Goals specifies several objectives and indicators relate to children's rights:

- Objective 1. Reduce poverty in all its forms everywhere, evaluated by the indicators: „1.2.2 Proportion of men, women and children of all ages living in poverty according to national definitions” and „1.3.1 Proportion of the population covered by social protection systems, by sex, distinguishing between children, the unemployed, the elderly, people with disabilities, pregnant women, newborns, victims of accidents at work and the poor and vulnerable”;
- Objective 2. End hunger, achieve food security and improve nutrition and promote sustainable agriculture, analized by the indicators: „2.2.1 Prevalence of stopping growth (height for age <- 2 standard deviation from the median of the World Health Organization (WHO) Raising standards for children) among children under 5 years of age” and „2.2.2 Prevalence of malnutrition (weight for height > +2 or <-2 standard deviation from the median WHO Standards for Parenting) in children under 5 years of age, by type (dissipation and overweight)”;
- Objective 3. Ensuring a healthy life and promoting the well-being of all at all ages, evaluated by the indicators: „3.2.1 Mortality rate under 5 years” and „3.2.2 Neonatal mortality rate” and

„3.8.1 Coverage of essential health services (including reproductive, maternal, newborn and child health)”;

- Objective 4. Ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for all, represented by the indicators: „4.1.1 Proportion of children and young people at different educational levels” and „4.2.1 Proportion of children under 5 who are developing in health, learning and psychosocial well-being by sex”;
- Objective 8. Promoting sustained, inclusive and sustainable growth, full and productive employment and decent work for all, evaluated by the indicator „8.7.1 Proportion and number of children aged 5 to 17 employed in child labor, by sex and age”;
- Objective 11. Inclusive, safe, resilient and sustainable cities and human settlements, analyzed by the indicators: „11.2.1 Proportion of the population with convenient access to public transport, by sex, age and persons with disabilities” and „11.7.1 Average share of built-up area of open-air cities for public use for all, by sex, age and persons with disabilities”
- Objective 16. Promoting peaceful and inclusive societies for sustainable development, ensuring access to justice for all and building efficient, accountable and inclusive institutions at all levels, represented by the indicators: „16.2.1 Proportion of children aged 1 to 17 who have suffered physical punishment and / or psychological aggression by carers in the last month” and „16.2.2 Number of victims of trafficking in human beings per 100,000 inhabitants, by sex, age and form of exploitation”.

Apart from this, The Global Framework of Indicators for Sustainable Development Goals recommends the following indicators related to the young people:

- The proportion of children and young people at various educational levels (indicator 4.1.1.);
- Participation rate of young people and adults in formal and non-formal education and training in the last 12 months, by sex (indicator 4.3.1.);
- Proportion of young people and adults with information and communication technology (ICT) skills, by type of skills (indicator 4.4.1.);
- Proportion of young people (aged 15 to 24) who are not in education, employment or training (indicator 8.6.1.);
- Existence of a national strategy developed and operationalized for youth employment, as a separate strategy or as part of a national employment strategy (indicator 8.b.1.);
- Proportion of young women and men aged 18 to 29 who have experienced sexual violence up to the age of 18 (indicator 16.2.3.).

### **3. Obtained results and discussion**

According to UN estimates, the overall maternal mortality ratio, from 2000 to 2017, decreased by 38% - from 342 deaths to 211 deaths per 100,000 live births, the average annual reduction rate reaches 2.9%. Although it is substantial, it is less than the half of the annual rate of 6.4% needed to reach the global sustainable development target of 70 maternal deaths per 100,000 live births.

The analysis of the data for the region "Europe" according to the classification of the World Health Organization, which includes about 50 countries, both in the European Union and the CIS countries and those that are no longer part of these bodies, shows that the recorded level of Maternal deaths per 100,000 live births is below the expected level according to the strategic objectives of sustainable development, the highest level being recorded in Kyrgyzstan (2017) of 60 maternal deaths per 100,000 live births. In the Republic of Moldova this indicator has reached the level of about 20 maternal deaths per 100,000 live births (Figure 1).

At the same time, the analysis of the data in dynamics, namely for the period 2000-2017 reveals that the average rate of change of this indicator is negative, which we see as a positive trend, as it demonstrates the improvement of safe maternity conditions for women in the region "Europe". In the same context, we note that in countries such as Belarus, Kazakhstan, the maternal mortality rate has fallen, on average, by more than 10%. In the Republic of Moldova, this rate decreased by 4.72% in the period of 2000-2017.

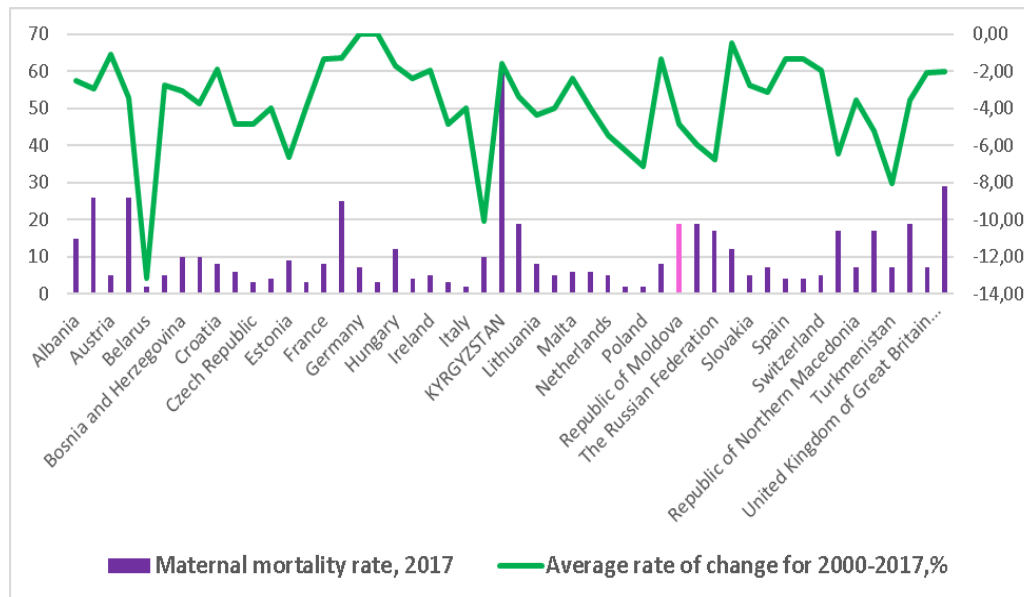


Figure 1. Maternal mortality rate per 100,000 live births in 2017 compared to the average rate of change in the period 2000-2017 for the geographical region of the World Health Organization "Europe" in 2017

Source: developed by the author based on data provided by the World Health Organization  
<http://mmr2017.srhr.org/>

The analysis of the birth rate in which qualified medical staff participates reveals limited access in the regions of the world - Central and West Africa, South-East Africa and South Asia, where the rate is below the global average of 81% (Figure 2). Regarding the "Europe" region, the average rate reaches the level of 99%, and the analysis by country indicates a variation between 95-100% (Figure 3).

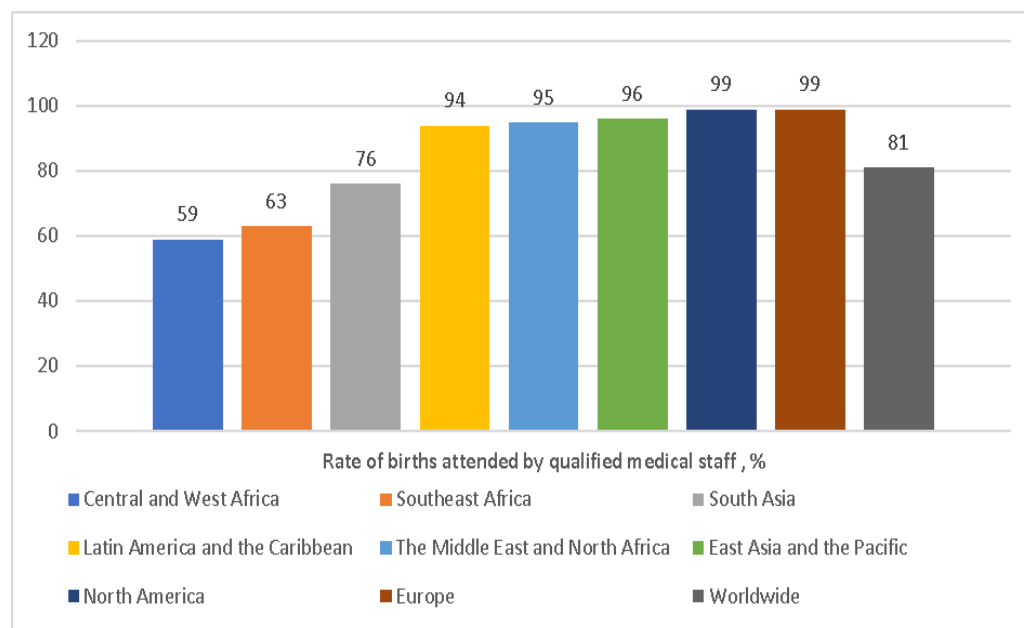


Figure 2. Level of birth rate attended by qualified medical staff by region, %

Source: developed by the author based on data provided by the UNICEF  
<https://data.unicef.org/topic/maternal-health/delivery-care/>

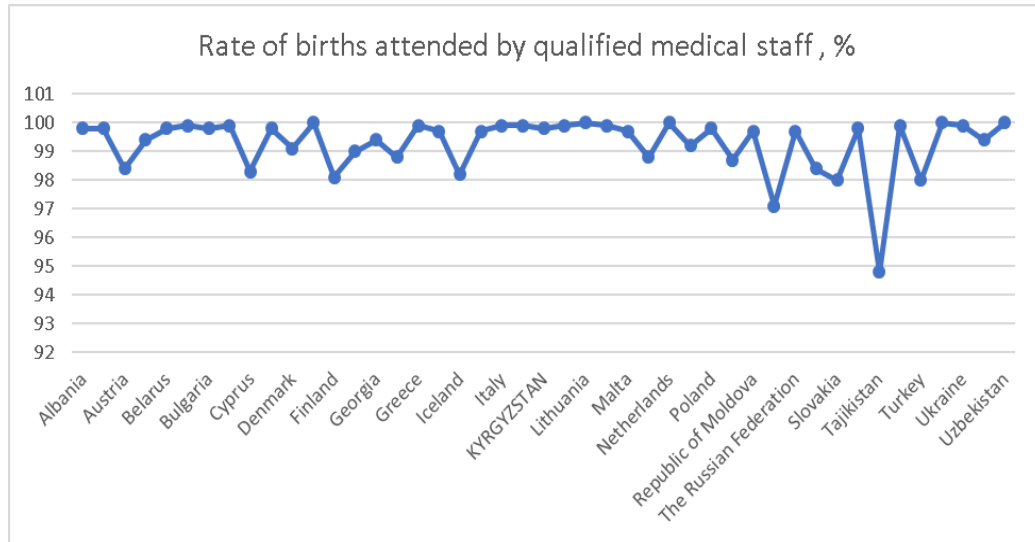


Figure 3. Level of birth rate attended by qualified medical staff for the geographical region of the World Health Organization "Europe" in 2017, %

Source: developed by the author based on data provided by the World Bank <https://data.worldbank.org>

Almost half of all deaths in children under 5 are attributed to malnutrition, which increases the risk of dying from common infections, as well as increasing the frequency and severity of these infections and delaying recovery. Poor nutrition in the first 1,000 days of a child's life can also lead to low growth, which is associated with impaired cognitive abilities and poor performance at school and work [5]. The global socioeconomic crisis caused by the COVID-19 pandemic pushed 130 million more children into monetary poor households by the end of the 2020. According to projections for 2021, the total number of children living in poor households globally could reach just over 725 million in the absence of any mitigating policies or could be reduced at most to 700 million. Nearly two-thirds of these children live in sub-Saharan Africa and South Asia (Figure 4).

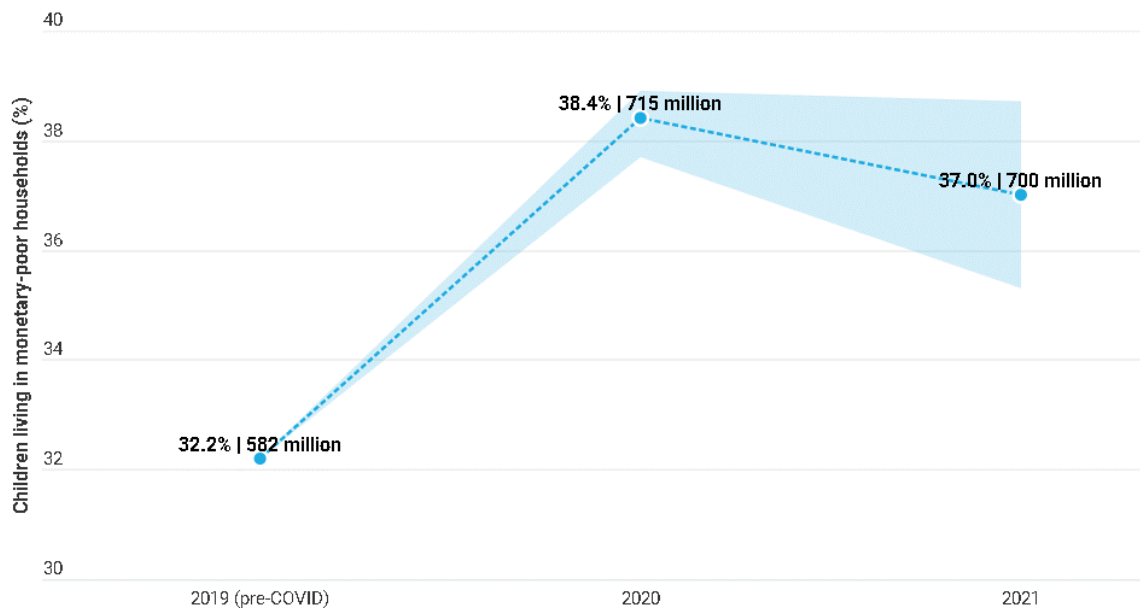


Figure 4. Prevalence and number of children living in monetary-poor households, 2019 – 2021 (projected)

Source: *Children in Monetary Poor Households and COVID-19; Projections as of November 2020.*



In 2019, 21.3 percent, or more than one in five children under the age of 5 worldwide, saw a small increase. Analyzing the data from the years 2000 and 2019, we notice that the prevalence of decreasing the decrease globally decreased from 32.4% to 21.3%, which we appreciate positively, and the number of affected children decreased from 199.5 million to 144.0 million. Worrying data on child malnutrition come from South Asia and sub-Saharan Africa.

In 2019, globally, 47 million children under the age of five lost weight (6.9%), of which 14.3 million experienced severe weight loss (2.1%). In 2019, more than half of children whose weight has fallen below normal limits come from South Asia and a quarter from sub-Saharan Africa. The high prevalence of weight loss in South Asian children of 14.8% urgently requires intervention with appropriate treatment programs [5].

Regarding overweight prevalence, the 2019 data show that the highest level of prevalence was recorded in the Middle East and North Africa - 11%, followed by Eastern Europe and Central Asia with 10.8% and North America with 8.9%. The lowest overweight prevalence in 2019 was found in South Asia, 2.5%, followed by West and Central Africa, 2.6% (Figure 5).

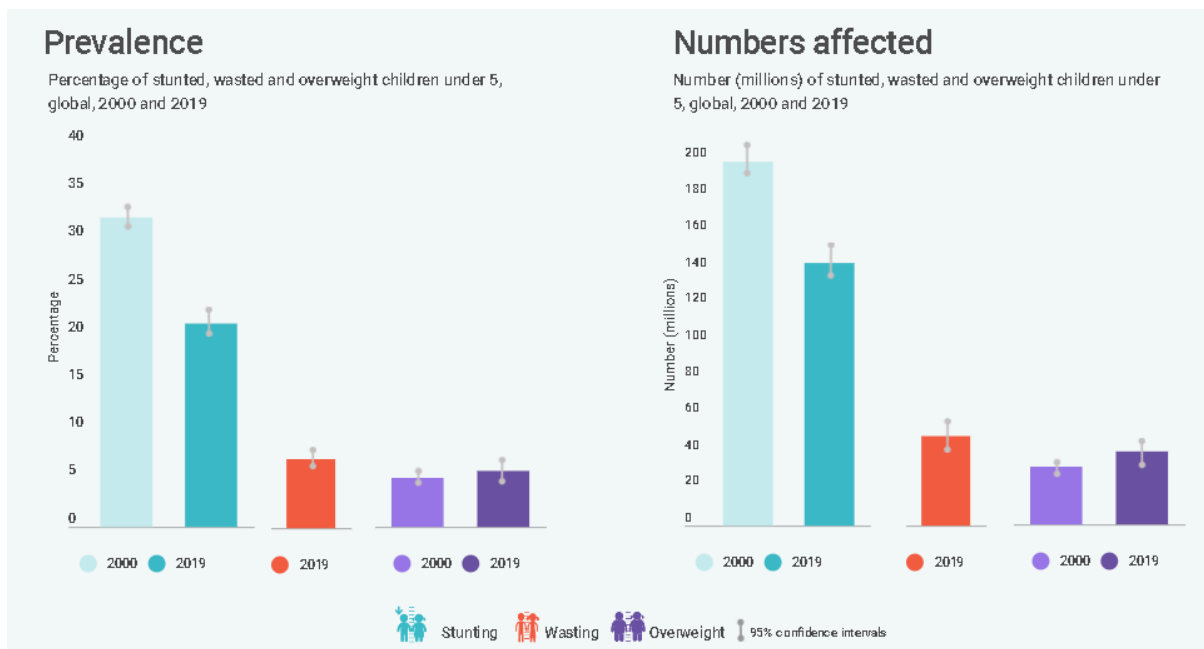


Figure 5. Malnutrition prevalence in 2000 and 2019

Source: UNICEF, WHO, World Bank, Joint Malnutrition Estimates, March 2020 edition.

East Asia and the Pacific had the highest number of overweight children in 2019, with 10.4 million affected, followed by the Middle East and North Africa, with about 5.4 million overweight. Overall, the two Asian regions (East and Pacific Asia and South Asia) account for almost two out of five overweight children in the world. North America is the only region that has seen a statistically significant increase in the number of overweight children between 2000 and 2019.

Most regions of the world reduced the under-5 mortality rate by at least half between 1990 and 2019. Of all countries, 44% (85 countries) reduced their under-5 mortality by at least two-thirds during this period, 34 of them are low- and middle-income countries, indicating that while the burden of infant mortality is unevenly distributed around the world, improving the survival of children is possible even under resource-constrained conditions. Children continue to face regional and income disparities in terms of chances of survival, with the highest level of under-5 mortality in Africa - 76 deaths per 1,000 live births (Figure 6).

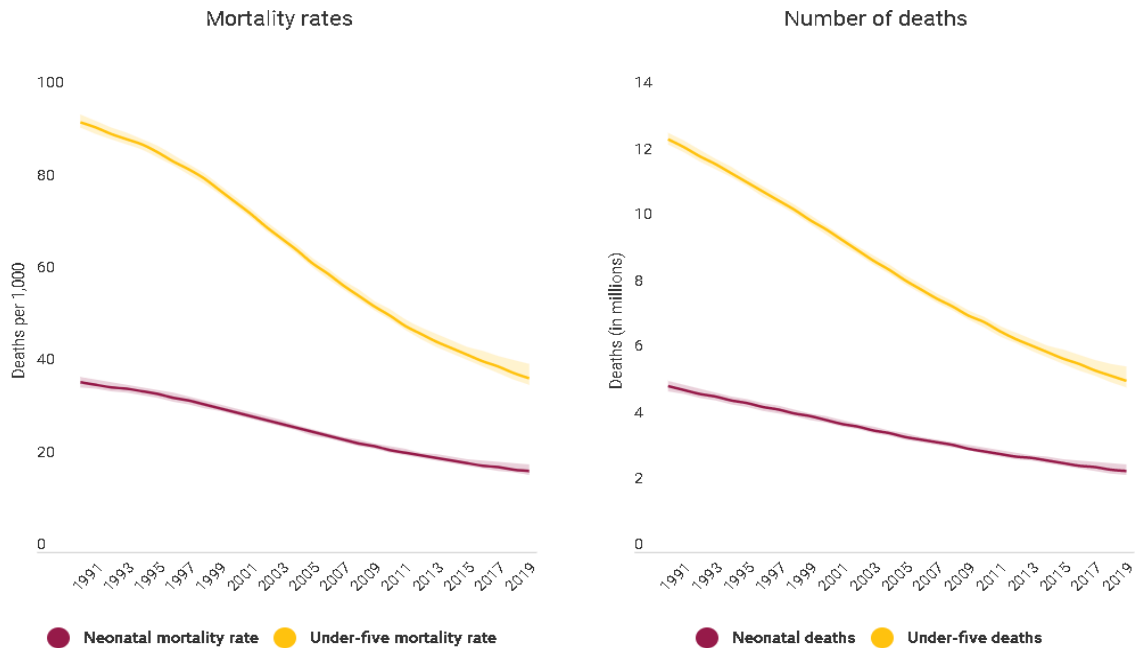


Figure 6. Global mortality rates and number of deaths by age, 1990–2019  
 Source: United Nations Inter-agency Group for Child Mortality Estimation (UN IGME) 2020.

The number of illiterate children and young people aged 5-24 decreased from 180 million to 100 million during the years 1985-2018, at the same time, noting that the higher level of illiteracy is among girls, but we find that gender disparity decreased considerably during the analyzed period (Figure 7).

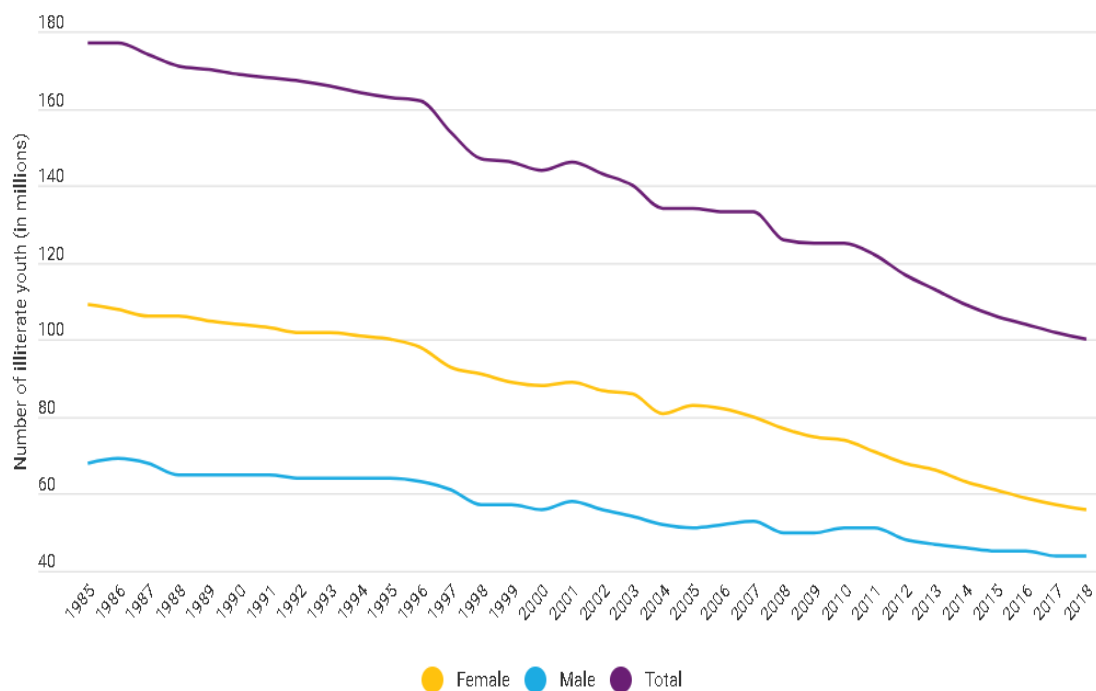


Figure 7. Number of illiterate youth (aged 5-24 years) worldwide, 1985-2018, in millions  
 Source: UNESCO Institute of Statistics Global Database, 2019

Migration data show a worrying situation, if the share of children aged 0-17 in the total number of migrants (including refugees) is about 12%, then this share among refugees reaches the level of 50%. Thus, we find that a large part of those who suffer the consequences of armed conflict are children, which increases the risks related to their health and even their lives (Figure 8).

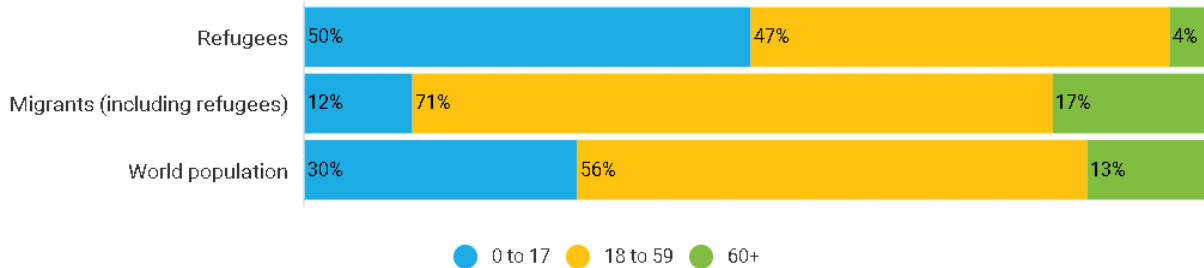


Figure 8. Age distribution of refugees (2018), international migrants (2019) and total population (2019) (percentage)

Source: UNICEF analysis

While global youth literacy rates have risen since 2000, gender disparities persist, with women accounting for about 56% of today's illiterate youth population. Sub-Saharan Africa, the Middle East and North Africa and South Asia face the largest gender gap in youth literacy. The largest gender differences in youth literacy occur in West and Central Africa to the detriment of young women (Figure 9).

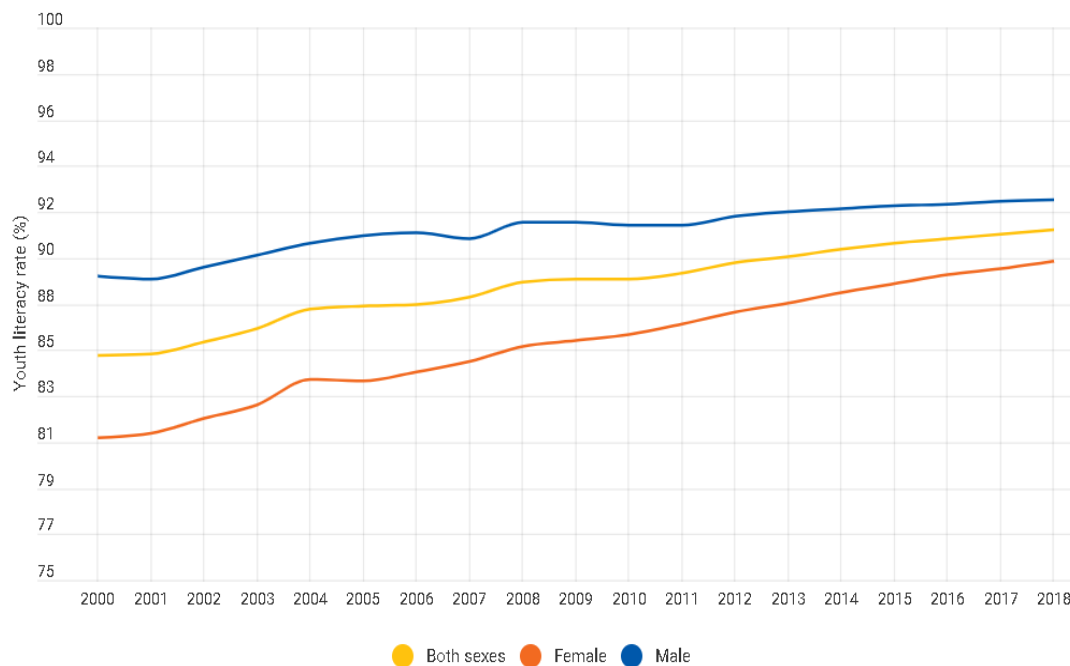


Figure 9. Youth literacy rate (ages 15 to 24 years), by sex, 2000-2018

Source: UNESCO Institute of Statistics Global Database, September 2019.

Data on youth participation, inclusion and development are quite limited, as global levels of dynamics are not available to determine the trend towards the situation with young people.

At the level of the European Union, we point out that the share of people aged 15-34 tends to increase in recent years, but only a quarter of these young people are involved in the educational training system (Figure 10).

At the same time, we note that the rate of young people aged 15-29 who are not involved in

the education system or employed decreased in the period 2010-2019, which is considered as positive trend, as it increases the chances of young people to better social inclusion and decent standard of living (Figure 11).

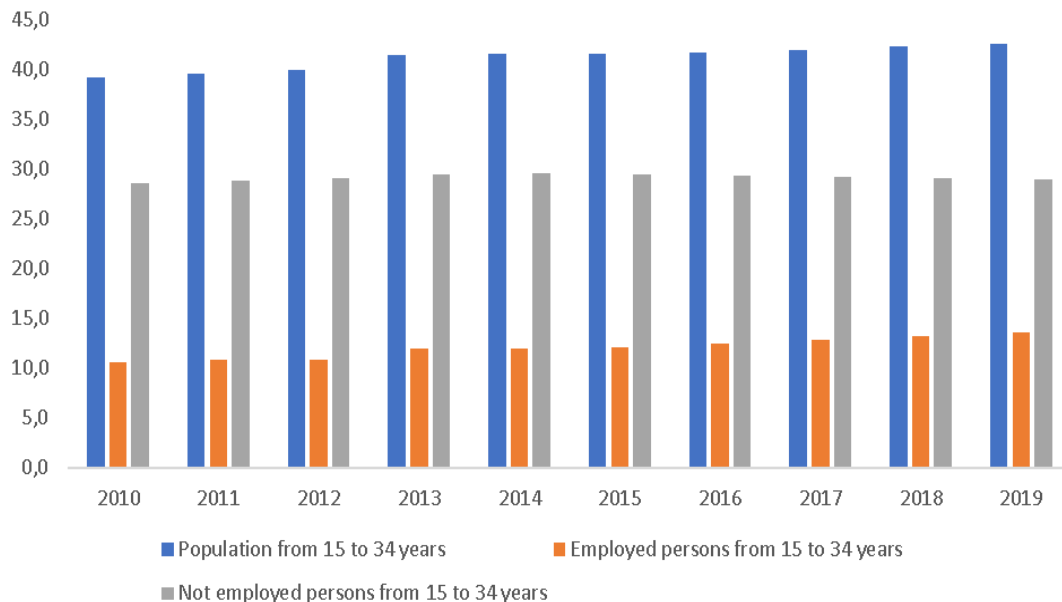


Figure 10. Participation rate of young people in education and training in European Union, %  
 Source: developed by the author based on data provided by the EuroStat  
[https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=edat\\_lfse\\_18&lang=en](https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=edat_lfse_18&lang=en)

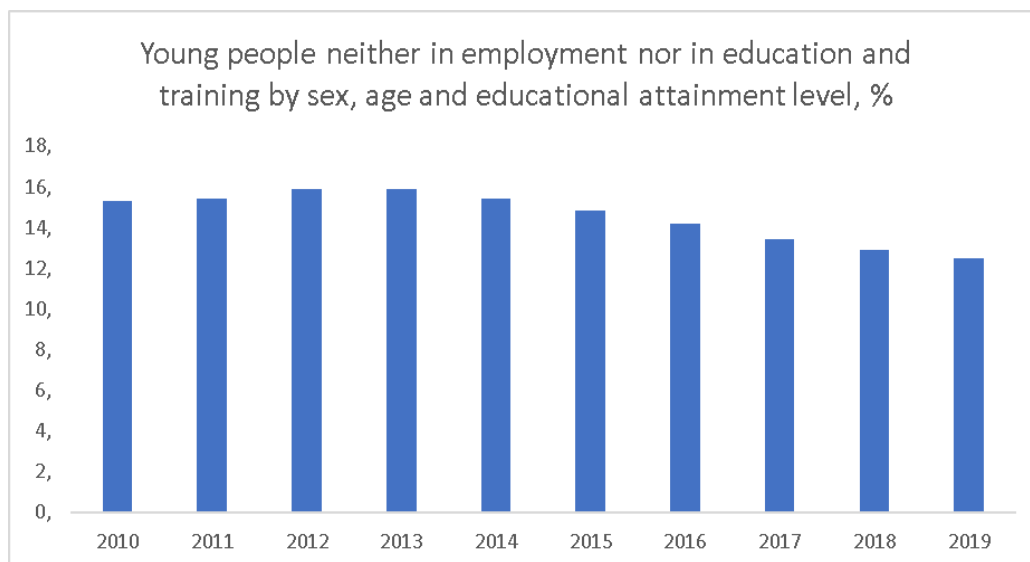


Figure 11. Proportion of young people (aged 15 to 29) who are not in education, employment or training in European Union, %  
 Source: developed by the author based on data provided by the EuroStat  
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In our opinion, the analytical approach of the concept of „safe motherhood” can not be limited only by two indicators presented above. The international practice considers that safe motherhood has to be ensured and promoted through several specific legally established human rights. Several human rights can be applied cumulatively and interactively to promote the particular interests of mothers, namely:

- a) *Rights related to life, survival and security of the person;***
- b) *Maternity and health rights;***
- c) *Rights to non-discrimination and due observance of differences;***
- d) *Rights related to information and education.***

**a) *Rights related to life, survival and security of the person* refer to:**

✓ *The right to life and survival*, which is the most obvious right that could be applied to protect a woman at risk of death at birth due to lack of obstetric care. The right to life is interpreted in the European Convention not only to require states to take measures to prevent intentional killing, but also to take the necessary measures to protect life against unintentional loss.

✓ *The right to freedom and security of the person* is one of the strongest defenses of individual integrity and the right of women to free choice of motherhood.

✓ *The right to be free from inhuman and degrading treatment*. The decisions of human rights tribunals have required states to ensure that health services are provided when denying them would constitute inhuman treatment.

**b) *Maternity and health rights* include:**

✓ *Maternity rights*, which have been developed through interdependent rights that require maternity protection in general, maternity protection during employment in particular, the rights to marry and start a family and, for example, the rights to freely choose maternity and private and family life.

✓ *The right to the highest achievable health standard*. These standards are that women-friendly health services should: be available, accessible, acceptable and acceptable; comply with technical standards of care by providing a continuum of services in the context of integrated and strengthened systems; be implemented by motivated and supported staff of supervised, team-based training and performance evaluation related to incentives; and empowering users as individuals and as a group, respecting their rights to information, choice and participation.

✓ *The right to the benefits of scientific progress*. Scientific progress can play a vital role in reducing maternal mortality and morbidity rates. One of the most fundamental ways to reduce risk during pregnancy is to give women the ability to plan the number and timing of their pregnancies; this can be most easily achieved by using birth control technologies.

**c) *Rights to non-discrimination and due observance of differences* call on states to take action against discrimination in all areas of civil and political rights, as well as economic, social and cultural rights, including in the field of health. States are also obliged to eliminate laws, policies and practices that discriminate on specific and unspecified grounds ("other status"). It is therefore necessary to examine ways in which states ensure that they eliminate discrimination on the grounds of race, color, sex, national or social origin. These are not the only prohibited grounds for discrimination that are risk factors for unsafe motherhood.**

**d) *Rights related to information and education* cover:**

✓ *The right to receive and transmit information*. Rights to information itself and access to reproductive health services, in particular, are two of the most vital reproductive rights. In order to make informed choices about their reproductive lives, women must be able to receive information about family planning methods and services and have access to the methods and services they consider preferable.

✓ *The right to education*. There is a strong relationship between girls' access to education and literacy and the reduction of maternal mortality. Key factors in reducing maternal death in a number of countries have been the combined effects of education and empowerment strategies for girls and improved access to necessary health services [3].

The analysis of the data related to the children's rights reveals that a significant part of children globally is in situations that endanger the realization of fundamental rights, here we refer to the right to life and health. At the same time, a very large number of children globally do not have the opportunity to realize their economic, social and cultural rights fully or not at all.

The consequences of the Covid-19 pandemic have worsened the situation of children's rights. The number of children living in monetary poverty has increased, and the situation of children in families who do not have access to social protection instruments is even worse. At the same time, the specificity of this category of population is that children are dependent on adults, so the poverty in which they live should not be assessed only financially, but multidimensional: limited or no access to education, health care, housing, nutrition, sanitation or water. UNICEF research based on an analysis of the situation in more than 70 countries shows that about 45% of children were severely deprived of at least one of these critical needs before the global pandemic. The situation of children will worsen further if state governments do not take relevant measures to remedy the existing conditions of children.

The potential losses for today's young generation and for the development of human capital are difficult to estimate, but the pandemic has affected the right to education of more than 1.6 billion children and young people in 188 countries, which has closed schools. After the transfer to online education, more than 450 million children worldwide could not access distance learning, and the real number of pupils and students who do not have access to distance education is even higher.

Finally, even if children appear to be largely exempt from the direct impact on COVID-19 mortality, the indirect effects resulting from tense health systems and disruptions to life-saving health services, such as immunization and prenatal care, can lead to devastating increases in child deaths. The pandemic threatens to reverse decades of progress around the world in eliminating preventable child deaths.

#### **4. Conclusions**

Respect for the right to "maternal protection" guaranteed by the international treaties to which the Republic of Moldova has acceded, as well as by Article 50 of the Constitution, can be interpreted as satisfactory, as the levels of basic indicators recommended worldwide for monitoring maternity protection reveal positive trends.

However, the multidimensional approach to "maternal protection" in terms of human rights, such as life rights, survival and security of the person, maternity and health rights, non-discrimination rights and due respect for differences, as well as information rights and education reveals the need for in-depth analysis in order to perceive the real situation regarding ensuring a safe motherhood for women.

The analysis of the Global framework of indicators recommended for assessing the degree of respect for children's rights reveals that many indicators are developed and measured both globally and at the state level, which contributes to the implementation of policies to address critical situations.

Regarding the analytical aspect of respecting the rights of young people, we note that due to a lack of clarity on the concept of youth and the special regulation of this category of people, which partially falls on children and adults, it is not possible to analyze extensively this domain. Thus, we recommend to develop a comprehensive framework of indicators covering all strategic areas of youth sector development, so that the situation of young people's rights and their special protection can be monitored and remedied in time and space.

This research paper is developed within the project **"Human Rights in the Republic of Moldova: financial dimension and consolidation through the efficient public expenditures management"** (code 20.80009.0807.35).

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## **INSTAGRAM AS A MODERN VISUAL TOOL OF DIGITALIZATION**

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**Abstract.** *The article is devoted to the analysis of the famous social network Instagram. Its main functions and innovations are characterized. The influence of social networks on people, methods of attraction of audience, efficiency of functioning are considered. The idea of the company, its products and services to consumers is formed already at the stage of acquaintance with its site or page in social networks. The experience of using social networks as a tool for using and promoting Instagram profile in business is investigated.*

**Keywords:** *Instagram, social networks, information, brands, audience, users.*

**JEL classification: O35**

**UDC 659**

### **1. Introduction**

Relevance of the topic of this scientific work is due to the need to ensure, above all, the active use of digital technology. Digital media allow to reduce expenses for printing and logistics, to transmit to the consumer a beautiful powerful picture in collections and in the product. It is convenient, technologically and becomes the norm.

With the advent of the virtual world, our life has completely changed - the form of communication, information, entertainment and the like has changed. And it's no wonder that you can virtually walk around another continent or create a masterpiece of famous authors with the help of various applications or build a business without leaving home, receiving huge amounts of money and developing. Absolutely anyone who has a cell phone can quickly find information and instantly share it with millions of other people.

According to the latest report, digital trends spend an average of 6:00 42 minutes a day on the Internet. In other words, everyone spends more than 100 days a year in the global network. The most active modern people use social networks, which, by the way, have many options for business promotion. If before you had to spend a lot of money on television commercials and billboards, now it is enough to launch a much cheaper advertising company. This environment forms our daily experience, style of communication and habits. Consumers' perception of the speed and quality of services is based on our experience in the Internet.

### **2. Obtained results and discussion**

The idea of the company, its products and services to consumers is formed already at the stage of acquaintance with its site or page in social networks.

Instagram is dedicated exclusively to graphic content, but it is Instagram that has become an extraordinary success story. Instagram is a free program designed to place, process, share photos and videos on the Internet. 80% of content is visual - video and photos.

Instagram is one of the fastest growing social networks in the world. Every month it is used by more than 1 billion people. In many business areas, this platform has become a key channel of communication with users and a source of new customers, so it is important to learn how to use its tools and set the right tone for communication Instagram has long been a social network, so that each



of us can realize its potential, create a new inflow of customers, become more recognizable, as well as increase user loyalty to the brand. [2]

The number of Instagram subscribers grows in seconds.

**1. Instagram users.** According to the data of 2019, the number of users who actively use Instagram is 1 billion. Now imagine how huge is the audience and the number of active and passive candidates in it can be found. [3]. And also according to the research 86% of people are looking for work in social networks. In 2019, almost 855,000,000 users received monthly access to the Instagram platform for photo sharing. It is predicted that in 2023 this figure will exceed 988,000,000 users (Figure 1) [3].

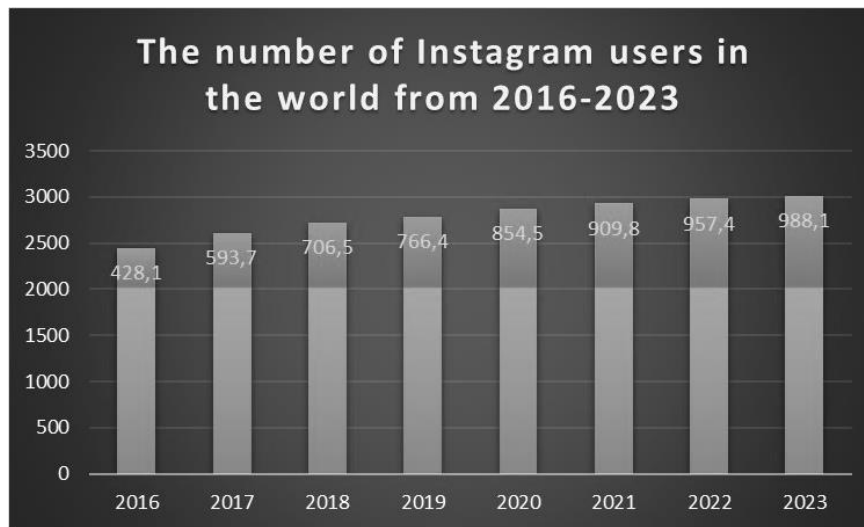


Figure 1

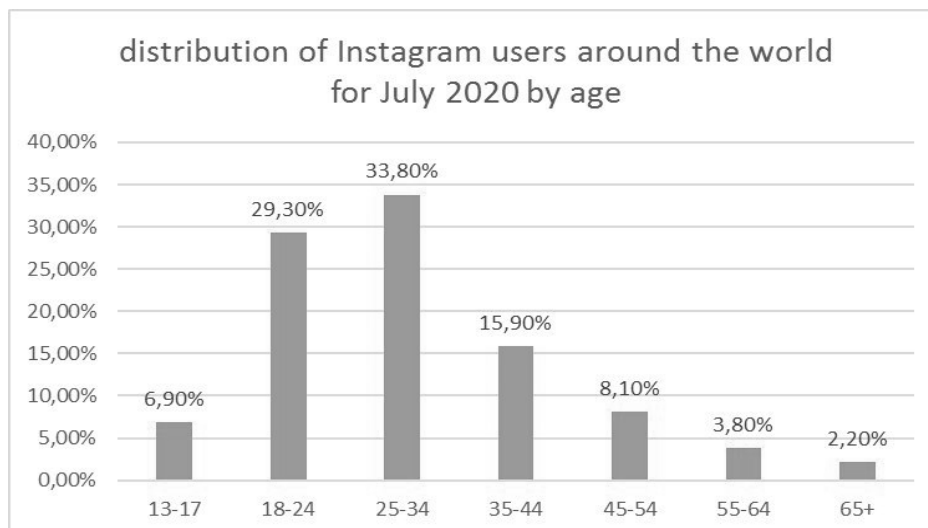


Figure 2

The application for sharing photos on social networks is especially popular in the USA, India and Brazil, where each of them has more than 130,000,000, 100 and 91 million Instagram users. According to forecasts, by 2022 the number of Instagram users in the U.S. will exceed 130,000,000 people.

Application for sharing photos on social networks is particularly popular in the U.S., India and Brazil, where each of them has more than 130,000,000, 100 and 91 million Instagram users. According to forecasts, by 2022 the number of Instagram users in the U.S. will exceed 130,000,000 people.

As of July 2020, 33.8 percent of Instagram's global audience is between 25 and 34 years of age (Figure 2). Overall, more than two-thirds of the total Instagram audience was composed of people aged 34 years and under, making the platform particularly attractive to marketers. Instagram is also one of the second most popular social networks among teenagers using the Internet and one of the most visited social networks among teenagers in the United States [3].

**2. Advertising audience and popular accounts.** Instagram has now outgrown its Facebook audience in 20 countries around the world, and we expect this number to increase in 2019 as the popularity of Instagram comes to the fore. However, it should be noted that recent data show that consumer brands have yet to work when it comes to attracting their audience in Instagram.

Only one consumer brand - Nike - is among the 20 most popular in Instagram, and the rest places are occupied by celebrities. Attentive readers will also notice that the Kardashian clan account accounts for four of these 20 best accounts, so Instagram will need to be careful not to cause another moment Snapchat-Kyli-Jenner.

Footballer Cristiano Ronaldo leads the list of the most popular accounts in Instagram. He is the most popular person on the photo sharing platform with more than 239 million subscribers. His own Instagram account came in first place with more than 369 million subscribers [1]

| Top Instagram account |               |           |
|-----------------------|---------------|-----------|
| Account               | Handle        | Followers |
| 1. Instagram          | @Instagram    | 276500000 |
| 2.Cristiano Ronaldo   | @Cristiano    | 151900000 |
| 3.Selena Gomez        | @Selenagomez  | 144500000 |
| 4.Ariana Grande       | @Arianagrande | 143000000 |
| 5.Dwayne Johnson      | @Therock      | 129000000 |

The brands strive to reach the audience of Instagram, as social network users demonstrate a high level of interaction from the content. Sports content such as NBA and NFL, as well as the sports sites Bleacher Report and Barstool Sports have a very interested audience. Not surprisingly, Ronaldo is back in first place, as the average cost of one of his Instagram posts is \$735,386. Instagram features.

Instagram is a social network for sharing photos, which allows users to take photos and edit them with filters. The platform allows users to publish and share their images online and directly with their friends and subscribers on a social network.

Strange as it may seem, Instagram is the cheapest traffic at the moment, because the cost of a subscriber in the given social network, compared to others, is much smaller.

At the same time, there is:

- Organic audience growth.
- High speed of information dissemination.
- Huge number of opinion leaders.

One of the most popular Instagram features is Stories. Users can publish photos and videos in their stream of stories, and content is available for others to view for 24 hours before it disappears. In January 2019, the company announced that it has 500,000,000 active users of Instagram Stories daily. Instagram Stories directly competes with Snapchat, another photo sharing application that originally became known for its "disappearing photos" feature.

**3. Hashtags - as main assistant account promotion.** A hashtag is a tag of a word with a grating. Such tags group the posts, thanks to the transition to the desired tag you can find a lot of

useful information. Once you enter and immediately dozens of publications will appear. Everyone determines for himself which category the written post will belong. In January 2011 Instagram introduced hashtags so that users could find both photos and each other. Instagram encourages users to make tags both specific and relevant, rather than tagging general words such as "photo" to highlight photos and attract like-minded Instagram users. Instagram users have created "trends" using hashtags. Trends that are considered the most popular on the platform often highlight a particular day of the week on which the material is published. Examples of popular trends include #SelfieSunday, when users post photos of their faces on Sundays; #MotivationMonday, when users post motivational photos on Mondays; #TransformationTuesday, when users post photos highlighting the difference between past and present; #WomanCrushWednesday, where users post pictures of women they are romantically interested in or positive about, and its equivalent #ManCrushMonday, dedicated to men; and #ThrowbackThursday, where users post pictures of their past, highlighting a particular moment.[2].

In December 2017, Instagram began allowing users to subscribe to hashtags that display relevant highlights of the topic in their feeds.

The maximum number of hashtags that can be placed under a photo in Instagram is 30 pieces. When writing extra hashtags, the system still won't miss them further for photo publication. It means that the user has as much as 30 opportunities to attract users to his content.

**4. How to effectively attract real users instead of fakes?** As a user, based on my experience, I noticed such observations on attracting subscribers. Under each prepared post, I necessarily put hashtags, but no more than 20, or better than about 10. At the end of the post it is important to separate them in a separate block. This way, readers will feel more comfortable and comfortable with the text. In the post also need to put a few hashtags, the main thing is not near, in different places of the text. The rest of the hashtags, you need to put in the first comment under the post. It looks good and users will go to look at the comment. Do not choose too general phrases. By the word #flowers you can find not only home delivery of compositions, but also just pictures of bouquets, dresses, furniture, pictures with flowers. Put yourself in the shoes of your audience - how does it look for the right information? Also, it is very important to observe who uses hashtags, so that you know whether to use them at home or not. The main thing is that not often there are many hashtags, only on the case that touches your profile content, because they may think that you are a spammer and impose restrictions.

**5. IGTV.** One of the more interesting feature additions is Instagram TV. IGTV, launched as the first standalone video platform for Instagram, is a brand-new channel for businesses to generate more followers and engagement. First, you need to create an IGTV channel. It's very simple. You create an account on your Instagram account. The IGTV video will now be in your Instagram profile grid with the IGTV icon in the right corner. While IGTV's options are limited, from a marketing perspective, it's great for promoting products, teaching products, and sharing news - think about the type of video you'll see on YouTube.

This feature enhances your Instagram Stories, but it doesn't have to be as perfect or carefully curated as an Instagram post or video. Instagram offers analytics for your IGTV video and measures views, likes and comments, as well as your audience's retention rate, which shows how many people have watched your video to the end. These metrics are critical when designing your IGTV usage strategy to make it the most effective in terms of marketing. If your viewers leave after 10 minutes, you may realize that videos longer than 10 minutes are not interesting to your audience [5].

There are 6 factors that affect the order of content delivery in the ribbon:

- 1.1 user interest in content
- 1.2 The relationship between the user and the content creator
- 1.3. Relevance
- 1.4. Frequency of opening user program
- 1.5. The number of user subscriptions.
1. 6. User activity on the platform.

**6. Changes in algorithm and design.** In April 2016 Instagram began to make changes in the order of photos displayed on the user's timeline, moving from strictly chronological to the order determined by the algorithm. Instagram said the algorithm was designed so that users could see more

photos of users they liked, but received significant negative feedback, and many users asked their subscribers to include publication notifications to make sure they saw the updates. The company wrote for users who were upset about the prospect of the change, but did not back down, and did not suggest a way to change it back.

Since 2017, Instagram has used the ability to reduce account visibility ("shadow ban"), which it believes can lead to fake interaction and spam (including excessive use of unnecessary hashtags), preventing messages from appearing in search results and applications. Explore the section. In an already remote post on Facebook, Instagram wrote: "When developing content, we recommend that you focus on the goals or objectives of your business, not on hashtags". Instagram has since been accused of extending this practice to the censorship of posts under vague and inconsistent circumstances, especially with regard to sexual content.

**7. The best Instagram updates you should know about in 2020.** The latest Instagram messaging system updates for October 2020 and much more. The new business application released on Instagram and Facebook is now available on Instagram and Facebook. Facebook renamed its Pages Manager application to Facebook renamed its Pages Manager application to Facebook Business Suite, an application that allows companies to manage Facebook and Instagram accounts. This cross-platform internal integration allows the administrator to publish messages on the networks and track messages, notifications and analytics in one place. That the application is primarily designed for small businesses, but in the end it will be extended to all companies through social networks.

**8. Added automatic subtitles for IGTV.** As part of a major effort to make Facebook and Instagram more accessible, Instagram IGTV creators can now include automatic subtitles for their videos. The subtitles, which are based on AI automatic speech recognition, will first be available in 16 languages.

Subtitles can be included in the video settings menu. Automatic subtitles do not provide 100% accuracy, but the artificial intelligence behind them learns and improves as more and more people use them.

**9. More tools for trading in development.** In honor of the 10th anniversary of Instagram Company, the company has released a number of materials and promised to continue supporting small businesses and authors. The new map and calendar allows viewing old stories by date and location. People can also change the Instagram icon on their phone to classic, retro or other style, gaining access to secret options in settings. To update the icon, go to your profile and open the menu. Open the settings and pull the page down until you see the confetti animation. Updating clips increases the duration of the clip to 30 seconds.

The last update of Instagram for coils, TikTok-style video clips, released in August, increases the duration of video from 15 to 30 seconds. The update also added the ability for creators to extend the timer to 10 seconds when recording, and added trimming and editing tools [4].

**10. Gift cards and orders.** In response to COVID-19, Instagram introduced 2 new features for small businesses: gift cards and food orders. Gift Cards is a new way for businesses to sell redeemable vouchers in the application, available through the profile button or the new Instagram Stories sticker.

While Food Orders provide a new way for hospitality businesses to raise awareness of their food delivery services.

The new profile button and Instagram Stories sticker can be used to place orders via Caviar, Chow Now, delivery.com, UberEats, GrubHub, Seamless, Postmates, Doordash, etc.

Thus, users are now actively mastering the virtual space of the Instagram social network. Therefore, further research is needed to track trends in the language of interpersonal communication and features of self-representation, which are constantly changing and carry a huge potential for learning. The main feature of communication in Instagram network is the use of visual content. On the one hand, it facilitates the task of promoting any brand, because the language strategy is not so important here and may be quite different. But on the other hand, everything complicates the need to create a picture that will attract the target audience, will carry the idea of the brand, to promote the acquisition of this product. Many brands are not able to offer their own promotion strategy in the Instagram network, put a lot of monotonous content, do not lead to a positive effect [5-7].

Thus, from all the cherished words we can conclude that Instagram is one of the main tools for shaping public opinion in today's world and that this platform, where the main rule is speed. The post should turn out so that it is immediately understood. As a billboard on the road minimum words - maximum information. It is important that the post is beautiful and impressive, so that the person sees, remembers, loves and keeps himself. Perhaps, it is time to look at the Instagram capabilities through the eyes of experts. The advantage of social networks is not in one of the billions of applications, but in a social network, which, like others, can become a powerful marketing channel for brands.

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## CONTRIBUTIONS REGARDING THE IMPROVEMENT OF INSTALLATIONS FOR THE MACHINING OF CONDUCTIVE MATERIALS THROUGH IMPULSE ELECTRIC DISCHARGES IN SUBEXCITATION REGIME

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**Abstract.** *The method of machining by impulse electric discharges in subexcitation regime (IEDSR) presents a machining method that allows obtaining some superficial layers whose properties differ from the properties of the basic material of the piece. This machining method has a lot of advantages compared to other machining methods such as, formation of the intermediate layer between the deposited layer and the base material, the lack of formation of micro cracks on the processed surface, possibility of using a wide variety of materials and so on. At the same time, the low productivity of the process, obtaining a surface with a high roughness, obtaining a non-homogeneous surface, make inefficient the using the given process. The paper below presents a description of the solution for layer deposition by IEDSR. The endowment of installation with a multi-electrode system that is powered by the generator of impulses and the use of two stepper motors that can execute up to 1800 micro-steps, controlled by a programmable microcontroller, successfully eliminates the disadvantages of the IEDSR machining process.*

**Keywords:** *Impulse electric discharge, subexcitation regime, multi-electrode system, microcontroller, stepper motors.*

**UDC: 620**

### 1. Introduction

The paper refers to the installation for the deposition of superficial layers by impulse electric discharges in subexcitation regime (IEDSR) which consists of two subassemblies:

*The mechanical component* of the installation is similar to a miniature of a lathe of splinter of a metals, at which can be installed a cutting tool or **multi-electrode system** with  $n$  electrodes can be installed, which are powered from the pulse generator. The mechanical component operates on the basis of two stepper motors that can execute 1800 micro-steps per rotation and a motor with collector ( $10\,000\text{ min}^{-1}$ ) for finishing the surface before machining with IEDSR. The installation is managed by a programmable controller that controls the realization of electric discharge, rotation of the piece and the longitudinal movement of the electrodes.

*The impulse generator* represents a prototype of the "Razread-M" installation, provided for the mechanical installation with the "multi-electrode" system (4 electrodes).

*General objectives:* conception, design and realization of the mechanical component of the programmable installation with a multi-electrode system for the deposition of superficial layers with the application of IEDSR.

#### **Specific objectives:**

- Increasing productivity in the process of depositing the material on the cathode (processed piece).
- Obtaining a relatively homogeneous layer on the surface of the piece.
- Application of electric discharges (craters with expelled material) with a preset resolution.

#### **Advantages of the installation:**

- Increased productivity of layer deposition compared to installations with one electrode;
- Obtaining a layer of deposits (metal, semiconductor, dielectric) through IEDSR in the form of a matrix;
- Obtaining a wide spectrum of thicknesses of the deposited layer;

- Possibility of finishing machining until machining with IEDSR;
- Accessibility of microcontroller programming (C ++).

## **2. Installations of machining with impulse electrical discharge**

There is a wide variety of installations for the purpose of superficial machining of materials with the application of impulse electric discharges. There are known a series of installations produced by the Experimental Factory of the Institute of Applied Physics of the Academy of Sciences of the Republic of Moldova type "Elitron" - installations in which the tool - electrode is installed on a lever intended for manual processing, operating in "contact breaking" regime, performed by a vibrator installed on the respective lever. The installation has a low productivity, and the quality of the deposited layer, likewise, is low, which also depends on the skills of the operator. Figure 1, a.



a)



b)

Figure 1.

- Installation of machining with impulse electrical discharge with "contact breaking";
- Installation of machining with impulse electrical discharge by applying impulse electric discharges in subexcitation regime.

For the superficial machining of materials with the application of impulse electric discharges in subexcitation regime with or without the application of metal powders in the interstitium (between the electrodes), are known the "Razread" type installations which represent a metal lathe of splintering whose splintering tool is replaced by a powered electrode by a pulse generator that is managed by a command block that synchronizes high voltage electrical discharges and low voltage electrical discharges. This type of installations works in a small number of work regimes. The electric discharges take place ally while the piece is rotated continuously, which leads to an uneven layer of deposits. The piece meets only the resistance of the environment (air) but is rotated with a relatively high power motor that leads to unjustified energy consumption. The capacitor batteries in which the

discharge energy is stored serve only for some working energy regimes. The productivity of the mentioned installations is low, likewise the surface quality. All these disadvantages speak of the need to develop installations with the use of new, advanced technologies, and their operation to be controlled by a computer system.

### 3. Proposed solutions in the improvement of the machining installations by impulse electric discharges

In order to achieve the objectives proposed in the paper, the installation for the processing of conductive materials by impulse electric discharges in subexcitation regime with  $n$  electrodes are presented, which eliminates the disadvantages mentioned above.

The advantages obtained from the use of this installation consist in the execution of electric discharges with a high resolution ensured by the rotation of the piece and the longitudinal movement of a multi-electrode system by means of stepper motors, capable of executing 1800 micro-steps per rotation, obtaining a structured surface with a lower roughness comparing to the results obtained at the installations described above.

The operating process of the proposed installation is controlled by a programmable microcontroller, so that it is possible to obtain deposits with a predetermined resolution or to obtain several layers of deposits. Endowing the installation with a multi-electrode system with  $n$  electrodes allows to obtain a relatively high productivity of the installation. The energy consumption of the motors used at the proposed installation is ten times lower than the energy consumption of the motors of the installations described above. The installation is presented in Figure 2.

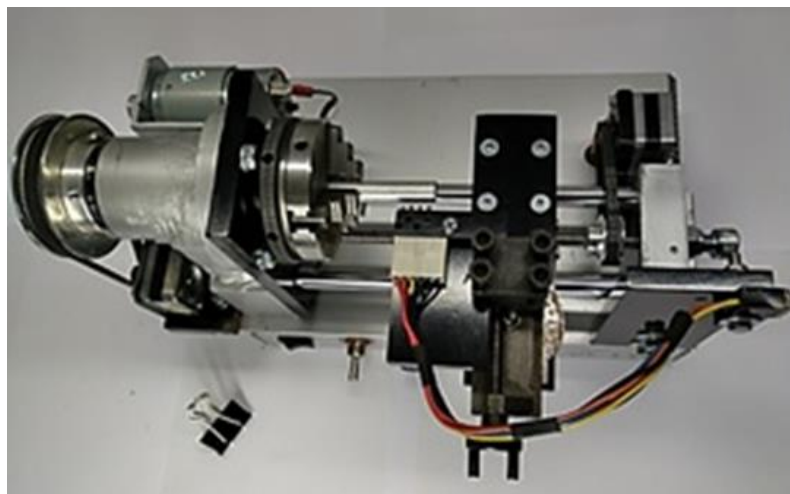


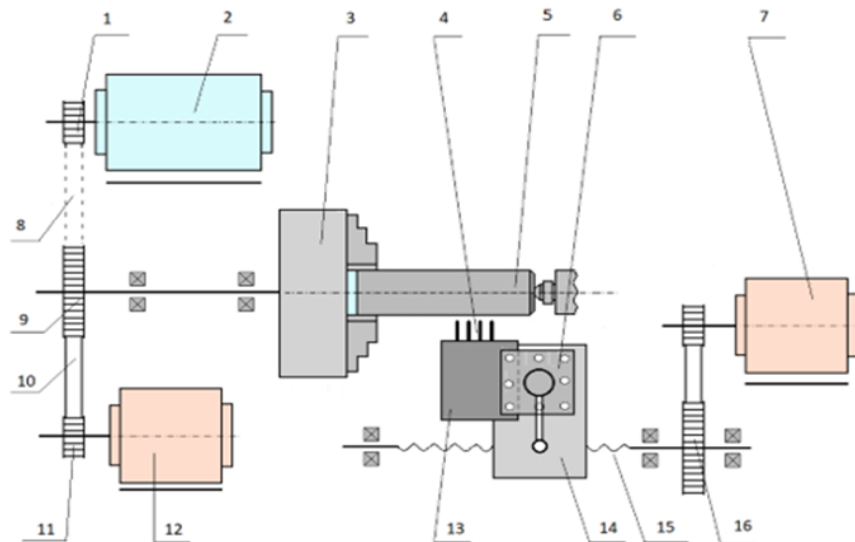
Figure 2. Overview of the mechanical component of the machining installation with impulse electric discharges, in subexcitation regime with more electrodes.

The mechanical component is a miniature of a metal lathe of splinter, endowed with a continuous speed motor (2) and two stepper motors (7, 12), (Figure. 3).

The motor (3) is connected by changing the synchronous transmission belt (10) to position (8), for surface finishing work. The stepper motors (7, 12) are intended to rotate the piece (5), fixed in the mandrel (3), with a very low angular speed and the longitudinal movement of the trolley (14), with micrometric steps. On the tool holder (6), can be mounted a splinter tool for finishing the surface undergone to machining or a multi-electrode system (13) with  $n$  positively polarized electrodes for machining the surface by IEDSR. The use of the microcontroller allows the programming of the machining process in such a way as to execute electric discharges on the machined surface with a high resolution, obtaining a uniform surface and respectively a higher quality of the deposited layer, compared to existing installations. Due to the rotation of the piece and the longitudinal movement of the multi-electrode system with micro - steps, the number of electric discharges per unit area can be



programmed in a very large range, obtaining different resolutions of IEDSR and layers of different thicknesses, respectively.



- |                                   |   |
|-----------------------------------|---|
| 1. Belt drive wheel 1;            | 9. Drive belt wheel;                          |
| 2. Continuous speed motor;        | 10. Synchronous transmission belt;            |
| 3. Universal chuck;               | 11. Belt drive wheel 2;                       |
| 4. Electrodes (anode);            | 12. Bipolar stepper motor 2;                  |
| 5. Workpiece (cathode);           | 13. Multielectrode system;                    |
| 6. Tool holder support;           | 14. The trolley;                              |
| 7. Bipolar stepper motor 1;       | 15. The leading screw of the trolley;         |
| 8. Synchronous transmission belt; | 16. Longitudinal transmission of the trolley. |

Figure 3. The main mechanical scheme of the machining installation with impulse electric discharges in subexcitation regime with several electrode electrodes

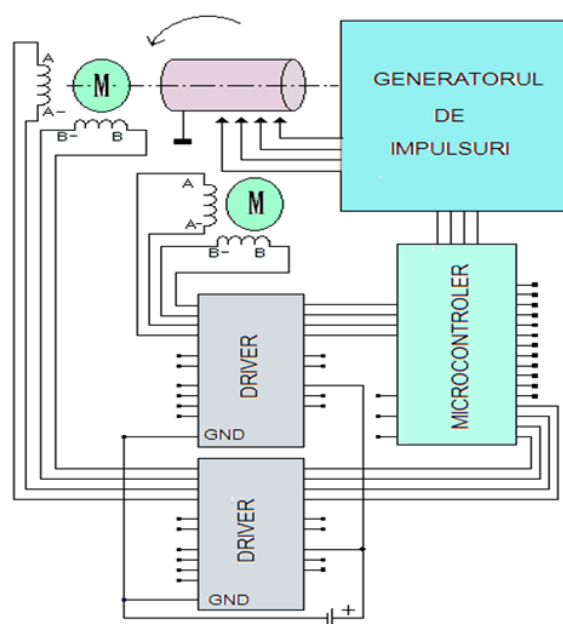


Figure 4. The main electrical scheme of the installation.



ports with which the ATMEGA 328P is endowed - especially serial communication, via the UART port. Besides, the microcontroller can also communicate with the external environment through I2C or SPI protocols.

Last but not least, was opted for this microcontroller also due to the fact that it supports a large supply voltage range of 1.8-5V which ensures good stability in conditions of disturbances in the industrial environment.

In the shown scheme, in order to command the triggering of the download, the generic port O1 was used, which is raised to the state of "1" logically for the duration for which the download is desired. The pulse duration was set in the laboratory simulations to obtain an optimal discharge, in the range of 10-50ms. Besides, the resolution allowed by the microcontroller and the programming environment is at the millisecond level, which allows great flexibility in use.

The impulse thus obtained is transmitted via limiting resistance of the current R1 to the anode of the optocoupler LED OPTO1. It was decided to introduce into the circuit the optical coupling considering the very high voltages that will be generated in the secondary transformers but also for the fact that the voltage required for the primary transformer coil Tr1 (V2) is higher compared to the microcontroller supply (5V) and for his protection.

The bright excitation of the LED in the optocoupler causes its transistor to be open for a period of time equal to that of the firm command, in the rest of the time it is not in conduction. This allows that in the absence of conduction, the voltage at the 4th pin of the optical coupling is 0V and at the moment of conduction is close to the value of V2. This is also signaled by the lighting of the D2 LED during the conduction of optocoupler used as witness.

The command voltage then reaches the MOSFET transistor gate through the resistive divider (for experiments, we chose IRF540). This transistor supports a power dissipation of approximately 50W. Also, this transistor was chosen for the drain-source resistance of only 0.077 ohms in case of maximum opening ( $U_{gate-source} = 10V$ ), the maximum voltage supported between the drain and the source being 100V and the maximum current supported by the drain-source when driving maximums being over 20A. Such a transistor was necessary because the primary of the lifting transformer Tr 1 has a relatively low resistance. Also, in parallel with the primary transformer, a diode was mounted (in reverse direction to the current direction) to suppress the reverse voltages that occur by induction in the primary transformer when the supply voltage disappears. Also, in the source of the MOSFET type transistor, a low power value resistance was applied toward the table (in the tests a value of 0.22 ohms at 5W was used) necessary to protect the coil of the primary of the transformer that lift voltage in case the duration of the command pulse would be longer.

For V2, during the experiments, a value of 12V was used but, for the modification of the discharge parameters, by changing the secondary voltage, it can be modified, in the upper direction up to a value of 24V, the command transistor can support this without problems.

The voltage collected from the secondary of transformer Tr1 is readdressed by means of diode D4 (high voltage or several series diodes) and applied to the pair of electrodes. In the discharge electrodes also are arriving, through diode D5, the voltage obtained by accumulating electrical charges on capacitor C1. This voltage is also accompanied by a very high current, given by the almost instantaneous discharge of the capacitor C1 and necessary to obtain high temperature values for fixing the powders on the desired surface. The voltage on capacitor C1 has a much smaller order of magnitude than that obtained through the transformer Tr1, depending on the nature of the materials used, which can vary in the range of 50-350V. The set of diodes D4 and D5 prevent the high voltage obtained through the transformer Tr1 from not reaching the capacitor C1, thus protecting it from puncture.

The voltage required to charge the capacitor C1 is obtained from the electric network with the help of the transformer Tr2 and readdressed with the help of the rectifier bridge BR1. As an idea for a further development of the project, it will be opted for a controlled charging of the capacitor C1 through the microcontroller in order to be able to control the energy required to discharge the capacitor depending on the materials used.

In the scheme in figure 5, only the circuits necessary for a single pair of electrodes were represented. This can be repeated / multiplied for as many pairs of electrodes as necessary and a

possible temporary gap between the electrodes can be ensured by using different ports of the microcontroller.

### **5. Conclusions**

The development of technologies in general and information technologies in particular make it possible to adapt the machining process using IEDSR to an information system capable of rotating the work piece and moving tools with the multi-electrode system so as to produce the necessary electric discharges at the right place and the right time.

The use of stepper motors that have sufficient characteristics to perform the necessary tasks and their programmed operation, allow to obtain high resolutions of the deposited layer or to obtain several layers of deposits.

In this way we can optimize the IEDSR machining process by achieving the following objectives:

- streamlining the processing process by increasing the productivity of the process;
- obtaining surfaces with a low roughness after processing;
- obtaining electric discharges with a predetermined resolution;
- obtaining layers of predetermined thicknesses;
- considerable savings in electricity.

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## THE OCCURRENCE OF THE ROPE SPOILAGE OF BREAD AT CAHULPAN BREAD-MAKING COMPANY

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**Abstract:** Rope spoilage is one of the most frequent diseases of bread, which is caused by the activity of bacteria of the genus *Bacillus*. The aim of this paper was to observe, determine and discuss the evolution of the occurrence of rope spoilage in bread at Cahulpan company during the warm months of 2011–2020 period. Seven types of bread have been chosen for the study. The most cases of the rope spoilage were detected in the long loaf breads during 2011–2016 period. The occurrence of the rope spoilage in these breads was primarily caused by the use of flour with a high degree of contamination with mesophilic aerobic spore-forming bacteria of the genus *Bacillus*, then by the titratable acidity under 2.0 degrees of acidity and/or the slow cooling of bread after baking. Due to several internal measures applied by the company (i.e., improvements of hygienic system and bread cooling after baking, rigorous check of suppliers, careful microbiological analysis of ingredients and use since 2017 of calcium propionat as a preservative against rope spoilage) based on previous research, the incidence of the disease decreased and disappeared after 2017.

**Keywords:** *Bacillus subtilis*, bread acidity, bread, rope spoilage, Ca propionate, cooling process, spore-forming bacteria, wheat flour.

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### 1. Introduction

#### 1.1. The rope spoilage of bread

The rope spoilage of bread is an undesirable disease consisting in the bacterial decomposition of the bread crumb. Such bread becomes unhealthy and improper for consumption [1; 15].

The disease is produced by bacteria of the genus *Bacillus*, primarily *B. subtilis* subsp. *mesentericus* and sometimes *B. licheniformis*, *B. cereus*, and *B. pumilus* [1, p. 356; 5, p. 402; 8; 12; 13; 14; 15, p. 441; 28]. Valerio et al. (2012) isolated, besides *B. subtilis*, another important species of the genus *Bacillus*, namely *B. amyloliquefaciens* [27] and a few species of the genera *Paenibacillus* [24]. Other species that are able to initiate the rope spoilage are *B. mycoides*, *B. polymyxa*, *B. firmus*, *B. clausii*, *B. megaterium*, etc., but with a less important role than *B. subtilis* [9; 12; 24].

The flour represents the main source of rope spoilage producing bacteria [12]. These bacteria are found in soil, in concentration of up to  $10^5$  C.F.U./g soil, and the main path through which they reach the grain mass is represented by the dust particles that attach to the grains during wheat harvesting and processing. Additionally, when stored under improper conditions, wheat undergoes self-heating, and the number of bacteria increases considerably and can exceed  $3 \cdot 10^4$  C.F.U./g [9].

Subsequently, these bacteria pass from the wheat into the flour during milling [7]. An insufficient cleaning of the wheat before milling contributes to obtaining a flour with a high level of contamination with microorganisms. The level of flour contamination also depends on the degree of flour extraction. Thus, the higher the extraction degree and the higher the yield in flour are, the higher the content of particles from the peripheral layers of the grains in flour will be. This means that this flour

<sup>1</sup> C.F.U. – colony forming units

will contain a higher concentration of microorganisms because the peripheral layers of the grains contain a larger number of microorganisms [7; 11]. As a consequence, brown breads obtained from flour with a high bran content, appear to be more susceptible to rope spoilage [7; 22]. The spores of *Bacillus* spp. may also be present in other raw materials such as baker's yeast and improvers [22], as well as in the bakery environment, e.g. the surfaces of processing equipment and the atmosphere [22; 24].

Bacteria producing the rope spoilage form thermoresistant endospores able to maintain their viability in the baking process. While during the baking of the dough the highest value of the temperature inside the bread is 98°C for several minutes, the spores are not destroyed. After baking and cooling the bread, surviving spores can reach the vegetative form, in certain conditions, and multiply, causing the spoilage of the bread [5, p. 402; 15, p. 441]. Optimum growth conditions for rope formers are 35...45°C, humid environment (e.g., packed bread), and values of pH above 5.3 (bread with low acidity).

The rope spoilage occurs more frequently in bread during the warm period of the year. The first signs appear after 24–48 hours of bread storage as a modification of the bread odour. Thus, initially, ropiness occurs as an unpleasant fruity odour, often described as similar to a strong scent of overripened pineapples [22] or melon, honey or valerian [5, p. 402]. It is then followed by patchy discolouration of the crumb in the central portions of the bread [22] as a result of enzymatic degradation of the crumb [12].

If the rope spoilage progresses, the smell intensifies and becomes rotten, and outbreaks of bacteria that appear as yellow-brown or pink-brown spots can be observed in the crumb [5, p. 402; 15, p. 441]. Also, the porous structure of the crumb deteriorates, gaps appear, and the crumb becomes soft and sticky because of the production of glutinous extracellular polysaccharides as a result of enzymatic activity [22]. These compounds contribute to the formation of thin strands or "ropes" when the bread loaf is broken or cut into slices and the pieces are taken apart giving, at the same time, the name of the disease as "rope spoilage" [5, p. 403; 15, p. 441; 22]. At the strong development of the spoilage, the crumb turns into a compact and dark mass, with a specific pungent and unpleasant smell, from which the name „potato disease" comes [5, p. 403; 15, p. 441; 29].

The basic factors leading to the occurrence of ropiness are [5, p. 403; 14; 29]:

- a) The degree of flour contamination with spore-forming bacteria of the genus *Bacillus*: the higher the number of spore-forming bacteria or C.F.U./g of flour, the more frequent the cases of the occurrence of the disease are [5, p. 403].
- b) The preparation and fermentation regime of the dough: the values of the pH of the dough has to be less than 5 to prevent the growth of bacteria.
- c) The conditions under which the bread is cooled and stored after baking. The rope spoilage occurs more often in summer when the cooling of bread after baking is slow, and it has temperature higher than 25°C for longer periods after removing it from the oven. The rapid cooling of the bread after baking at 18...20°C eliminates the occurrence of the disease.

## 2. Approaches to ropiness control and the aim of the paper

The bread with rope spoilage can cause illnesses to consumers if eaten by mistake, on the one hand, and it causes economic losses, on the other hand. Therefore, the implementation and enforcement of good manufacturing practices and food safety systems to reduce the proliferation of rope-causing bacteria and prevent the occurrence of ropiness are necessary. Some guidelines which may help in reducing the incidence of rope spoilage are the followings [3, p. 282, 357–359; 5, p. 403–404]:

- Effective inhibitors of microbial growth to lower the pH of the crumb to 5.4 or less [3, p. 90–92];
- Natural acidification of dough and bread through long fermentation times, sourdough use [3, p. 52; Mortazavi & Sadeghi, 2011; Sadeghi, 2008; Torrieri et al., 2014; ] and whey addition that lower the pH of the dough below 4.6;
- Effective chemical acidulants as preservatives such as propionic acid, calcium propionate at levels of 0.1–0.5 % [3, p. 73–74];
- Proper heating, ventilation, and air conditioning (HVAC) systems to reduce the risk of air-borne contamination from outside the bakery [2; 3, p. 156–159];

- Proper sanitation practices such as hygienic design, cleaning, supplier check, microbiological analysis of ingredients [3, p. 357–359]
- Treatment of grain by infrared or other strategies that can reduce microbial load [2];
- Prevention of cross contamination by avoiding the contact between freshly baked bread with ingredients and/or stale bread [2; 3, p. 118, 359];
- Starter cultures of propionic acid bacteria that are antagonistic to spore-forming bacteria of the genus *Bacillus* producing propionic acid and some substances with antibiotic effect [5, p. 404];
- Starter cultures of lactic acid bacteria [4; 12; 21; 25; 26].

Several previous kinds of research have been aimed to address the control of rope spoilage of bread at the bread-making company Cahulpan located in Cahul, Republic of Moldova [16; 17; 18].

The first study was focused on the influence of sourdough addition on the characteristics of wheat bread and on the occurrence of rope spoilage after baking and storage [16]. The results confirmed the positive role of sourdough in preventing the ropiness occurrence, only the control bread being affected by the disease after 72 hours from baking. Also, the results were consistent with the literature, e.g., Valerio et al. (2012) showed that raw materials used for bread production are a rich source of spore-forming bacteria and sustained the need of monitoring the microbiological quality of raw materials, primarily the flour and yeast [24].

Further, the authors investigated the process of bread cooling after baking and determined the correlation between cooling and the occurrence of the rope spoilage in bread and bakery products [17]. The results showed that classical cooling was satisfactory only for the bread made from wheat flour that was not contaminated with spore-forming bacteria of *Bacillus* spp. The ropiness occurred after 48 hours in bread samples cooled in the bakery section and after 72 hours in the warehouse of delivery. The results highlighted the fact that the classical cooling at lower temperatures ( $17.5 \pm 0.5^{\circ}\text{C}$ ) delayed the occurrence of the rope spoilage of bread as a result of a faster cooling of the crumb. However, because the shelf life of bread is 24–48 hours, the rope spoilage does not occur if bread is consumed to meet this term [17].

Another study [18] was focused on the use of calcium propionate to prevent the occurrence of rope spoilage in bread and the influence of the addition on the quality of bread. The levels of addition were between 0.1 and 0.4 % lower than the maximum 0.5 % indicated by Cauvain (2015) [3, p. 73–74]. The results showed that the first signs of ropiness were observed after 24 hours in the control bread (without addition of Ca propionate) while in bread with addition of Ca propionate only the sample with 0.1 % was affected after 72 hours. Therefore, an addition of 0.2 % Ca propionate could be sufficient to eliminate the hazard of ropiness occurrence in bread. At the same time, the properties of bread were determined. The results showed a decrease of the physical indicators of bread quality (total volume, height, porosity), while the acidity did not have a significant variation.

Given the results obtained in the successive researches presented above, Cahulpan applied several internal measures able to improve the cooling conditions of bread, and the hygienic system, to verify more rigorously the suppliers and to carefully perform microbiological analysis of the ingredients. Also, Cahulpan company decided to use the Ca propionate as a preservative against the rope spoilage. The use of Ca propionate started in 2017.

Therefore, the aim of this paper is to observe, determine and discuss the evolution of the occurrence of rope spoilage in bread at Cahulpan company during several years before the new measures were introduced and continued until the end of the year 2020 (period 2011–2020).

### 3. Materials and methods

#### 3.1. Bread

Seven types of bread manufactured at Cahulpan bread-making company (Cahul, Republic of Moldova) have been chosen for the study: long loafs "Spicisor" (500 g), "Cahuleanca" (450 g), and "De Capitala" (350 g), bread in forms "Deosebita" (550 g), round shape "Wheat bread, quality I" (500 g), and "Wheat bread, quality II" (500 g), and elongated shape bread baked on the stove „Bread with milk and bran" (300 g).

### **3.2. Other materials and equipment**

Digital thermometer, room thermometer, thermostat, balance, equipment to determine the loaf volume, special rulers, racks, Petri dishes, culture medium were used.

The Special Registers for registration of data related to the occurrence of the rope spoilage in bread obtained at „Cahulpan”, Cahul, Republic of Moldova for the periods 2011-2014 and 2015–present were also used.

### **3.3. Rope spoilage test**

The rope spoilage test applied to bakery products manufactured at the Cahulpan was performed according to the requirements of the Instruction for the prevention of rope spoilage in bakery products [14]. Thus, the evaluation of the occurrence of rope spoilage was performed daily during the warm months of the year (May-September), each sample being analyzed after 24, 48 and 72 hours of thermostatisation at 37°C. The product was considered to be affected by rope spoilage if it had an unpleasant odor and a sticky core. The data obtained in rope spoilage tests were filled in a special Register for the evidence of the occurrence of rope spoilage in bakery products manufactured at Cahulpan company.

### **3.4. Number of spore-forming bacteria in flour**

The standard method for determining the number of mesophilic aerobic spore-forming bacteria by culturing on Plate Count Agar medium (PCA – peptone from casein 5 %, yeast extract 2,5 %, glucose 1 %, agar-agar 14 %) was used to determine the degree of flour contamination. The inoculation was carried out after pasteurization of samples (aqueous flour suspensions) for the destruction of non-sporulated bacteria. For the microbiological analysis, 6 batches of flour of 2<sup>nd</sup> quality, received at the Cahulpan company in different periods of time during September-October 2013 were used.

### **3.5. Acidity of bread**

The acidity of bread was determined with the aqueous extract method [20] which consists in determining the volume of sodium hydroxide (NaOH) solution 0.1 *n* necessary to neutralize the acids present in bread. The titration is carried out in the presence of phenolphthalein indicator until the appearance of pale pink and stable colour.

### **3.6. Calculation**

Each experiment was carried out in duplicate and the results were provided as average  $\pm$  SD (standard deviation). Excel programme of Microsoft Office 2010 software was used for calculations, plots and to analyse the data by one-way analysis of variance (ANOVA) then tested by least significant difference (LSD) for mean comparison when level  $p \leq 0.05$ .

## **4. Results and discussion**

### **4.1. Detection of ropy bread, 2011-2020**

The occurrence of the rope spoilage in the bakery products selected for the study was observed in the period 2011-2020, from May until September, the warm months of the year. The analysis was based on the data recorded in the Special Register for the evidence of the occurrence of rope spoilage in bakery products manufactured at Cahulpan company [30; 31] and on several tests performed by the authors in co-operation with the Cahulpan employees in charge with the quality control of bread and bakery products.

Each type of bread was subjected to the rope spoilage test and observed for 72 hours, positive data being recorded in the Special Register [30; 31].

The results were then summarized and processed in Excel programme of Microsoft Office 2010. The results are presented in the form of a plot (Figure 1) as the occurrence of the rope spoilage in bread, in number of cases per year against the year. Where certain number of cases on ropy bread



per year were obtained a vertical bar is presented on the plot. Bars have different colours for each type of bread according to the legend of the plot.

The rope spoilage frequency varied in time and depended on the type of bread (Figure 1), the highest values being recorded in 2011 for both long loaf "Spicușor" and "Cahuleanca". High values were also recorded in 2013, 2014 and 2015, primarily for the long loaf "Spicușor" followed by the long loaf "De Capitală" and long loaf "Cahuleanca". The number of ropey bread cases per year decreased in 2016 due to the application of several internal measures intended to decrease the occurrence of the rope bread spoilage such as the improvement of the cooling conditions of bread and the hygienic system, the verification of the suppliers a.s.o. In 2017 and the years that followed, after the management of Cahulpan bread-making company decided to use the Ca propionate, as a result of previous results published in the same year [18], there was no more rope spoilage detected in any type of bread or baking product.

The occurrence of rope spoilage in the products presented in Figure 1 is explained primarily by the use of flour with high degree of contamination with mesophilic aerobic spore-forming bacteria. Whereas the determination of the degree of contamination of flour requires a long time (2-3 days), it makes impossible to detect the flour with a high degree of contamination at the moment of reception of flour at the company. Therefore, batches of flour are accepted without their initial microbiological control. That is why some of batches of flour can have a high degree of contamination with mesophilic aerobic spore-forming bacteria, which can lead to the occurrence of rope spoilage in bakery products. However, if such batches of flour are identified, the flour is mixed with flour free of contaminants or with flour with a low degree of contamination to „dilute” the spore-forming bacteria and reduce the risk of rope spoilage.

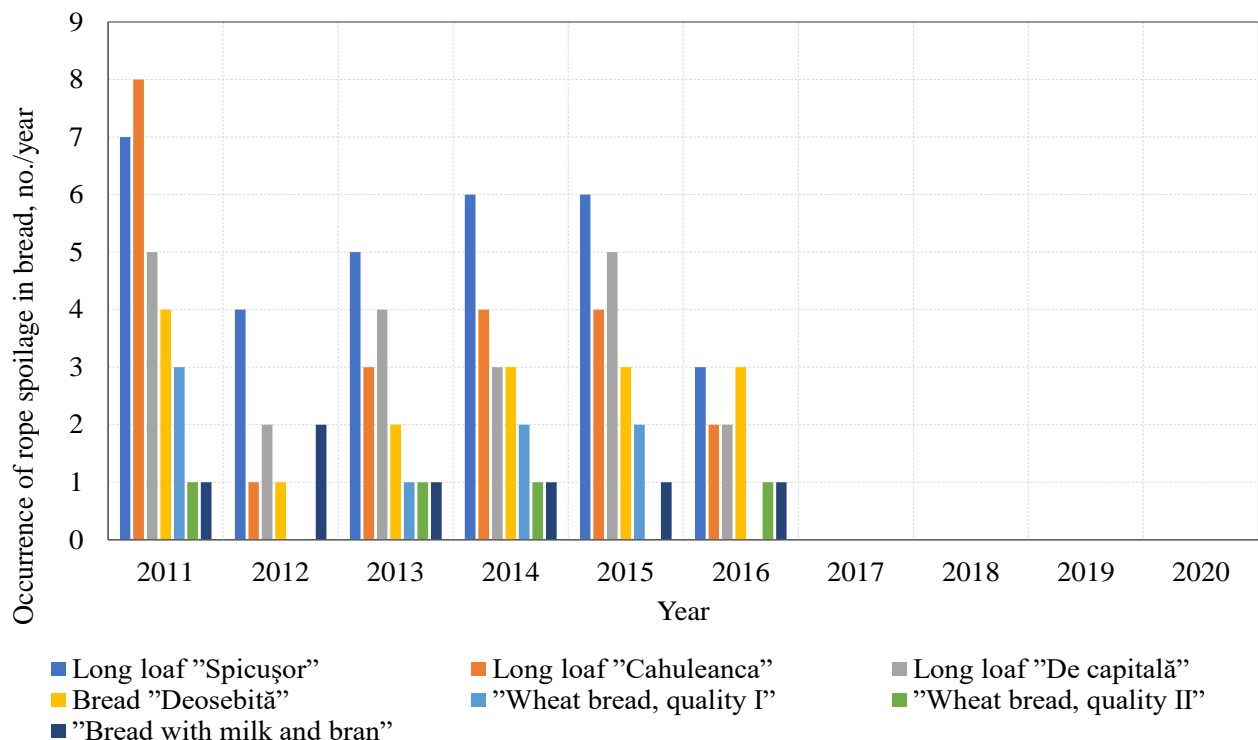


Figure 1. Frequency of occurrence of the rope spoilage in bakery products manufactured at the bakery company Cahulpan, Cahul, Republic of Moldova

Source: processing after data from Special registers [30, 31]

#### 4.2. Microbiological analysis of flour

Previous statement was confirmed by the microbiological analysis of six samples of flour of second quality from different batches, received at the Cahulpan company during the period

September–October 2013. The content of mesophilic aerobic spore-forming bacteria in the analyzed flour samples, expressed in C.F.U./g, is presented in Figure 2.

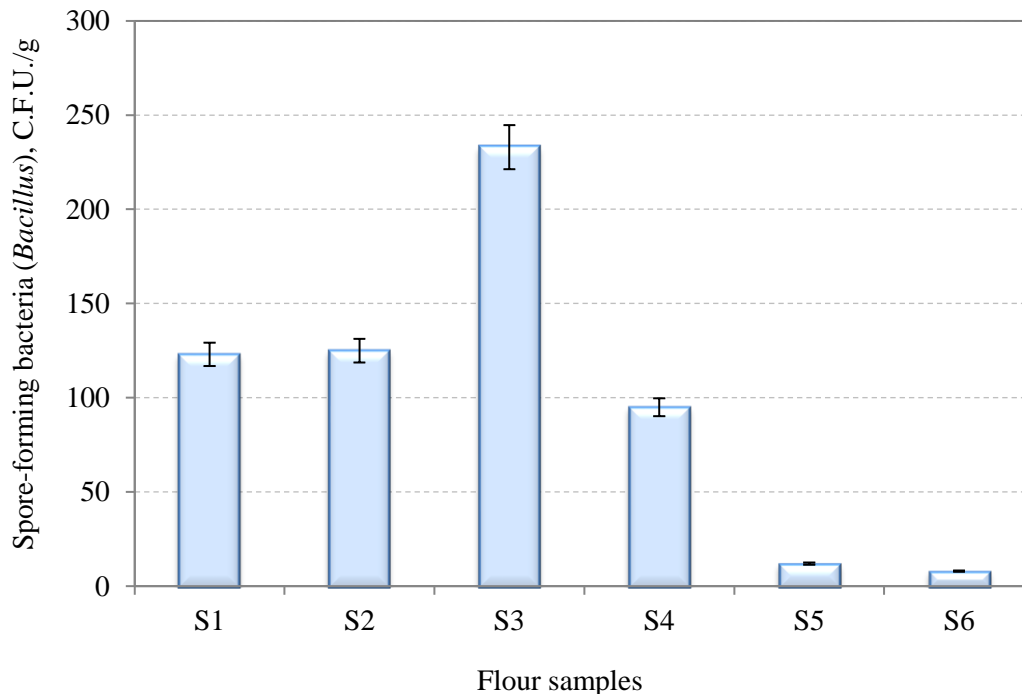


Figure 2. Degree of contamination of wheat flour with mesophilic aerobic spore-forming bacteria

Source: Authors' data processing

According to the data presented in Figure 2, the degree of flour contamination differed significantly ( $p < 0.05$ ) in the case of specific batches, e.g., the flour sample S3 contained  $230 \pm 17$  C.F.U./g and the flour sample S6 contained only  $8 \pm 3$  C.F.U./g.

The difference in the degree of contamination of the flour received by Cahulpan company can be explained through the following statements:

- Non-compliance with the storage conditions of the wheat, which can lead to triggering of the biochemical and microbiological processes that take place in the mass of stored cereals, diminishing their quality (e.g., self-heating). The total number of microorganisms in the grain mass increases [5, p. 403] and, as a result, the degree of contamination of the flour obtained from this wheat also increases;
- Non-compliance with the parameters of the technological process of flour manufacturing – no washing or insufficient washing of the wheat grains before the grinding;
- Non-compliance with the hygienic-sanitary conditions during the wheat processing – improper disinfection of equipment, disinsection and rodent control of rooms;
- Non-compliance with the storage conditions of flour, which, like wheat, may undergo a self-heating process which leads to the increase of the total number of microorganisms.

#### 4.3. Acidity of bread types

The acidity is determined for each batch and each baking product type, and it is registered in the official documents of the company. The acidity of the products affected by rope spoilage was also registered in the Special Registers. The values were selected from the documents and presented in Table 2 to see the values of acidity at which the rope spoilage was detected.

Table 1. Acidity of bakery products manufactured at Cahulpan company at which the rope spoilage was detected

| No. | Product                    | Type of flour used to manufacture the products                             | Acidity, degrees of acidity |               |         |
|-----|----------------------------|--|-----------------------------|---------------|---------|
|     |                            |  | Minimum                     | Medium        | Maximum |
| 1.  | Long loaf "Spicușor"       | High quality flour   | 1.2                         | $1.9 \pm 0.3$ | 2.2     |
| 2.  | Long loaf "Cahuleanca"     | Mixture: High quality flour – 65% + Flour of 1 <sup>st</sup> quality – 35% | 1.2                         | $1.7 \pm 0.3$ | 2.0     |
| 3.  | Long loaf "De capitală"    | High quality flour   | 1.2                         | $1.7 \pm 0.5$ | 2.2     |
| 4.  | Bread in forms "Deosebita" | High quality flour   | 1.0                         | $1.5 \pm 0.5$ | 2.0     |
| 5.  | Wheat bread, quality I     | Flour of 1 <sup>st</sup> quality   | 2.0                         | $2.5 \pm 0.5$ | 3.0     |
| 6.  | Wheat bread, quality II    | Flour of 2 <sup>nd</sup> quality   | 2.4                         | $2.9 \pm 0.5$ | 3.4     |
| 7.  | Bread with milk and bran   | Mixture: Flour of 1 <sup>st</sup> quality – 65% + bran – 35%               | 2.6                         | $3.2 \pm 0.6$ | 3.8     |

Source: processing data from Special Registers [30; 31]

### 5. Discussion

The discussion related to wheat flour contamination with spore-forming bacteria (point 4.1) can be used to explain the higher frequency of the occurrence of rope spoilage in long loaf types of bread (Figure 1). These baking products were made from flour with high extraction degree which had a lower acidity than wholemeal flour, for instance. The long loaf breads also had lower acidity, usually lower than 2.0 degrees of acidity, compared to bread made from flour of first and second quality, and/or with addition of bran.

According to GOST 27844-99 standard, the long loaf made from high quality flour must have at least 2.5 degrees of acidity [6]. Also, according to the requirements specified in the „Instruction for the prevention of rope spoilage in bakery products” [14], it is recommended to increase the acidity of bakery products made from wheat flour with one degree above the value indicated in the standard, which means that the long loaf bread during the summer period must have 3.5 degrees of acidity.

However, the increased acidity of the bread negatively influences its sensory properties (low volume, odour and sour taste, and brittle crumb) [17]. Therefore, according to the technological instructions established at Cahulpan, the maximum acidity during the summer period of the loaf should be 2.0-2.5 degrees, which in some cases (for example, when the degree of flour contamination is high) is not sufficient to prevent the development of the bacteria that cause the rope spoilage. The occurrence of rope spoilage in bread is possible especially if the acidity of the product is lower than recommended values, which can also be seen from the data presented in Table 1.

It is worth to emphasize that the values of acidity presented in Table 1 were determined for the ropy bread, meaning before 2017, and were discussed due to the influence on the occurrence of rope spoilage of bread. The acidity of bread measured for unspoiled bread was registered in ordinary registers and is not discussed in the paper.

To overcome the deficiency caused by low acidity of bread, the use of sourdough, whey or other natural acidulant can be applied during summer time. Also, the addition of Ca propionate was implemented in 2017 and the results are obvious: no ropy bread was detected since then.

Regarding the cooling of bread after baking, Rumeus & Turtoi (2016) showed its high influence on the occurrence of rope spoilage in bread and noticed that the faster the cooling and the lower the temperature of the environment were, the lower the incidence of ropiness was [17]. Thus, the goal of the delay or withdrawal of the rope spoilage of bread was reached due to the cross-contribution of discussed factors: type of bread, type of flour and its contamination with *Bacillus* spp., acidity, and of special measures of ropiness control such as cooling conditions after baking, especially time and temperature, and the use of Ca propionate as preservative.

### 6. Conclusions

Many consumers associate the quality of bakery products with their shelf life. The loss of the freshness of bread is due to several factors, one of the most important being the alteration caused by

microbial activity. Rope spoilage is considered one of the most common defects of bread caused by the activity of bacteria of the genus *Bacillus* from contaminated flour. If the degree of contamination of the flour is very high, then the first signs of rope spoilage (unpleasant odour, sticky crumb) can appear even after 6 hours of bread storage. Microbiological analysis to identify the batches of the contaminated flour with sporulated bacteria, at the reception in the company, requires a long duration (at least 48 hours). Therefore, the flour is usually received without initial microbiological analysis, which in some cases favours the occurrence of rope spoilage in bakery products manufactured at the Cahulpan company. However, the flour identified after the reception as highly contaminated with spore-forming bacteria, is mixed with flour free of contaminants or with reduced contamination for „diluting” the spore-forming bacteria and reducing the risk of rope spoilage.

Cases of the rapid spoilage of bakery products are very unwanted in businesses because they contribute significantly to the loss of consumer confidence in the quality of manufactured products and generate economic losses with immediate and long-term implications.

The acidity of bread and baking products lower than the recommended values that is 3.5 degrees of acidity during the summer period and the slow cooling process, at air temperature higher than 15°C and without forced circulation, increases the risk of rope spoilage. In 2017, Cahulpan company implemented the addition of Ca propionate as preservative and acidulant such as no rope bread was detected since then.

As a conclusion, Cahulpan bread-making company succeeded to delay or withdrawal the rope spoilage of bread as a result of cross-combination of several crucial factors such as the type of flour and its contamination with *Bacillus* spp., acidity, cooling conditions after baking and the use of Ca propionate as preservative.

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31. \* \* \* Registrul special **2015–prezent**. Registrul special pentru înregistrarea datelor referitoare la apariția bolii la „Cahulpan”, Cahul, Republica Moldova. (Special Register 2015–present. Special register for registration of data on the occurrence of the rope spoilage in "Cahulpan", Cahul, Republic of Moldova).

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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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- 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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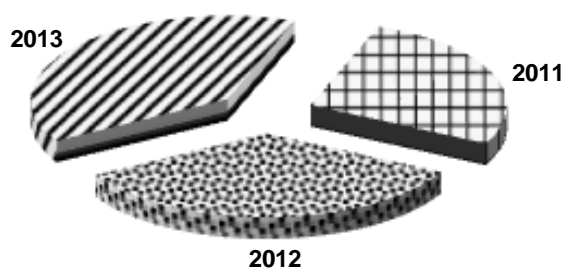


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TCACIUC, Cl., HACINA, L., GUȚU, A. Study on corporate social responsibility of cooperative enterprises in the Republic of Moldova, *Economy Transdisciplinarity Cognition*. 2012, 15 (1), 218-225. ISSN 2068-7389.
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