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Інноваційні підходи до управління фінансовими ресурсами підприємства: аналіз впровадження факторингу 9

М. Ільчук, Л. Березовська, Є. Іванов

Оптовий товарообіг продовольчих товарів в Україні: оцінка та прийняття управлінських рішень 22

О. Пащенко, О. Жарікова, О. Лимар, Д. Александров

Тенденції розвитку виробництва молока в Україні 39

В. Ніколенко

Міжнародний досвід функціонування ринку безалкогольних напоїв 58

О. Моргулець, Д. Григорчук, О. Нишенко

Готельний бізнес в контексті глобальних тенденцій 72

М. Гопка, О. Ковтун

Особливості впровадження управлінських критеріїв ESG у сільському господарстві України в контексті глобальних викликів та ЄС інтеграції 87

В. Івченко, Є. Ланченко, О. Носіков, О. Філоненко

Організація оплати праці на збиранні врожаю зернових культур у сільськогосподарських підприємствах 100

Contents

O. Moisiievych

Innovative approaches to the management of enterprise financial resources: Analysis of factoring implementation 9

M. Ilchuk, L. Berezovska, Ye. Ivanov

Wholesale turnover of food products in Ukraine: Assessment and managerial decision-making..... 22

O. Pashchenko, O. Zharikova, O. Lymar, D. Alexandrov

Milk production trends in Ukraine..... 39

V. Nikolenko

International experience in the functioning of the soft drinks market..... 58

O. Morhulets, D. Hryhorchuk, O. Nyshenko

Hotel business in the context of global trends..... 72

M. Hopka, O. Kovtun

Features of implementation of ESG management criteria in Ukrainian agriculture in the context of global challenges and EU integration..... 87

V. Ivchenko, Ye. Lanchenko, O. Nosikov, O. Filonenko

Organisation of labour remuneration during grain harvesting in agricultural enterprises..... 100

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Innovative approaches to the management of enterprise financial resources: Analysis of factoring implementation

Abstract. The study was aimed at investigating the mechanism of formation of financial resources and efficiency of their use, specifically in the context of using factoring to reduce the debt burden. Successful management of financial resources is critical for the stability and development of any company, as their efficient use allows not only maintaining financial stability but also achieving long-term goals. The purpose of this study was to introduce methods of optimisation of the financial condition on the example of LLC "Agrobuilding Alliance "Astra", with a focus on a new instrument for managing financial resources in Ukraine – factoring. Materials and methods of the study included qualitative and quantitative analysis of financial resources of the enterprise. The key materials used included the scientific studies of Ukrainian and foreign economists and financial reports of the company under study. The research methods included a comparative analysis of financial indicators before and after the introduction of factoring, modelling of financial flows (revenue), and evaluation of the efficiency of using this tool. The study employed financial analysis methods, such as financial stability and profitability analysis, as well as methods of horizontal and vertical analysis of the company's balance sheet, structural analysis of profits, and factor analysis of return on equity based on the impact of the financial leverage effect. The results of the study showed that the introduction of factoring reduced accounts receivable and improved the company's financial stability. The use of factoring as an innovative tool for Ukraine helped to optimise the financial position and analyse its impact on the company's financial performance. The practical significance of this study is to provide recommendations on the effective use of factoring to improve financial stability not only for the studied LLC, but also for other enterprises facing analogous challenges, since factoring is a relevant solution in the context of economic instability, as a tool that allows reducing the debt burden and ensuring the stability of financial flows of enterprises

Keywords: assets; management; company; capital; efficiency; accounts receivable; financing

INTRODUCTION

The need to investigate the mechanism of formation and efficient use of financial resources of enterprises is conditioned by the unfavourable economic conditions in which modern

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companies operate. Due to the rapid changes in the market environment, the significant impact of inflationary processes and the growth of the credit burden, the issue of effective management of financial assets and liabilities is becoming critical to ensure the financial stability and competitiveness of enterprises. Insufficient financial resources or poor management of financial resources leads to increased financial risks, including increased debt burden, liquidity problems, and insolvency.

At the same time, excessive dependence on external sources of financing, such as loans or contractual deferrals, can lead to a decrease in the financial flexibility of the enterprise and increase debt service costs (Shved *et al.*, 2024). The significance of the study lies in the development of effective methods for managing financial assets (cash, accounts receivable, investments) and liabilities (loans, payables) to optimise financial flows. Efficient use of financial resources will help businesses reduce their capital raising costs, increase their return on equity, and reduce the risk of bankruptcy, which are key objectives in an environment of economic instability. In the economic conditions of the 2020s, N. Hryniuk *et al.* (2021) concluded that the key to the stable development of the national economy is to strengthen the financial position of enterprises, as evidenced by the level of their financial security. The success of every business depends on how effectively it manages its resources. In a market environment, the efficiency of any enterprise depends not only on the number of resources it uses or receives, but primarily on the efficiency of managing these resources and the effectiveness of interaction between them. Many researchers focus on the development of policies for the formation of financial resources of enterprises through capital raising and optimisation of the structure of assets and liabilities. L. Solianyk *et al.* (2021) considered different approaches to the development of such a policy, the implementation of which would determine the final financial result of the enterprise. In the context of studying the issue of managing the financial policy of an enterprise, S. Kyrychenko & V. Zabiiaka (2023) believe that it is advisable to use factor analysis, specifically the principal components method, as it contributes to making informed decisions to achieve stability and high efficiency in the long term, as interest in the problem of efficient use of financial resources is growing, especially in the context of management decisions aimed at increasing the profitability and liquidity of enterprises.

I. Rumyk *et al.* (2023) pointed out that the availability of the necessary number of financial resources and their efficient use largely determines the financial stability and liquidity of the balance sheet of enterprises, while the required amount of these resources and their current and future efficiency are determined in financial analysis and planning. O. Velyka (2023) and N.V. Smyrnova & N.M. Kozub (2018) investigated the tasks of managing the capital structure. A prominent area of research is the optimisation of current assets, specifically the management of accounts receivable and payable, which is the subject of the studies by M. Zhovtobriukh (2022) and V. Rudyka *et al.* (2018). Effective management of these assets considerably reduces financial risks and ensures the continuity of the company's operations. Some researchers emphasise the significance of a systematic approach to financial resource management, which includes not only internal but also external factors, such as the business environment. S.N. Salamah (2023) noted that in a changing and complex business environment, effective financial management becomes a crucial factor in ensuring business continuity and improving company performance. K. Bakhodirovna (2021) argued that the effective structure of the national economy affects not only the content of the financial stability of the entire economy (which directly affects the financial condition of enterprises from the outside), but also the factors of its formation.

Furthermore, over the past 5-10 years, considerable attention has been paid to research aimed at using innovative financing methods to improve the efficiency of managing financial resources of enterprises. Methods such as venture capital or bank capital, grants or mortgages have been considered in the studies of Ukrainian researchers, such as O. Kondrat (2024) and M. Rushchyshyn (2023), and foreign researchers, such as A.-H. Darid (2024). One such method is factoring, which is actively used to optimise

accounts receivable management and improve liquidity (Moniruzzaman, 2023). Although this instrument is new to Ukraine, it has long proven effective in international practice as a means of reducing the financial burden and accelerate capital turnover. Thus, the demonstrated importance of an integrated approach to the formation and efficient use of financial resources of enterprises should include both conventional management methods and the introduction of innovative solutions that will allow enterprises to adapt to current market conditions and ensure their sustainable development. The purpose of this study was to investigate the ways of optimising the financial condition of ABA Astra LLC. To fulfil this purpose, the following tasks were performed: analysis of the company's financial resources and performance; assessment of the impact of factoring on reducing accounts receivable; development of recommendations for further use of this tool to ensure the stability of the company's financial resources.

MATERIALS AND METHODS

The study used both qualitative and quantitative methods of analysing the financial resources of enterprises. The key materials included the scientific studies of Ukrainian and foreign economists, financial statements of ABA Astra LLC for 2021-2023, obtained directly from the company on confidentiality terms and not published in open sources. The subject of the study was Agrobuilding Alliance Astra LLC, one of the largest suppliers and service operators of agricultural machinery in Ukraine, which has been operating in the market for over 20 years. The principal areas of activity are the sale of new and used agricultural machinery, warranty service and post-warranty service of agricultural machinery, and the sale of spare parts (Official website of ABA "Astra" LLC, n.d.).

As a typical sales company, the analysis focused on accounts receivable and accounts payable. A considerable share of the latter is related to the purchase of goods for resale and is typical for the industry. However, the relationship with debtors depends on the company's financial policy, while the management of the right to claim payment for goods sold depends on the company itself. Factoring is one of the tools of such management. The research methods included a comparative analysis of financial indicators before and after the introduction of factoring, modelling of financial flows (revenue), and assessment of the effectiveness of using an innovative financing instrument. Specifically, financial analysis methods were applied, such as financial stability and profitability analysis, as well as methods for assessing the impact of factoring on the financial condition of the enterprise.

The initial stage of the financial condition analysis was the study of the company's balance sheet, as it allows observing the specific features of the company's property and capital structure caused by the specifics of its activities (Rubezhanska & Hrechko, 2022). Changes in the balance sheet were briefly disclosed in the statement of financial position, and therefore analysing the revenue structure was the next step. Having considered the absolute performance indicators of the enterprise, the current financial position and performance were assessed on their basis using financial indicators – ratios. They helped to identify weaknesses in the company's operations and provide further recommendations for their elimination. O. Yatsukh & N. Zakharova (2018) described in detail the methodology for calculating liquidity, financial stability, and profitability indicators based on financial statements. Factoring was chosen as an instrument of influence on the financial condition of the research object. Its effectiveness is determined based on the cash flow it generates and the costs incurred to raise the instrument. Factoring service costs were calculated using Equation 1, which was adapted to the specifics of financing by a particular bank based on the study by V. Petrenko *et al.* (2021) and considers the financial costs of the service according to the terms of the factor (Official website of Radabank JSB, n.d.):

$$C_f = S_{ar} \times \left(\left(\frac{i}{T} \times t\right) + C_{fs}\right), \quad (1)$$

where C_f is the cost of factoring services, thsd UAH, %; S_{ar} is the sum of financing of accounts receivable; i is the advance payment (8% was used for calculation); T is the period of factoring services, days; C_{fs} is the commission for factoring services.

When working with factoring, the inequality should be observed – the gross profit on factoring should be greater than the factoring costs, which follows from the basic definition of profit (Jayathilaka, 2020). Therefore, it is necessary to determine the gross profit from the use of factoring, which is calculated using Equation 2:

$$GP_f = (R_s \times S_{ar}) + \left(SF \times S_{ar} \times C_{\frac{gp}{sc}}\right), \quad (2)$$

where GP_f is the gross profit, thsd UAH; R_s is the return on sales; SF is the amount of financing from factoring in shares; is the indicator reflecting the ratio of gross profit to cost of sales.

For further comparison, the indicator of additional profit from the use of released funds was applied according to Equation 3:

$$AP = R_{ar} \times P, \quad (3)$$

where AP is the additional profit from the released funds, thsd UAH; P is the return on investment, rate of return, %; R_{ar} is the amount of released funds from accounts receivable, thsd UAH.

To evaluate the impact of factoring on the turnover of accounts receivable, the additional accounts receivable ratio was calculated, which allows estimating the amount of accounts receivable released as a result of factoring using Equation 4:

$$R_{rel} = (TP_{ar0} - TP_{ar1}) \times \frac{Q_p}{T}, \quad (4)$$

where R_{rel} is the accounts receivable release ratio; TP_{ar1} and TP_{ar0} are the period of one turnover in the reporting and planning periods, days; Q_p is the factual volume of pWroducts sold, thsd UAH; T is the number of days in the reporting period, days.

RESULTS AND DISCUSSION

It was found that during the company's economic activity, financial resources make a cycle consisting of several stages: attracting financial resources, accumulating financial resources, and investing for further attraction of financial resources (Sytnyk *et al*., 2020). There can be an infinite number of such cycles. Financial resources management is a system of management principles and methods, the development and implementation of which will ensure its stable financial position and efficient operation. The primary purpose of management is to choose rational forms of financial resources, considering the conditions and specific features of the enterprise's economic activity, as well as to maximise profits and increase the total value of the enterprise (Bortnikova & Chyrkova, 2021). The financial analysis of the company's property (assets) and sources of its formation (liabilities) was the first stage and an essential practice for assessing the company's financial position and making informed business decisions. The analysis helped to comprehensively analyse the financial stability and performance of the company.

First of all, the study considered the structure and dynamics of the assets of the LLC under study for 2021-2023 (Table 1).

Table 1. Analysis of the composition and structure of ABA Astra LLC's assets for 2021-2023

Indicators	Period, years						Deviations by year			
	2021		2022		2023		2022/21		2023/21	
	thsd UAH	%	thsd UAH	%	thsd UAH	%	thsd UAH	%	thsd UAH	%
Intangible assets	2,162	0.3	1,386	0.2	1,004	0.1	−776	−0.1	−1,158	−0.2
Property, plant, and equipment	79,666	10.9	60,474	7.9	104,680	11.0	−19,192	−3.0	25,014	0.1
Other non-current assets	3	0.0	3	0.0	5,049	0.5	0	0.0	5,046	0.5
Non-current assets	**81,831**	**11.2**	**61,863**	**8.1**	**110,733**	**11.6**	**−19,968**	**−3.1**	**28,902**	**0.4**
Inventory	393,548	53.8	421,186	55.2	603,671	63.2	27,638	1.4	210,123	9.4
Accounts receivable	173,365	23.7	215,794	28.3	155,972	16.3	42,429	4.6	−17,393	−7.4
Cash	10,488	1.4	7,269	1.0	21,386	2.2	−3,219	−0.5	10,898	0.8

Table 1, Continued

Indicators	Period, years						Deviations by year			
	2021		2022		2023		2022/21		2023/21	
	thsd UAH	%	thsd UAH	%	thsd UAH	%	thsd UAH	%	thsd UAH	%
Prepaid expenses	40,701	5.6	41,007	5.4	38,904	4.1	306	−0.2	−1,797	−1.5
Other current assets	32,180	4.4	16,313	2.1	25,093	2.6	−15,867	−2.3	−7,087	−1.8
Current assets	**650,282**	**88.8**	**701,569**	**91.9**	**845,026**	**88.4**	**51,287**	**3.1**	**194,744**	**−0.4**
Balance	**732,113**	**100.0**	**763,432**	**100.0**	**955,759**	**100.0**	**31,319**	**0.0**	**223,646**	**0.0**

Source: calculated by the author of this study

According to the data in Table 1, the main share of the property structure comprises current assets – over 88%. Property, plant, and equipment accounted for 11% in 2023, 8% – in 2022, and 11% – in 2021; current assets in 2023 consisted mainly of inventories, which accounted for 63%. In 2023, accounts receivable amounted to UAH 155 million, which is 16% of total assets, while cash amounted to UAH 21 million, which is 2% of total assets. It is also important to note that the seasonal nature of the company's suppliers and customers results in significant deferred expenses. The company is characterised by a high proportion of current assets and a relatively low proportion of non-current assets, as the company's business is based on the resale of goods. Apart from reviewing the company's assets, the study analysed the company's capital formation to assess its financial stability, i.e., its ability to repay its debts. The study also analysed the company's capital structure and identified possible risks associated with its use (Table 2).

Table 2. Analysis of the composition and structure of equity and liabilities of ABA Astra LLC for 2021-2023

Indicators	Period, years						Deviations by year			
	2021		2022		2023		2022/21		2023/21	
	thsd UAH	%	thsd UAH	%	thsd UAH	%	thsd UAH	%	thsd UAH	%
Share capital	58,062	7.9	58,062	7.6	58,062	6.1	0	−0.3	0	−1.9
Additional capital	432	0.1	432	0.1	432	0.0	0	0.0	0	0.0
Retained earnings	−17,835	−2.4	3,137	0.4	48,913	5.1	20,972	2.8	66,748	7.6
Equity	**40,659**	**5.6**	**61,631**	**8.1**	**107,407**	**11.2**	**20,972**	**2.5**	**66,748**	**5.7**
Long-term liabilities	**0**	**0**	**0**	**0**	**5,934**	**0.6**	**0.0**	**0.0**	**5,934**	**0.6**
Short-term loans	45,185	6.2	111,094	14.6	196,286	20.5	65,909	8.4	151,101	14.4
Current accounts payable	638,432	87.2	583,049	76.4	635,053	66.4	−55,383	−10.8	−3,379	−20.8
Current provisions	2,166	0.3	1,774	0.2	5,215	0.5	−392	−0.1	3,049	0.2
Other current liabilities	5,671	0.8	5,884	0.8	5,864	0.6	213	0.0	193	−0.2
Current liabilities	**691,454**	**94.4**	**701,801**	**91.9**	**842,418**	**88.1**	**10,347**	**−2.5**	**150,964**	**−6.3**
Balance	**732,113**	**100.0**	**763,432**	**100.0**	**955,759**	**100**	**31,319**	**0**	**223,646**	**0**

Source: built and calculated by the author of this study

Table 2 shows that borrowed funds are the main source of the company's assets, with a share of over 91% in the balance sheet, including accounts payable with a share of 82% in 2021, 76% – in 2022, and 63% – in 2023. In 2023, long-term capital also appeared in the form of other long-term liabilities with a share of 0.6% in equity. Shareholders' equity was less than 9%, with the largest share of property sources coming from the unchanged share capital of

UAH 58 million. Based on the study of the components of the company's profit for 2020-2023, an overview of the company's economic situation was calculated (Table 3).

Table 3. Economic indicators of ABA Astra LLC for 2021-2023

Indicators	Period, years			Deviations by year		Rate of change by years, %	
	2021	2022	2023	2022/21	2023/21	2022/21	2023/21
Sales revenue	1,616,597	1,946,388	2,132,845	329,791	516,248	20.4	31.9
Cost of revenue	1,385,381	1,507,470	1,708,232	122,089	322,851	8.8	23.3
Gross profit	**231,216**	**438,918**	**424,613**	**207,702**	**193,397**	**89.8**	**83.6**
Operating profit	**45,832**	**37,660**	**64,105**	**–8,172**	**18,273**	**–17.8**	**39.9**
Profit before taxation	32,479	37,660	50,063	5,181	17,584	16.0	54.1
Net profit	**24,824**	**20,972**	**45,708**	**–3,852**	**20,884**	**–15.5**	**84.1**

Source: built and calculated by the author of this study

It was considered that sales revenue increased by 31.9% in 2023 compared to 2021 and amounted to UAH 2,133 million. Gross profit in 2023 amounted to UAH 425 million, which is 84% higher than in 2021. In 2022, operating profit decreased by UAH 8 million to UAH 38 million, while in 2023, on the contrary, it increased by UAH 18 million to UAH 64 million. Profit before taxation, in contrast to profit from operations, only grew, reaching UAH 50 million in 2023. In 2023, net profit amounted to UAH 46 million, up by UAH 25 million year-on-year. The growth of net profit is a positive factor and suggests a positive trend in the development of the enterprise (Nogoibaeva *et al.*, 2024). The next step was to calculate and study the company's profitability indicators (Table 4).

Table 4. Indicators for assessing the profitability of ABA Astra LLC for 2021-2023

Indicators	Period, years		
	2021	2022	2023
Profitability, %:			
products	14.3	22.6	19.9
assets	3.4	2.7	4.8
equity	61.1	34.0	42.6

Source: compiled by the author of this study

The data obtained showed that the company's profitability is unstable. Product profitability increased by 5.6% to 19.9% between 2021 and 2023, while return on assets increased by 1.4% to 4.8% in 2023, which suggests a decrease in the cost of production relative to sales and is a positive factor. However, the return on equity decreased by 18.5% to 42.6%, indicating a slower growth in net profit compared to equity and showing a breakdown in the effective link between asset, revenue, and profit growth. The efficiency of the enterprise is characterised by the availability of sufficient equity capital, solvency, and adequate financial stability, which is characterised by indicators of turnover and profitability: internal and external factors (Pravdiuk *et al.*, 2019). The factors that influence the efficiency of capital use in the production process of an enterprise were evaluated. The study determined the impact of using borrowed funds. In connection with the use of external financing, the concept of "financial leverage" is considered, i.e., the limits of the enterprise's ability to improve its performance through external financing (Table 5).

Table 5. Calculation of the effect of financial leverage

Indicator	Period, years			Growth rate by year, %		Change by year	
	2021	2022	2023	2022	2023	2022	2023
Total assets, gross	732,113	763,432	955,759	104.3	125.2	31,319	223,646
Average amount of equity	28,256	51,145	84,519	181.0	165.3	22,889	56,263
Average amount of capital raised	700,147	696,628	775,077	99.5	111.3	−3,519	74,930
EBIT	46,362	47,252	63,753	101.9	134.9	890	17,391
Net profit	24,824	20,972	45,708	84.5	217.9	−3,852	20,884
Current tax	7,655	16,688	4,355	218.0	26.1	9,033	−3,300
Total financial expenses	13,883	9,592	13,690	69.1	142.7	−4,291	−193
Economic return on assets, %	3.39	2.75	4.78	81.0	174.1	−0.64	1.39
Interest rate on the loan, %	30.72	8.63	9.25	28.1	107.1	−22.09	−21.47
Tax corrector	0.82	0.82	0.82	100.0	100.0	0	0
Income tax rate	0.18	0.18	0.18	100.0	100.0	0	0
Financial differential	−27.33	−5.89	−4.47	21.5	75.9	21.45	22.86
Lever arm	24.78	13.62	9.17	55.0	67.3	−11.16	−15.61
Effect of financial leverage, %	**−555.39**	**−65.75**	**−33.59**	**11.8**	**51.1**	**489.64**	**521.8**
Return on equity, %	87.85	41.00	54.08	46.7	131.9	−46.85	−33.77

Source: built and calculated by the author of this study based on Tables 1, 2, and 3

When calculating the effect of financial leverage, a positive trend was observed, with the value gradually increasing from – 555.39% to – 33.59%. The effect of financial leverage stayed negative in 2023, which meant a decrease in the return on equity (Didukh & Fedorova, 2023). The study also calculated the use of equity and debt capital of the enterprise (Table 6).

Table 6. Analysis of the capital structure of ABA Astra LLC

Indicator	Period, years			Growth rate by year, %		Change by year	
	2021	2022	2023	2022	2023	2022	2023
Financial stability ratio	0.04	0.07	0.1	176.3	148.8	0.03	0.03
Financial risk ratio	24.8	13.6	9.2	55.0	67.3	−11.16	−4.45
Autonomy ratio	0.04	0.07	0.1	176.3	143.8	0.03	0.03
Return on equity, %	87.85	41	54.08	46.7	131.9	−46.85	13.08
Leverage ratio	0.96	0.93	0.9	96.9	97.0	−0.03	−0.03
Borrowing ratio	0.06	0.15	0.21	235.8	141.1	0.08	0.06
Debt to sales ratio	0.43	0.36	0.36	82.6	101.5	−0.08	0.01

Source: compiled by the author of this study based on Tables 1, 2, and 3

During 2021-2023, the company's financial performance showed "alarming" trends. Despite the stability of its autonomy and financial strength ratios, which stay low, the high financial risk ratio indicates a need to adjust its debt structure. Return on equity decreased considerably, suggesting less efficient use of capital. Financial dependency and leverage ratios exceed the recommended limits, which may adversely affect the creditworthiness. Overall, the company

should focus on optimising its capital structure and increasing the efficiency of its financial resources to improve financial stability.

After the analysis, it is necessary to identify the risks associated with the enterprise's activities that considerably affect management decision-making in the field of financial policy formation and implementation. It was found that the company's activities are characterised by the following: increased competitor activity; the risk of interruptions in financing current operations due to high levels of accounts receivable; dependence on major foreign suppliers and the parent company; rising costs of imported machinery and spare parts due to currency fluctuations; low investment attractiveness; and the instability of the political and economic situation in Ukraine. High accounts receivable was identified as a financially significant problem (Danylenko *et al*., 2019). Striving to reduce it as much as possible is one of the ways a company manages its financial resources. Accounts receivable at the end of 2023 amounted to UAH 156 million. With a sales margin of 20%, this meant that the company did not receive UAH 31.2 million in gross income. This part of financial resources is frozen in accounts receivable. Thus, the main task in the field of accounts receivable management of the LLC under study in late 2023 – early 2024 was to optimise the structure and quality of accounts receivable.

Based on the findings of the balance sheet analysis, the company will not be able to gain more access to standard forms of credit to replenish working capital for the following reasons: 90% dependence on short-term borrowings, including loans and debts to creditors to finance the business; insufficient collateral for new loan amounts. In this regard, factoring should be chosen as a means of managing the accounts receivable. The first step in concluding a factoring agreement is to determine the optimum funding limit, i.e., the number of accounts receivable that the company will transfer to the factor (Derevianko, 2020). The optimum funding limit for factoring is minimal or no accounts receivable. This means that sales exceed the number of days in the reporting period, while the sales period is zero. The funding limit is also influenced by the bank's interest in delegating part of the risk of non-payment to the client. Thus, banks usually finance deliveries of up to 90% of the total amount. In this regard, the LLC under study cannot achieve complete "liquidation" of the debt through factoring. Let us calculate the costs of factoring services provided by Radabank for an enterprise with a financing amount of UAH 75 million, a commission of 0.12% of the transaction value, and an advance fee of 0.5-8.0% of the transaction value (current factoring service rates) (Official website of Radabank JSB, n.d.).

Using Equation 1, the factoring costs will be as follows:

$$C_f = \left(\left(\frac{0.08}{365} \times 30\right) + 0.0012\right) \times \\ \times 75{,}000{,}000 = 583{,}151 \text{ UAH}$$

Assuming that R_s and $C\frac{gp}{c}$ are constants and S_{ar} is a variable, the value of gross profit from factoring will be determined using Equation 2 as follows:

$$GP_f = (0.2 \times 75{,}000{,}000) + (0.9 \times 75{,}000{,}000 \times \\ \times 0.2486) = 31{,}780{,}500 \text{ UAH}$$

The inequality is respected, which is in line with the requirements when working with factoring. Let us determine whether a factoring operation is profitable for the company under study. For this, let us compare the costs of factoring with the amount of additional profit from the introduction of factoring.

The bank provides 90% of the loan amount at 8% per annum. The enterprise can invest free funds for an analogous period (1 year) in PrivatBank JSC at 8.25% per annum (Official website of PrivatBank CB JSC, n.d.), the profit from which is calculated using the Equation 3:

$$AP = (75{,}000{,}000 - 583{,}151) \times \\ \times 0.0825 = 6{,}139{,}390 \text{ UAH}$$

Therefore, the additional profit will also be higher than the factoring costs. Within the framework of the analysis, let us assess the level and composition of the company's accounts receivable before and after the proposed measures for the LLC, considering the dynamics of changes in key indicators (Table 7).

Table 7. Comparison of accounts receivable utilisation before and after factoring

Indicators	Period, years		Deviation	
	2023	2024	absolute	relative, %
Revenue	2,132,845	2,452,772	319,927	15
Cost of sales	1,708,232	2,049,878	341,646	20
Accounts receivable	155,972	80,972	−75,000	−48.1
Total current assets	845,026	837,526	−7,500	−0.9
Share of accounts receivable in current assets	18.5	9.7	−8.8	−47.6
Turnover ratio	13.7	30.3	16.6	121.5
Accounts receivable turnover period, days	26.3	11.9	−14.4	−54.9

Source: created by the author of this study

Analysis of Table 7 shows that accounts receivable as a percentage of total current assets decreased by 8.8%. Thus, factoring helped to "free up" additional financial resources in the amount of UAH 75 million.

The analysis also shows that as a result of the proposed measures, accounts receivable will be reduced by 48% to UAH 81 million in 2024. The reduction in the turnover period from 26 to 12 days is evidence of effective accounts receivable management. The final performance indicator is the accounts receivable release ratio, calculated using Equation 4:

$$R_{rel} = (26.3 - 11.9) \times \frac{2,132,845}{366} = \\ = 83,915 \text{ thsd UAH}$$

Thus, as a result of factoring accounts receivable, the company released an amount of UAH 84 million. By the beginning of 2024, factoring can be considered virtually the main tool for managing accounts receivable at an enterprise (Onaepemipo *et al.*, 2019). Assessing its flexibility and effectiveness, in the current environment, attracting additional external sources of funding, including short-term ones, is less expedient. The study analysed the impact of factoring implementation on the company's financial position. The effect of using the financial instrument was measured by the funds released from turnover (i.e., no longer "frozen" in accounts receivable), and the effectiveness of implementation was determined based on the debt release ratio. Unlike other studies, such as the research by A. Kravtsov (2022), where attention was focused on the change in liquidity indicators of the enterprise before and after the introduction of factoring, the approach presented in the current was more suitable for assessing the financial effect for a company engaged in the sale of goods, i.e., the main asset item is inventory rather than debts of debtors for services.

A. Kravtsov (2022) investigated a company engaged in the sale of electricity, where the structure of assets and capital is considerably different from that of the enterprise under the current study. Accordingly, the use of liquidity indicators as the principal indicator of factoring efficiency in this case is not optimal, since for a company with a different business profile, factoring is primarily associated with improving capital turnover. Considering the limited modern research on factoring in terms of its financial impact on an individual company, as well as the underdevelopment of the instrument in Ukraine, I. Doloh (2019) described in detail the process of restructuring the accounts receivable of a construction company as a result of attracting factoring financing, as well as determined the costs of obtaining such financing. The result of such a study was the determination of the amount of released working capital, which is compared with the amount of debt. In contrast to the study of A. Kravtsov (2022), in the study of I. Doloh (2019), the indicator of the efficiency of using factoring was the factoring commercial effect ratio, which was defined as the quotient of dividing the amount of funds released during the factoring operation and the total level of accounts receivable. This approach resembles the valuation methodology used in the present study, although the substantial difference is that the object of study in I. Doloh (2019) is a construction company engaged in the execution

of works and whose main asset is accounts receivable, which is different from the sales asset of the LLC under study.

Accordingly, the methodologies used in the cited studies can be only partially compared with the findings of the present study. Therewith, this emphasises the significance of using such studies as a basis for comparing the results of the current study. Despite the differences in approaches to assessing the effectiveness of factoring, the conclusions of many researchers on the effectiveness of using factoring as a tool to improve the management of financial resources were confirmed. However, the effectiveness of this tool depends largely on the specifics of the company and its industry – to achieve maximum results, factoring should be used in conjunction with other financial instruments and financial resource management strategies. N. Mamontova & M. Tataryn (2023) also note the importance of legal and accounting aspects of factoring operations in Ukraine. According to the researchers, there is a problem that the method of proper conduct of these services has not been approved legislatively. Furthermore, it is vital to consider the type of factoring operations in the accounting of factoring transactions, as this affects not only accounting entries but also the amount of commission. A prominent area of focus is control, which should take place not only during the transfer, but also before, to ensure that the debtor company has accurate information about the debt. M. Holub (2024) proposes the introduction of a special regulation 'On Factoring' and the corresponding amendments to existing legislative acts. This will allow factoring to be legislated as a separate financial service and, considering the pace of factoring development in Ukraine, will make it possible to implement European legislation in the field of domestic regulation of factoring services (Knowledge guide on factoring regulation and supervision, 2023). With a high proportion of accounts receivable, factoring is an effective tool for improving the financial position of an enterprise. Its use helps to accelerate capital turnover and increase liquidity, reducing the risks associated with non-payments. Research confirms that factoring can be a self-sufficient tool for optimising a company's financial resources without the need for other financial measures or strategies.

CONCLUSIONS

The study investigated innovative approaches to management of financial resources of an enterprise on the example of introduction of factoring into the activities of ABA Astra LLC. The use of factoring to manage accounts receivable proved to be an effective tool for optimising financial resources. As a result, the company received additional financial resources of UAH 75 million, while the share of accounts receivable in current assets decreased by 9%. The reduction in accounts receivable turnover from 26 days to 12 days reflects improved cash flow management. A significant result of the factoring implementation was a 48% reduction in accounts receivable in 2024, which allowed the company to free up about UAH 84 million from its turnover. This increased the turnover of settlements with the company's debtors, which is vital in the current conditions of economic uncertainty.

The introduction of factoring also positively affects the overall financial position of the company, which allows it to increase its competitiveness in the market. It was also proved that factoring allows reducing the company's dependence on external financing in the form of loans, which reduces the cost of servicing debt obligations. This helps to improve financial stability and increase the efficiency of financial management in an unstable economic environment. Using factoring as a permanent tool for managing accounts receivable helps to reduce financial risks and increase the company's flexibility in managing its resources.

Thus, the purpose of this study was fulfilled. The introduction of factoring not only reduced accounts receivable and freed up considerable financial resources, but also positively influenced the company's overall financial stability. Further investigation of factoring as a financial management tool is a promising area, as it provides opportunities to increase the competitiveness of Ukrainian enterprises, specifically in the field of sales of goods and services. The recommendations proposed in this study can be useful both for practitioners in search for new methods of optimising financial resources and for researchers studying financial management and tools for improving the financial condition of enterprises.

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CONFLICT OF INTEREST

None.

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Інноваційні підходи до управління фінансовими ресурсами підприємства: аналіз впровадження факторингу

Анотація. Стаття спрямована на вивчення механізму формування фінансових ресурсів та ефективності їх використання, зокрема в контексті застосування факторингу для зменшення боргового навантаження. Успішне управління фінансовими ресурсами є критично важливим для стабільності та розвитку будь-якої компанії, оскільки їх ефективне використання дозволяє не лише зберігати фінансову стійкість, але й досягати довгострокових цілей. Метою статті було впровадження методів оптимізації фінансового стану на прикладі ТОВ «Агробудівельний альянс «Астра», з акцентом на новий для України інструмент управління фінансовими ресурсами – факторинг. Матеріали та методи дослідження включали якісний та кількісний аналіз фінансових ресурсів підприємства. В якості основних матеріалів використовувалися наукові праці українських та зарубіжних вчених-економістів та фінансові звіти досліджуваної компанії. Методи дослідження залучали порівняльний аналіз фінансових показників до та після впровадження факторингу, моделювання фінансових потоків (виручки) та оцінку ефективності використання цього інструменту. В роботі застосовувалися методи фінансового аналізу, такі як аналіз фінансової стійкості та рентабельності, а також методи горизонтального та вертикального аналізу балансу компанії, структурний аналіз прибутку, факторний аналіз рентабельності власного капіталу на основі впливу ефекту фінансового важеля. Результати дослідження показали, що впровадження факторингу зменшило дебіторську заборгованість та покращило фінансову стійкість компанії. Застосування факторингу як інноваційного для України інструменту сприяло оптимізації фінансового стану, допомогло проаналізувати його вплив на фінансові показники підприємства. Практична значимість дослідження полягала в наданні рекомендацій щодо ефективного застосування факторингу для підвищення фінансової стійкості не лише для досліджуваного ТОВ, а й для інших підприємств, що зіштовхуються з подібними викликами, адже факторинг є актуальним рішенням в умовах економічної нестабільності, як інструмент, що дозволяє зменшити боргове навантаження та забезпечити стабільність фінансових потоків підприємств

Ключові слова: активи; менеджмент; компанія; капітал; ефективність; дебіторська заборгованість; фінансування

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Wholesale turnover of food products in Ukraine: Assessment and managerial decision-making

Abstract. The decline in Ukraine's wholesale food turnover caused by the occupation of fertile land in the South and East, the destruction of agricultural enterprises, logistical problems, and mass emigration have become a serious issue that not only threatens food shortages and price increases, but also poses a threat to the food security of the population. Therefore, investigation into the causes and consequences of this phenomenon is extremely relevant. The purpose of this study was to identify the factors that determine the dynamics of wholesale turnover of food products in Ukraine, with further formulation of proposals to improve the efficiency of wholesale enterprises through managerial decision-making. The study was based on the comprehensive use of such methods as empirical data collection and analysis, bibliographic analysis of scientific literature, economic and statistical methods, including regression analysis, as well as the method of logical generalisation to systematise the results and formulate conclusions. The study identified the key factors that influence the volume of wholesale food turnover and are critical for ensuring the country's food security. Economic analysis helped identify patterns and trends in the dynamics of turnover, while regression analysis helped quantify the impact of the identified factors and develop recommendations for managing this process. It was proposed to intensify the state regulation aimed at creating favourable conditions for the development of wholesale trade, combined with the modernisation of management processes at the level of wholesale

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enterprises. It was found that innovative approaches to cooperation with retail chains, such as in-depth analysis of their needs, optimisation of the assortment, building long-term relationships, and introduction of modern technologies, are valuable factors that influence the efficiency of management of wholesale enterprises. To ensure their sustainable development in the future, it is necessary to apply effective marketing strategies. The findings obtained in this study are of high practical significance for business entities engaged in wholesale trade in food products, as they allow making effective managerial decisions to increase the volume of wholesale turnover

Keywords: wholesale trade; products; marketing strategies; innovative approaches; competitiveness

INTRODUCTION

The turnover of food products is not only an internal indicator of an enterprise's efficiency, but also a prominent social indicator that directly affects the standard of living of the population. A decline in this indicator could lead to a shortage of goods, rising prices, and, as a result, a threat to the country's food security. The war caused irreparable damage to the Ukrainian agricultural sector. The occupation, destruction of agricultural enterprises, logistical problems, and mass emigration of the population have led to a considerable reduction in food production and a decrease in wholesale food turnover. In the context of a full-scale war, there was an urgent need to develop original approaches to the organisation of trade and trade relations, which stimulated relevant research.

M. Rahman & D. Prus (2020) noted the significance of increasing wholesale turnover to stimulate the country's economic growth in a crisis. According to researchers, the fact that Ukrainian products are in greater demand during the crisis is helping to boost the economy. Since trade is a powerful lever of economic development and an essential tool for ensuring food security, many studies by Ukrainian and foreign researchers are devoted to public administration in this area, as well as food security management. S. Kvasha *et al.* (2024) predicted the threat of a decline in food security in Ukraine in the medium term, which highlights the need to take urgent measures to address this trend and ensure a stable food situation in the country, especially in the context of military aggression.

According to S. Sirenko (2023), the problems and imbalances in trade development have arisen as a result of inadequate state attention to this area. O. Skydan *et al.* (2020) believe that the current model of food security regulation in Ukraine is fragmented, as it does not consider the interconnections between the various components of this problem, which leads to its inefficiency and inability to ensure the country's long-term food security. To ensure food security, it is necessary to integrate various government policies into a single system, such as the development of agriculture, the food industry, foreign food trade, and the internal market, as well as ensuring food quality and safety. V. Franchuk *et al.* (2022), based on the calculation of the Pearson correlation coefficient, identified the principal problems in ensuring food security in Ukraine, namely: the unsatisfactory level of research in agriculture; imperfect infrastructure in supply chains and the presence of political and social barriers to entry into the agricultural market. Insufficient food security and imperfect market access policies.

O. Kovalenko & A. Kyrychenko (2023) proposed to use digital technologies as a key tool to address the problem of global food security, which is exacerbated by changes in the logistics of food supply. O. Bokii (2023) believed that to overcome the adverse effects of Russian aggression on the food market, it is necessary to implement an effective state food policy aimed at eliminating the consequences, restoring production capacity and ensuring food security of the population, as statutory regulation should be focused on creating favourable conditions for doing business and protecting socially vulnerable groups of the population. A comprehensive approach to restoring the agricultural sector of the economy should be based on the implementation of a state programme that will cover all aspects of food production and consumption. V. Boiko *et al.* (2019), based on the positive experience of wholesale food markets in Poland, substantiated the feasibility of building them in

Ukraine. The primary benefits of such wholesale markets include improved food quality, price control, more efficient budgeting, increased competition in the consumer market, faster promotion of products to consumers, creation of new jobs, economic security of producers, and satisfaction of consumer demand for quality food. In their study of food security, Y. Mishenin *et al.* (2023) focused on public health. The researchers proposed that the organisational and economic mechanism for regulating sustainable food security should be developed with due regard for the harmonisation of the socio-ecological and economic needs and interests of business entities, society, and citizens involved in the production and consumption of food.

While conventional food security research has largely focused on agricultural production, food availability, and accessibility, and factors related to nutrition and health, B. Alkunain *et al.* (2024) takes a fresh look at this issue, emphasising the link between overall expenditure and food security. The researchers examined the impact of investment on food security in Saudi Arabia and concluded that consumption and government spending do not directly affect food availability in this country but have an indirect impact on it. Despite the numerous scientific publications related to trade, food security, and public administration, the issues of wholesale food turnover and effective management of the process require further scientific understanding. The purpose of this study was to identify factors influencing the volume of wholesale turnover of food products in Ukraine to develop recommendations for optimising management decisions at wholesale enterprises.

MATERIALS AND METHODS

The following methods were employed to conduct the study: data collection and analysis (desk research), bibliographic method, economic analysis, regression analysis, and logical generalisation method. The desk research method involved the use of data from the State Statistics Service of Ukraine for 2010-2022, which concerned the volume of sales and stocks of goods (products) at wholesale trade enterprises (Official website of the State Statistics of Ukraine, 2023), the volume of products (goods, services) sold by business entities by type of economic activity, wholesale and retail turnover of enterprises – wholesale and retail trade (Official website of the State Statistics of Ukraine, 2024), the number of operating business entities by type of economic activity (Official website of the State Statistics of Ukraine, 2023a). The number of employees (Official website of the State Statistics of Ukraine, 2023b), non-current assets of enterprises with a breakdown into large, medium, small, and micro enterprises (Non-current assets, n.d.). The study was conducted using the Instruction of the State Statistics Committee of Ukraine on filling in the state statistical observation form No. 1-opt "Report on sales and stocks of goods (products) in wholesale trade" (Report of the State Statistics Committee of Ukraine..., 2013) and the Order "Classification of economic activities: DK 009:2010" of the State Committee of Ukraine on Technical Regulation and Consumer Policy (Order of the State Committee of Ukraine on Technical Regulation..., 2010). The data obtained during the desk research served as the basis for economic and regression analysis, which helped to formulate scientific hypotheses and conclusions.

The bibliographic method was used to collect and analyse data, as it involves the systematic study of various types of documents (scientific articles, regulations, statistical collections, Internet resources) to obtain information about a particular phenomenon, process, or object. This method was employed to draft the introduction and discussion section of this study, to identify promising areas for further research, to demonstrate the originality of the interpretation of the findings in the context of existing scientific knowledge. The method of economic analysis was employed to identify patterns and trends in the development of wholesale food turnover in Ukraine. It helped to analyse the competitive environment in the wholesale trade, the availability of employees and non-current assets of wholesale enterprises. The following key indicators were used to assess the wholesale turnover: total wholesale turnover; chain coefficient of goods distribution. The percentage of wholesale and warehouse turnover to retail turnover, the level of centralised delivery of goods by suppliers and at their expense.

The indicator of wholesale trade turnover in the context of the country and its regions was compiled by the main groups and types of goods defined by the State Statistics Service of Ukraine (Official website of the State Statistics of Ukraine, n.d.). Using the regression analysis method, the study determined the impact on the wholesale turnover of food products at the macro level of such factors as the number of operating food businesses, retail turnover, the value of non-current assets of operating businesses, and the number of employees. The regression analysis was performed using built-in Microsoft Excel functions. The significance of the linear regression models was assessed using the Fisher's test. The level of correlation between the factors under study was determined using the Chaddock scale, which is presented below (Table 1).

Table 1. Chaddock scale

Closeness value of the connection indicator in absolute terms	0.1-0.3	0.3-0.5	0.5-0.7	0.7-0.9	0.9-0.99
Communication characteristics	Weak	Moderate	Noticeable	High	Very high

Source: developed by the authors of this study based on the Chaddock Scale (n.d.)

To estimate the average percentage change in the resultant attribute (Y) with a 1% change in the factor attribute (X), the elasticity coefficient calculated using formula 1 was used:

$$E = f'(x) \cdot \frac{\bar{x}}{\bar{y}}, \quad (1)$$

where E is the elasticity coefficient; X is the factor attribute; Y is the outcome attribute.

Using the coefficient of determination (R^2), the study assessed the extent to which the developed regression models were adequate to describe the real data. The closer R^2 is to 1, the more confident the model is in making predictions. The method of logical generalisation was employed to formulate conclusions and proposals, which helped to explain the reasons for the decline in the wholesale turnover of food products in Ukraine, identify the key factors of its increase, and formulate management decisions on optimising the wholesale turnover.

RESULTS AND DISCUSSION

The elevated level of wholesale turnover demonstrates the efficient operation of the company, its ability to meet customer needs and compete in the market. Wholesale trade is a valuable element of commodity circulation, as it ensures the efficient distribution of goods between producers and retailers. The results of the analysis of the dynamics of wholesale trade turnover in Ukraine showed that the turnover of wholesale trade enterprises in 2010-2021 increased from UAH 993.7 billion to UAH 3,153.2 billion, i.e., more than 3 times, due to inflationary processes in the economy (Table 2).

Table 2. Dynamics of wholesale turnover in Ukraine

Year	Wholesale turnover, UAH billion			Share of food products in the wholesale turnover, %	Share of sales of food products produced in Ukraine, %
	Wholesale trade enterprises – legal entities	food products	non-food products		
2010	993.7	193.8	799.8	19.5	75.1
2011	1,107.3	194.5	912.8	17.6	75.5
2012	1,093.3	215.2	878.1	19.7	73.7
2013	1,074.8	199.7	875.1	18.6	71.7
2014	988.0	194.7	793.3	19.7	71.4
2015	1,244.2	224.3	1,020.0	18.0	75.2
2016	1,556.0	252.8	1,303.2	16.2	76.4
2017	1,908.7	314.0	1,594.7	16.5	76.8
2018	2,215.4	356.1	1,859.3	16.1	77.2
2019	2,322.2	392.1	1,930.1	16.9	75.1

Table 2, Continued

Year	Wholesale turnover, UAH billion			Share of food products in the wholesale turnover, %	Share of sales of food products produced in Ukraine, %
	Wholesale trade enterprises – legal entities	food products	non-food product		
2020	2,462.6	437.6	2,025.0	17.8	72.6
2021	3,153.2	490.6	2,662.6	15.6	71.6
2022	2,768.3	*n/a	n/a	n/a	n/a

Note: *n/a – no information available

Source: developed by the authors of this study based on data from the Official website of the State Statistics of Ukraine (2024), the Official website of the State Statistics of Ukraine (2021b), and the Official website of the State Statistics of Ukraine (2021a)

In 2022, due to negative factors caused by martial law, this indicator decreased by 13.9% compared to the previous year. In 2021, the share of food products in wholesale turnover also decreased by 2.2%, which was the result of a change in the ratio of growth rates of food and non-food product groups. Domestic products prevailed in the structure of food products sold in the wholesale trade during the study period, but in 2021 there was a 1% decrease in their share compared to the previous year. Due to the lack of information on the wholesale turnover of food and non-food products in 2022, no assessment of this market segment was made, but considering the major destruction and suspension of many businesses as a result of hostilities, an increase in the share of imported goods in the Ukrainian market can be predicted. An analysis of the dynamics of the physical volume of turnover of wholesale trade enterprises in 2010-2022 suggests considerable fluctuations during the study period, as presented in Table 3.

Table 3. Indices of the physical volume of wholesale turnover of wholesale trade enterprises in Ukraine (in comparable prices) by the previous year, %

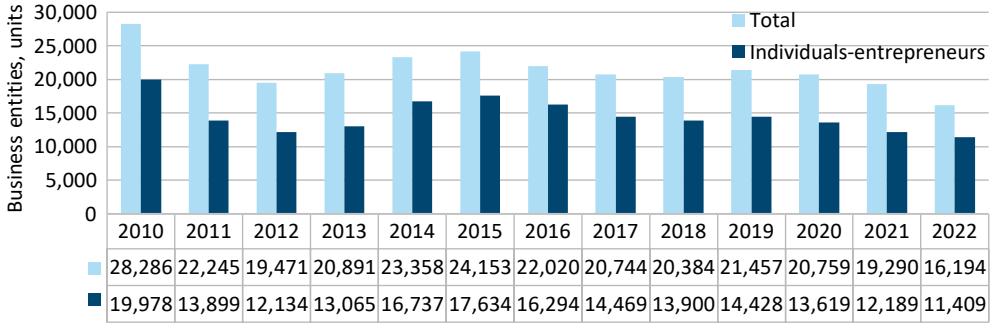
Year	Physical volume index		
	wholesale turnover	wholesale turnover of food products	wholesale turnover of non-food products
2010	100.0	100.0	100.0
2011	100.7	99.4	100.8
2012	96.9	110.6	96.7
2013	97.4	92.8	99.6
2014	82.1	97.5	92.4
2015	87.8	115.2	120.3
2016	104.7	112.7	136.5
2017	102.8	124.2	122.4
2018	103.6	113.4	116.6
2019	99.5	110.1	103.8
2020	104.2	111.6	104.9
2021	94.4	112.1	131.5
2022	64.1	n/a	n/a

Source: developed by the authors of this study based on data from the Official website of the State Statistics Service of Ukraine (2024)

The lowest growth rate for this indicator was recorded in 2017 (+2.8%), while the highest – in 2016 (+4.7%). In 2022, there was a considerable decline in the index of physical volume of wholesale trade turnover of wholesale trade enterprises (-30.3%), which was the result of the impact of the war on the Ukrainian economy, including trade. Having analysed the dynamics of the physical volume of wholesale turnover of food and non-food product groups, the

largest growth of this indicator was found in 2017 (+24.2%) in the food group and in 2016 (+36.5%) in the non-food group. The minimum growth in the physical volume of wholesale turnover of these product groups was observed in 2019, with the food group growing by +10.1% and the non-food group – by +3.8%. Differences in the dynamics of the indices of the physical volume of wholesale turnover of food and non-food products can be caused by a series of factors, both economic and social. The indices may be affected by different elasticities of demand, its seasonality, political events, epidemics or pandemics, changes in climate conditions, structural changes in the economy, inflation and deflation, and government regulation.

Factors influencing the wholesale turnover of food products are divided into external and internal. External environmental factors include the state of the economy, competition, legislation, seasonality, and socio-cultural factors. Internal factors include the range and quality of goods, pricing policy, delivery terms, marketing and advertising, customer service, financial stability, provision of non-current assets, management efficiency, etc. Competition is a powerful driver of food market development. It forces businesses to constantly improve and adapt to new conditions. To operate successfully in a competitive environment, it is necessary to develop effective strategies, invest in development and be ready for change (Chikov, 2019). The competitive environment in food wholesale is complex and dynamic. The modern Ukrainian wholesale market is represented by a wide range of trade intermediaries, which differ in scale, organisational structure, functional responsibilities, and specialisation. According to the State Statistics Service of Ukraine (Official website of the State Statistics of Ukraine, 2023a), 16,194 business entities were involved in the wholesale trade in food products in 2022, of which 70.5% were individual entrepreneurs (IEs). According to the study, the number of companies engaged in the wholesale trade in food products almost halved between 2010 and 2022. The full-scale war and occupation of the territories were the main reason for the 19.1% decline in the number of business entities in this sector in 2022, but the number of individual entrepreneurs decreased by only 6.8% (Fig. 1).



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Total	28,286	22,245	19,471	20,891	23,358	24,153	22,020	20,744	20,384	21,457	20,759	19,290	16,194
Individuals-entrepreneurs	19,978	13,899	12,134	13,065	16,737	17,634	16,294	14,469	13,900	14,428	13,619	12,189	11,409

Figure 1. Number of operating business entities in the wholesale trade of food products, units
Source: developed by the authors of this study based on data from the Official website of the State Statistics Service of Ukraine (2023a)

As presented in Figure 1, legal entities have certain advantages in terms of scale and access to resources, but individual entrepreneurs are more resilient in a crisis due to their flexibility, adaptability, and lower financial liabilities. Sole proprietorships, unlike large companies, have a smaller bureaucratic structure, which allows them to respond quickly to market changes, promptly change the range of goods, prices, sales channels, and other business parameters. Remote technologies allowed them to continue their operations despite martial law, and by cutting staff and rental costs, they managed to adapt to the new economic reality. However, the predominance of individual entrepreneurs in the wholesale food trade negatively affects the

quality of customer service and the overall functioning of the market. To ensure a stable supply of goods and meet the needs of producers and retailers, it is necessary to consolidate wholesale structures and create a more civilised consumer market.

The data on the number of employees at wholesale enterprises indicate the need for government intervention in regulating this sector, as staffing is a key factor contributing to its development and the competitiveness of enterprises in the market. The analysis of the dynamics of the number of employees in the food wholesale trade in Ukraine over the period from 2010 to 2022 showed a steady downward trend in their number. During this period, the number of employees in the sector decreased by 56.7%. The largest job losses were observed in 2022, amounting to 29.4% compared to the previous year (Fig. 2). A prominent indicator that characterises the activities of food wholesale enterprises is the number of employees per enterprise (Fig. 3).

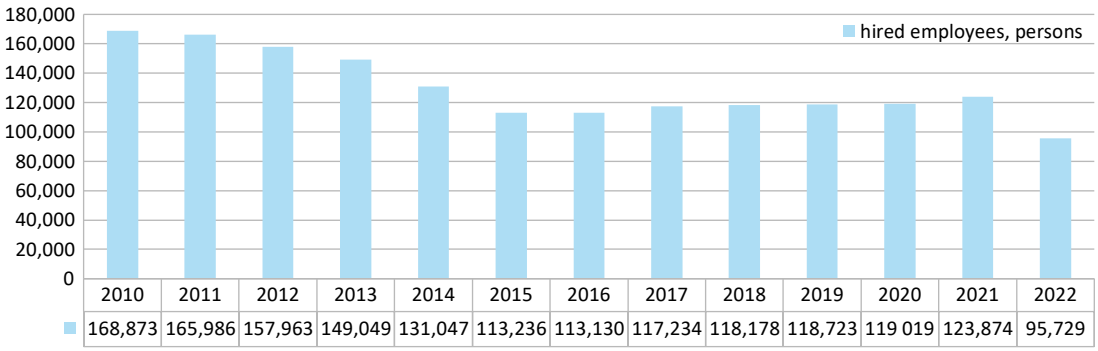


Figure 2. Dynamics of the number of employees in the food wholesale trade in Ukraine, persons
Source: developed by the authors of this study based on data from the Official website of the State Statistics Service of Ukraine (2023a)

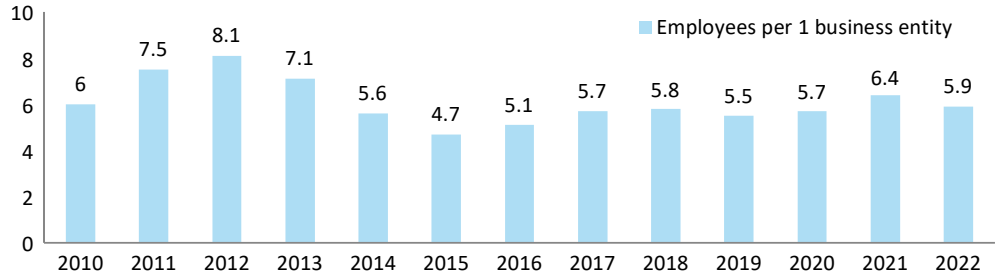


Figure 3. Dynamics of the number of employees per 1 business entity in the wholesale food trade in Ukraine, persons
Source: developed by the authors of this study based on data from the Official website of the State Statistics Service of Ukraine (2023a)

A direct correlation was found between the number of employees and the size of the enterprise. The analysis of the data shows a negative trend in the number of employees in the food wholesale trade per wholesale trade entity since 2014, which is explained by the predominance of individual entrepreneurs in the structure of operating business entities, as well as the outbreak of armed aggression, the presence of annexed territories and the slowdown in the development of the industry in this regard. Specifically, in 2014, the analysed indicator decreased to 5.6 persons per business entity from 7.1 persons in 2013, i.e., by 26.8%.

The competitiveness of business entities in the wholesale food trade and their ability to meet consumer needs is also determined by the condition, efficiency of use, and compliance with current requirements of existing non-current assets. According to the State Statistics Service of Ukraine, non-current assets of food wholesalers include investment property, long-term biological assets, capital investments in progress, and long-term financial investments. The majority of non-current assets of wholesale trade enterprises are fixed assets (Non-current assets..., n.d.).

In 2022, the share of fixed assets in the non-current assets of food wholesalers was 77.4%, while in 2013 it was 62.9%. Depreciation of fixed assets as of the end of 2022 was lower than in other sectors of the economy and amounted to 43.4%. As of the end of 2022, the value of non-current assets of food wholesale companies increased by 1.8 times compared to 2013 and amounted to UAH 2,447.8 thousand per business entity, which can be explained by a considerable reduction in the number of legal entities in this sector and an uneven distribution of investments (Fig. 4).

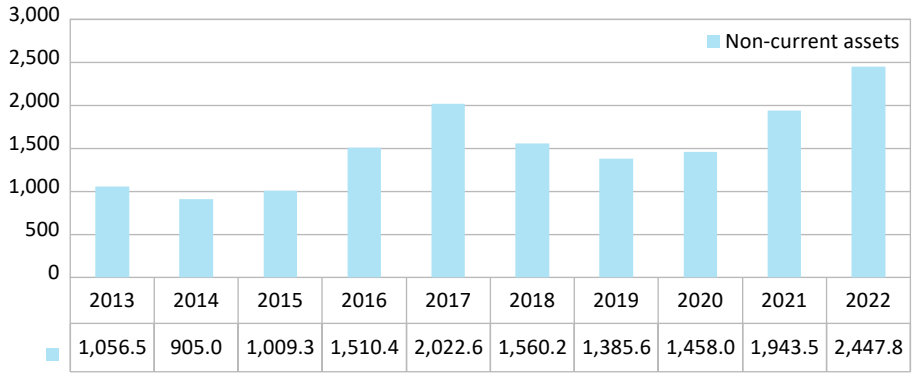


Figure 4. Dynamics of non-current assets per 1 business entity in the wholesale food trade in Ukraine, UAH thsd

Source: developed by the authors of this study based on data from non-current assets of enterprises by type of economic activity with distribution into large, medium, small, and micro enterprises in 2013-2023 (n.d.)

As presented in Figure 4, the competitive environment in the wholesale trade sector is distorted by regional disparities, as some regions have a much more developed wholesale trade network than others. This situation can lead to a series of negative consequences for the economy as a whole and for individual regions specifically. For instance, according to the State Statistics Service of Ukraine, the city of Kyiv, as well as Kyiv and Odesa regions accounted for the largest share of the wholesale food turnover in 2017-2021 (State Statistics Service of Ukraine, 2023). Regional disparities were caused by geographical, economic, and social factors. Specifically, Odesa Oblast is a region with access to the sea, while the city of Kyiv and Kyiv Oblast have conventionally been the economic centres of Ukraine, which considerably affects the development of wholesale trade in this region. It is important to understand that addressing regional disparities is a long-term process that requires a comprehensive approach and coordination of efforts between various government agencies and businesses. To develop proposals for increasing the wholesale turnover of food products in Ukraine, the factors that influence the volume of wholesale turnover of food products were identified based on the regression analysis.

Having built a regression dependence of the wholesale turnover of food products on the number of operating business entities in this area, it was found that it is inverse, i.e., an increase in the number of business entities does not lead to an increase in wholesale turnover (Fig. 5).

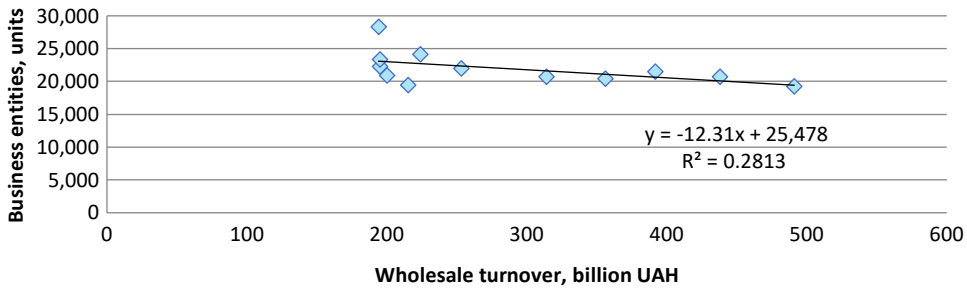


Figure 5. Regression dependence of the wholesale turnover of food products on the number of operating business entities in the wholesale trade of food products in Ukraine

Source: developed by the authors of this study

The linear regression equation is as follows:

$$y = -12.31x + 25{,}478. \quad (2)$$

The relationship is inverse, meaning that an increase in wholesale turnover by UAH 1 billion leads to a reduction in the number of business entities by 12.31 units.

According to Fisher's criterion, the equation is statistically significant because the tabulated F value of 4.9646 is higher than the factual F value of 3.9149. The level of the relationship between the studied attributes is noticeable (according to the Chaddock scale), since the independent variable R = 0.5304. It is indicated that, according to the coefficient of determination ($R^2 = 0.2813$), the variation of Y is 28.13% due to the variation of X. Additionally, the elasticity coefficient (3) shows how much the average change in the resultant attribute (Y) will change if the factor attribute (X) changes by 1%:

$$E = -12.31 \cdot \frac{288.9167}{21{,}921.5} = 0.1622\,.$$

Thus, a 1% increase in the wholesale turnover of food products leads to a 16.22% decrease in the number of business entities relative to the average values in the sample.

Having built a regression dependence of wholesale turnover on retail turnover in Ukraine, it was found that an increase in retail turnover by UAH 1 billion leads to an increase in wholesale turnover by UAH 97.8 million (Fig. 6).

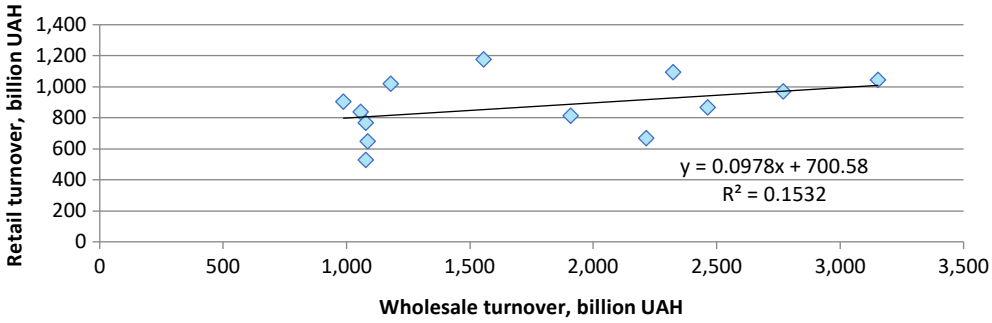


Figure 6. Regression dependence of wholesale turnover on retail turnover in Ukraine

Source: developed by the authors of this study based on data from the Official website of the State Statistics Service of Ukraine (2023)

The following linear regression equation was obtained:

$$y = 0.0978x + 700.58.$$

According to Fisher's criterion, the equation is statistically significant, as the tabulated F value of 4.8443 is higher than the factual F value of 1.9963. The level of density of the relationship between the studied attributes is moderate (according to the Chaddock scale) since the independent variable R = 0.3919. The coefficient of determination (R^2 = 0.1532) suggests that the variation in Y is 15.3% due to the variation in X. Additionally, the elasticity coefficient (5) showed how much the average change in the resultant attribute (Y) would be if the factor attribute (X) changed by 1%.

$$E = 0.0978 \cdot \frac{1,757.7692}{872.3846} = 0.1970.$$

Thus, a 1% increase in wholesale turnover leads to a 19.7% increase in retail turnover relative to the sample average.

Having built a regression dependence of the wholesale turnover of food products on the value of non-current assets of operating business entities in the wholesale trade of food products, it was found that an increase in the value of non-current assets by UAH 1 million would lead to an increase in wholesale turnover by UAH 39.3 billion (Fig. 7).

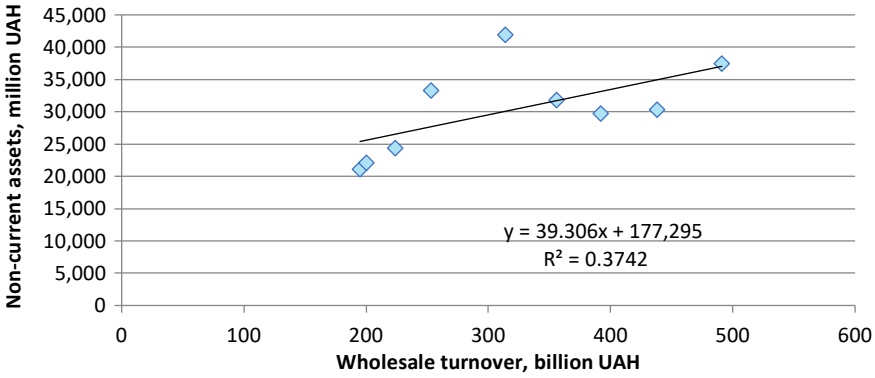


Figure 7. Regression dependence (linear trend line) of the wholesale turnover of food products on the value of non-current assets of operating business entities in the wholesale trade of food products in Ukraine

Source: calculated by the authors of this study

The equation is statistically significant because the tabulated F value of 5.5914 is higher than the factual F value of 4.177. The level of the relationship between the studied attributes is moderate (according to the Chaddock scale) since the independent variable R = 0.3737. Additionally, the elasticity coefficient (6), determined according to the linear trend line, shows how much the average change in the resultant attribute (Y) will change if the factor attribute (X) changes by 1%.

$$E = 39.306 \cdot \frac{318.2}{30,232.89} = 0.4137.$$

Thus, a 1% increase in wholesale trade turnover would require a 41.3% increase in the value of non-current assets of operating food wholesale businesses relative to the average values in the sample. To determine the regression dependence of wholesale food turnover on the number of employees in the wholesale food trade in Ukraine, a polynomial trend line was used, the model of which has the highest level of reliability compared to the analysed trend lines (Fig. 8).

It is calculated that the variation of Y is 55.6% due to the variation of X according to the value of the coefficient of determination (R^2 = 0.5563). The level of correlation between the studied attributes is high (according to the Chaddock scale) since the independent variable R = 0.7484. Additionally, the elasticity coefficient determined

according to the linear trend line (7) shows how much the average change in the resultant attribute (Y) will change if the factor attribute (X) changes by 1%:

$$E = 115.69 \frac{289}{133{,}026} = 0.2513.$$

A linear trend line was used for this purpose (Fig. 9).

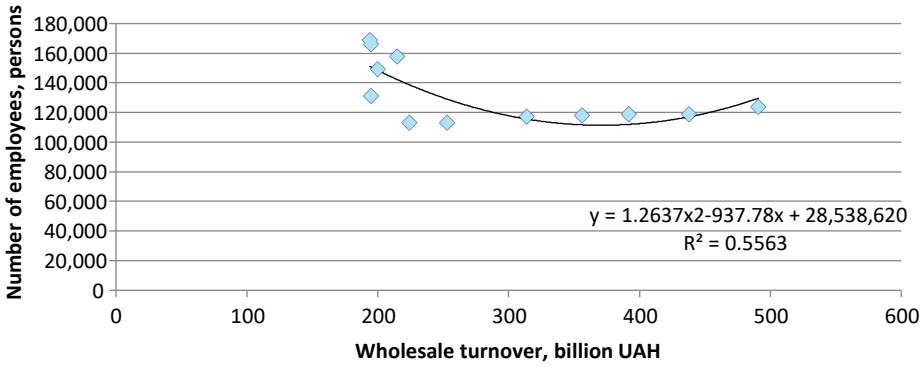


Figure 8. Regression dependence (polynomial trend line) of wholesale food turnover on the number of employees in the wholesale food trade in Ukraine

Source: created by the authors of this study

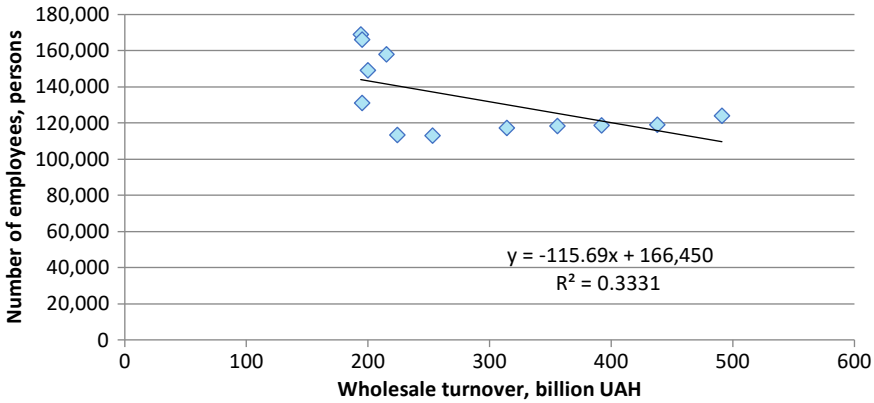


Figure 9. Regression dependence (linear trend line) of wholesale food turnover on the number of employees in the wholesale food trade in Ukraine

Source: developed by the authors of this study

Thus, according to Figure 9, a 1% increase in wholesale turnover would lead to a 25.1% reduction in the number of employees relative to the sample average. The regression analysis revealed that the following factors have the greatest impact on the volume of wholesale trade turnover: retail trade turnover of food products, as a 1% increase in wholesale trade turnover leads to its growth by 19.7%; value of non-current assets, as a 1% increase in wholesale trade turnover requires a 41.3% increase in their value, which requires considerable investments from business entities.

A 1% increase in wholesale trade turnover causes the following phenomena: a 25.1% reduction in the number of employees; a 16.22% reduction in the number of business entities in the food wholesale sector. The key factors explaining the trend towards a reduction in the number of employees as a result of an increase

in wholesale food turnover include automation and mechanisation of trade processes, optimisation of logistics and the growing popularity of online trading, as well as market concentration and increased workload on existing staff. Since the fastest way to reduce labour costs is to reduce staff or increase the workload per employee, this method is often used by businesses in times of economic crisis. The study found that the decrease in the number of business entities in the field of wholesale trade in food products with an increase in turnover is due to the influence of such factors as market concentration and the emergence of large players; technological changes and automation; changes in consumer preferences; economic factors leading to bankruptcy of small business entities.

It was found that strengthening the state influence on the wholesale food market and implementing effective management decisions at enterprises in this sector are key factors in the growth of wholesale turnover. Considering the significance of wholesale trade to the economy, the state should implement regulatory measures that include stimulating the development of logistics and infrastructure through comprehensive renovation of warehouses to improve storage quality and extend product shelf life; restoring and expanding the road network to ensure fast and safe delivery of goods to consumers; developing rail and river transport to improve the efficiency of long-distance cargo transportation; introducing state support for Ukrainian producers by reducing tax burden, simplifying customs procedures, expanding bank lending, implementing state programmes to modernise food production and new technologies to improve food quality; maintaining protectionist measures against imports to protect Ukrainian producers from unfair competition; stimulating the development of e-commerce; improving the quality of food production through the introduction of certification according to international standards to increase confidence in them.

Systems such as food safety management (ISO 22000:2018, 2018) and other food safety systems, such as BRC – British Retail Consortium Global Standards (Food safety, n.d.), can confirm compliance with international standards. Among the factors that can affect the effectiveness of management decisions at wholesale enterprises, it is worth noting cooperation with retail chains, namely, research and deep understanding of the needs of retail chains; optimising the range and terms of supply; building long-term relationships; implementing innovative solutions for inventory management, order processing, and data analysis; and systematically analysing the effectiveness of cooperation.

To achieve the desired results, the following marketing strategies should be implemented: creating strong brands to win the market and build customer loyalty; intensification of advertising campaigns in traditional and digital media; regular monitoring of changes in the structure of the population, consumer preferences, and migration flows; expansion of the range of products to meet the needs of different groups of people; building an efficient logistics system (situation assessment, planning, cooperation with other companies and government agencies to create a joint logistics network of centres and warehouses), and allocation of responsibilities and resources; the use of modern technologies (GPS navigation systems and drones to deliver small loads to hard-to-reach places; software for route optimisation and inventory management), as well as the use of security measures for employees and vehicles. It was emphasised that an equally significant factor is the creation of cooperatives and associations, which will allow small and medium-sized enterprises to pool resources to reduce costs and increase their competitiveness.

The study identified the key factors affecting the volume of wholesale food turnover, which is critical for ensuring the country's food security. Using economic analysis, the study revealed regularities and trends in the development of wholesale food turnover, while the method of regression analysis highlighted the factors that influence this indicator and helped develop recommendations for its management. I. Lobachova (2020) also emphasised the significance of managing the turnover of wholesale trade enterprises based on economic analysis. Investigating economic analysis as a prerequisite for developing a strategy for managing the turnover of an enterprise, the researcher noted that the management system at a trade enterprise

should be built considering the purpose, tasks, and principles of management.

The findings of the study confirm the conclusions drawn by other researchers regarding the significance of wholesale trade for the quality satisfaction of consumer needs. According to M. Bagorka *et al.* (2021), for the effective functioning of modern Ukrainian wholesale trade enterprises and the economy as a whole, it is necessary to apply a fundamentally new approach to solving economic problems based on modern principles, concepts, and marketing tools, so that wholesale trade becomes a lever to stimulate the development of domestic production, increase its efficiency, and better meet consumer needs.

It is indicated that the value of non-current assets available to business entities considerably affects the volume of wholesale turnover of food products. O. Bassova & K. Kogan (2020) also substantiated the need to form elements of market infrastructure for the development of wholesale trade and noted a critical shortage of warehouse and retail space for business entities in this area. It was found that an increase in wholesale turnover leads to a reduction in the number of employees in the wholesale food trade and the number of business entities in this area. K. Pugachevska *et al.* (2021) considered structural changes in internal trade to be an essential vector for improving the efficiency of the national economy. To improve the state regulation of internal trade, P. Kutsyk *et al.* (2024) propose to introduce a state policy of modernisation of the internal trade system, factoring in a set of basic elements such as mechanisms, instruments, objects of regulation, tasks, and functions. M. Deich *et al.* (2023) propose to improve the efficiency of wholesale trade in Ukraine by improving state legislation, while the objects of such regulation should be the processes taking place in the consumer market.

T. Fedotova *et al.* (2024) identify the main factors contributing to the development of food trade as economic growth of the region; volume of demand; interaction of supply and demand; national and regional governments; and indirect factors. The factors that ensure the turnover of food products include pricing policy; market conditions; market infrastructure; supply and demand for food products, institutional support, budgetary constraints of consumers and factors of cyclical and economic growth.

The proposals of this study to improve the efficiency of management at the level of individual wholesale enterprises are in line with the opinions of other researchers. T. Perederii (2024) proposed to introduce crisis management to increase the sustainability and competitiveness of trade enterprises in a crisis provoked by war. O. Prodius *et al.* (2024), in studying the strategic vectors of improving the efficiency of a trading enterprise under martial law, described the development of a strategy for improving the efficiency of a wholesale trade company at enterprises to ensure their sustainable development. M. Ilchuk & L. Pankratova (2020) noted that the development of wholesale trade is influenced by shadow schemes that distort its real volumes, especially in the agricultural sector, where trade in grain and oilseeds without proper registration is widespread.

It was decided that to comprehensively address the above problems, it is necessary to introduce transparent management mechanisms, which include detailed accounting of agricultural land and effective taxation, and the introduction of yield monitoring systems. Elimination of the practice of falsifying agricultural production data, switch to electronic trading platforms, and introduction of transfer pricing for holding companies. Thus, it was confirmed that the findings of the present study complement the existing scientific knowledge base on food wholesale trade and provide valuable information for improving the efficiency of management in this area.

CONCLUSIONS

The analysis of the dynamics of wholesale trade turnover in Ukraine for 2010-2022 showed a steady upward trend. Inflationary processes substantially affect this indicator, while the war led to a considerable decline in trade turnover and changes in its structure. There was a slight decline in the share of Ukrainian food products in total wholesale sales. The dynamics of the physical volume of wholesale turnover in Ukraine in 2010-2022 was characterised by pronounced fluctuations.

According to the physical volume indices, the largest growth was observed in 2016, while the largest decline was observed in 2022. The current Ukrainian food wholesale market is characterised by the prevalence of individual entrepreneurs, which allowed it to maintain a certain resilience during the war. However, to further develop and ensure the stability of the supply of goods, it is necessary to move towards market consolidation and the creation of larger wholesale structures. An analysis of the dynamics of the number of employees in the food wholesale trade over 2010-2022 showed a rapid reduction in jobs, especially in 2022. This suggests the need for government support for the industry, as staff shortages can adversely affect the efficiency of wholesale companies and the stability of supply to the market. The predominance of individual entrepreneurs in the food wholesale market is one of the reasons for the reduction in the number of employees per enterprise.

The fixed assets of food wholesalers are characterised by lower depreciation compared to other sectors of the economy. However, an increase in the value of non-current assets per business entity indicates an uneven distribution of investments. Geographical location, economic development, and historical factors contribute to regional disparities in food wholesale trade. The concentration of wholesale turnover in certain regions, such as the city of Kyiv, as well as Kyiv and Odesa regions, is a consequence of these reasons and requires a systemic solution. To increase the volume of food wholesale trade in Ukraine, it is necessary to intensify state regulation of this industry and introduce modern management methods at wholesale trade enterprises. Prospects for further research are to identify other factors influencing the wholesale food turnover in Ukraine, such as the volume of production in the country and the world, population migration, etc.

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CONFLICT OF INTEREST

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Оптовий товарообіг продовольчих товарів в Україні: оцінка та прийняття управлінських рішень

Анотація. Зниження оптового товарообігу продовольства в Україні через окупацію родючих земель на Півдні та Сході, руйнування агропідприємств, логістичні проблеми, масову еміграцію населення стало серйозною проблемою, яка не лише загрожує дефіцитом продуктів та зростанням цін, але й становить загрозу харчовій безпеці населення. Тому дослідження причин та наслідків цього явища є надзвичайно актуальними. Метою наукової роботи було виявлення факторів, що обумовлюють динаміку оптового товарообігу продовольчих товарів в Україні, з подальшим формулюванням пропозицій щодо підвищення ефективності

діяльності оптових підприємств на основі прийняття управлінських рішень. Дослідження базувалося на комплексному використанні таких методів, як збір та аналіз емпіричних даних, бібліографічний аналіз наукової літератури, економіко-статистичні методи, включаючи регресійний аналіз, а також метод логічного узагальнення для систематизації отриманих результатів та формулювання висновків. В результаті дослідження виявлено основні чинники, що впливають на обсяг оптового товарообігу продовольчих товарів, та які є критичними для забезпечення продовольчої безпеки країни. Економічний аналіз дозволив ідентифікувати закономірності та тенденції в динаміці товарообігу, а регресійний – кількісно оцінити вплив виявлених факторів та розробити рекомендації щодо управління цим процесом. Запропоновано активізувати державне регулювання, спрямоване на створення сприятливих умов для розвитку оптової торгівлі, в поєднанні з модернізацією управлінських процесів на рівні оптових підприємств. Виявлено, що інноваційні підходи до співпраці з роздрібними мережами, такі як глибокий аналіз їхніх потреб, оптимізація асортименту, побудова довгострокових відносин та впровадження сучасних технологій, є важливими чинниками, що впливають на ефективність управління оптовими підприємствами. Для забезпечення їх стабільного розвитку в майбутньому необхідно застосовувати ефективні маркетингові стратегії. Отримані в ході дослідження результати мають високу практичну значимість для суб'єктів господарювання, що здійснюють оптову торгівлю продовольчими товарами, оскільки вони дозволяють прийняти ефективні управлінські рішення щодо збільшення обсягів оптового товарообігу

Ключові слова: гуртова торгівля; продукти; маркетингові стратегії; інноваційні підходи; конкурентоспроможність

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Milk production trends in Ukraine

Abstract. During 2015-2023, the dairy industry faced challenges that led to a decrease in the number of cows, a decline in production, a decline in its competitiveness, and an imbalance between supply and demand in the internal market. Considering the political and economic situation, it was necessary to solve the problems of dairy production, provide the country's population with high-quality dairy products, and increase their exports to global markets. The study was conducted using abstract and logical, statistical, and tabular methods to collect, process, and analyse information on milk production, cow numbers and their productivity, feed consumption, and the formation of market offers. The graphical method was employed to investigate the share of milk production, the distribution of self-sufficiency, the dynamics of livestock keeping, and the average annual milk yield. The study analysed milk production and examined the share of production in the structure of gross agricultural output in 2015-2023. The study analysed the balance of production and consumption, examined the distribution of Ukrainian regions by the level of milk self-sufficiency, formed a rating of regions by production per capita in 2021. The study analysed and grouped enterprises by livestock, developed a map of the number of cows in farms in 2023, and considered

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the average annual milk yield in 2015-2023. The study found that to improve the situation in milk production, it is necessary to comprehensively consider state support that will help increase production and create suitable economic and legal conditions for the gradual transformation of enterprises into family farms or dairy cooperatives. The article identified the main problems of milk production in Ukrainian farms, developed ways to address them, and highlighted the practical value of an integrated approach to measures that will improve the quality and competitiveness of dairy products in the domestic and foreign markets

Keywords: consumption; livestock; productivity; households; enterprise; self-sufficiency

INTRODUCTION

The dairy market plays a significant role in Ukraine's food industry, providing the human diet with animal products such as milk, cheese, yoghurt, kefir, sour cream, butter, sour milk, etc. By supplying the human body with essential nutritional and biologically active substances that are a source of animal protein, the dairy farming industry has become an integral part of the economic structure, which has made it possible to analyse and investigate its development trends, promote exports, provide jobs, and stimulate the development of agricultural cooperative complexes. The study of trends in the dairy industry, such as the introduction of innovative technologies, improvement of the quality of dairy products, and reduction of their environmental impact considerably affect the country's overall economic situation and its integration into the global market.

According to V. Antoshchenkova & Yu. Kravchenko (2022), consumers are increasingly seeking to include dairy products in their daily diet to improve their health with high-quality and healthy natural products. According to the FAO (Food and Agriculture Organisation of the United Station, n.d.), global milk production was estimated at 930 million tonnes in 2022, and in 2023 it grew by 1.4%. The slowdown in milk production growth was driven by a 39% increase in feed prices compared to 2022, higher prices for fertilisers, fuel, and electricity, adverse weather conditions that reduced yields, international climate protection initiatives, and a reduction in the carbon footprint of farms (Kukhaleishvili, 2023). As of 2023, Ukraine was ranked 32nd in the global milk production ranking with 7.36 million tonnes (Official website of the State Statistics of Ukraine, 2023). Ukraine has a favourable geographical location, rich natural resources and production potential, and opportunities for the development of dairy farming. However, in 2015-2023, the industry experienced negative trends in the reduction of livestock, a decrease in milk production, increased imports, rising prices and, accordingly, an increase in the cost of dairy production (Gladiy & Prosovich, 2022). L. Donets *et al*. (2024) believe that negative trends also include a decrease in the share of dairy exports, a low technological level of milk production at enterprises, and insufficiently established cooperation between households (the main milk producers) and dairy processing enterprises. Changes in consumer preferences, a decline in consumer solvency, the pandemic, climate and demographic changes, the introduction of martial law, and active hostilities were also factors. Consumer interest in plant-based animal milk substitutes grew in 2015-2023. It was necessary to constantly prove to consumers the benefits of milk consumption, provide reliable information about the dangers of alternative products, and fight unfair competition and falsified dairy products (Antoshchenkova & Kravchenko, 2022).

Considering that on 13 December 2023, the European Council decided to negotiate Ukraine's accession to the EU, and in 2024 Ukraine is working with the EU on the process of full integration of all its institutions into European standards, milk producers must modernise their production following European standards, such as Codex Alimentarius Commission (2024). Such as the EU Regulation developed under the auspices of FAO (Regulations of the European Parliament of the EU and of the Council No. 2019/1700 On a Common Framework for European Statistics on Persons and Households Based on Individual-Level Data Collected From

Samples, 2019), Order of the Ministry of Health of Ukraine dated No. 1145 "On Approval of the Requirements for Claims About the Nutritional Value of Food Products and Claims About the Health Benefits of Food Products", 2020), and the WHO Institute of Nutrition (Order of the Ministry of Health No. 1613 "On Approval of the Rules for Adding Vitamins, Minerals and Some Other Substances to Food Products", 2020). According to the Hazard Analysis and Critical Control Point (HACCP, 2023), DSTU ISO 22000:2019 (2019) and Food safety management systems (2020) standards, by modernising dairy production to EU standards, enterprises will be able to maintain the competitiveness of the Ukrainian dairy industry and open new markets. I. Tsvigun & F. Tsvigun (2023) noted that the main problems of dairy farming recovery are related to the growth of the number of animals, but it is also necessary to consider the economic indicators of milk production, prices and quality of dairy products, the volume of milk exports and imports, and the solvency of the country's population. According to L. Donets *et al*. (2024), it is important to stabilise and improve the situation on the milk market by using a combination of measures based on economic, legal, and government support.

M. Gladiy & O. Prosovich (2022) found that an increase in state support and funding for the dairy industry can become a driving force for development, concluding that only with close contact, interaction, and consideration of the interests of all actors – producers, processors, and the state, development of a strategy, implementation of an effective mechanism for its implementation, it is possible to ensure sustainable growth of the dairy industry in the long term. The purpose of this study was to analyse trends in milk production and to find out the reasons for the negative trends in dairy farming. The objective of this study was to propose measures and determine the prospects for production in Ukrainian farms, considering the real conditions and practices of developed countries, to provide the internal market with the necessary volume, quality, and growth of its exports.

MATERIALS AND METHODS

The information and analytical framework of the study was based on statistical materials of the State Statistics Service of Ukraine (Official website of the State Statistics of Ukraine, n.d.) and FAO for 2015-2023, as well as the results of research by international organisations. The main sce of information is the section "Livestock Production, Number of Livestock and Feed Supply" and the statistical yearbook "Balances and Consumption of Basic Foodstuffs by the Population of Ukraine" on the website of the State Statistics Service of Ukraine (Official website of the State Statistics of Ukraine, 2023), which contains information on milk production, cow productivity, feed use, consumption of basic foodstuffs and balance of dairy products. The theoretical basis of this study was taken from the studies of Ukrainian and foreign researchers who have investigated the problems and challenges of the dairy industry. The recommendations of the WHO Institute of Nutrition of Ukraine (Order of the Ministry of Health No. 1613 "On Approval of the Rules for Adding Vitamins, Minerals and Some Other Substances to Food Products", 2020) were used to study the consumption of dairy products.

The National Programme for the Development of Dairy Farming and Processing Enterprises of Ukraine until 2030 was a strategic legal document at the national level. The general scientific methods of research included the method of analysis, based on which the research algorithm was built; the method of comparison, which helped to compare the principal indicators of the dairy industry development; abstract and logical method for generalising trends in the development of the dairy industry, forming prospects for its development, and drawing conclusions. Several special methods were employed in the study, namely: the method of economic analysis and ranking to identify the key factors that affect the efficiency of milk production; the econometric method of testing data in the Excel software package to confirm the existence of quantitative relationships between identifying trends in the development of dairy cattle breeding indicators; tabular and graphical methods to improve the analytical perception of data statistics and draw correct conclusions about milk production, cow numbers and productivity, feed consumption, milk supply, distribution of self-sufficiency, dynamics of cow keeping on farms, and average annual milk yield.

The principal standards in the Codex Alimentarius Commission study were "Standard for fermented milk products" (CXS 243-2003, 2003), "Standard for the naming of milk fats" (CXS 211-1999, 1999), "Standard for milk fat spreads" (CXS 253-206, 2006), "General Standard for Cheese" (CXS 283-1978, 1978), Order of the Ministry of Health "On Approval of the Requirements for Claims About the Nutritional Value of Food Products and Claims About the Health Benefits of Food Products" (Order of the Ministry of Health No. 1145 "On Approval of the Requirements for Claims About the Nutritional Value of Food Products and Claims About the Health Benefits of Food Products", 2020), "Food Safety Management Systems" (DSTU ISO 22000-2019, 2019). "Requirements for organisations in the food production chain" (Food safety management systems, 2020), and the Law of Ukraine "On Basic Principles and Requirements for the Safety and Quality of Food Products" (Law of Ukraine No. 3221-IX "On Basic Principles and Requirements for the Safety and Quality of Food Products", 2023).

The share of milk production in total agricultural production was calculated using Equation 1:

$$V = \frac{QxP}{GP}, \quad (1)$$

where P is the share of milk production in total agricultural production, %; Q is the production quantity, tonnes; P is the price, UAH; GP is gross agricultural production, UAH.

Factual consumption of dairy products was calculated based on Equation 2:

$$FCd = Q + I - E - CL, \quad (2)$$

where FCd is the factual consumption of dairy products, kg; Q is the production quantity, tonnes; I is the imports, tonnes; E is the exports, tonnes; CL is the feed costs and consumer losses.

The level of self-sufficiency was calculated using Equation 3:

$$SL = \frac{FICm + FC + L}{Q}, \quad (3)$$

where SL is the self-sufficiency level, kg; $FICm$ is the fund for internal milk consumption, kg; FC is the feed costs, tonnes; L is losses, tonnes; Q is milk production volume.

The concentration of livestock per farm was calculated using Equation 4:

$$C = \frac{Ni}{\sum Vi, i<1<n}, \quad (4)$$

where Ni is the number of livestock of the i-group, heads; i is the group by number of cows, number; n is the number of groups.

The calculation of the number of cows and their number by farms was based on the average number of cows in the farms of the regions of Ukraine. The degree of influence of the factor characteristics on the result was analysed using Microsoft Excel software. The sample was formed based on data from 24 regions of Ukraine. The data does not include the temporarily occupied territory of the Autonomous Republic of Crimea, the city of Sevastopol, and part of the temporarily occupied territories of Donetsk and Luhansk regions.

RESULTS AND DISCUSSION

The dairy industry is one of the leading sectors in Ukraine's food industry. In 2023, the share of milk production in total agricultural production (in gross output prices of 2021) was 29.9%, and in the structure of gross livestock production – 5.6% (Fig. 1).

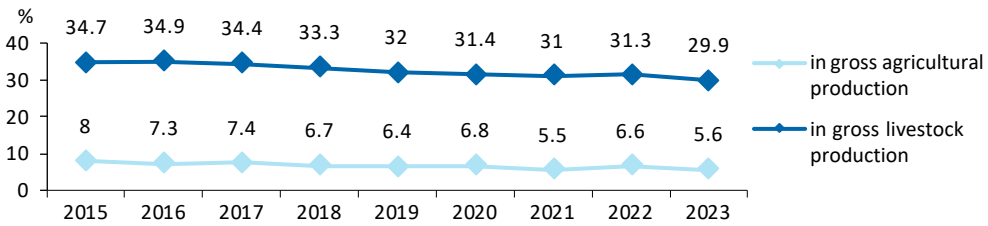


Figure 1. Share of milk production in total agricultural production (share in the overall structure of livestock production)

Source: calculated by the authors of this study according to the Official website of the State Statistics of Ukraine (2023)

According to the study, it was found that compared to 2015, it decreased by 3.4% and 1.4%. This negatively affected the milk market, consumption, sales, and exports. The development of the dairy industry is influenced by the state of the production base, consumer solvency, market infrastructure, etc. In 2019-2023, the effects of the COVID-19 pandemic, martial law and, as a result, a decline in milk production were added to the factors (Kozak & Hryshchenko, 2022). Countries around the world have different attitudes towards milk consumption and production. For example, in China, which is the largest importer, consumption is 260 ml per person per year (Ukraine: Milk Production, 2020). This is conditioned by the fact that the Chinese tradition of consuming dairy products is still being formed, and there is a shortage of dairy products on the market, which is why China is dependent on imports of dairy products. The Ministry of Health of New Zealand suggests consuming dairy products at least twice a day, giving preference to low-fat dairy products, including "alternative" milk (rice, coconut, and soy) in the diet. It is recommended to consume 1 glass of milk (250 ml), 1 package of yoghurt (125-150 g), 2 slices of cheese (40 g) and 1 glass of soy milk (250 ml) per day. The daily milk consumption rate (in terms of raw milk) in New Zealand is 108.88 kg/person, in Canada – 76.18 kg/person, Australia – 99.14 kg/person, the USA – 64.05 kg/person, and in India the consumption rate is 58.70 kg/person, according to 2020 data (Ukraine: Milk Production, 2020).

The WHO recommends consuming 330 kg of milk and dairy products per person per year (How much dairy products should be consumed, 2022). According to the recommendations of the Institute of Nutrition, the WHO recommends a daily intake of 3-4 glasses of milk per day for a child, or it can be replaced with kefir, yoghurt, hard and cottage cheese, because at a young age the body needs to be saturated with calcium, the consumption of which affects bone density. An adult's daily intake of dairy products is 2 glasses of milk, kefir, ryazhanka (baked milk) or 500 g of cottage cheese, and it is recommended that elderly people consume up to 3 glasses of fermented milk products such as yoghurt and kefir per day. In the United States, the Department of Agriculture recommends consuming three servings of dairy products per day (one serving is a glass of liquid milk or yoghurt or 40 g of hard cheese). The Ministry of Health of Ukraine recommends consuming one glass of milk (250 ml), one serving of yoghurt (200 ml), 40 g of hard cheese, and 120 g of cottage cheese (How much dairy products should be consumed, 2022). The rational, scientifically sound annual consumption rate of milk and dairy products per person in Ukraine is 350-380 kg per year. Studies have shown that the consumption of dairy products in Ukraine decreased by 1.08 times in 2015-2021 (from 8,995 thsd tonnes in 2015 to 8,337 thsd tonnes in 2021). Analysing the production and consumption of milk and dairy products per capita in Ukraine, its decrease can be observed. The study showed that in 2015-2023, milk production per capita decreased by 24 kg, while consumption in 2015-2021 decreased by 8.4 kg and amounted to 201.5 kg (Table 1).

Table 1. Dynamics of production and consumption of milk and dairy products per capita, kg

Year	Production		Consumption	
	kg	to the previous year	kg	to the previous year
2015	248	–	209.9	–
2016	243	98.0	209.5	99.8
2017	242	99.6	200.0	95.5
2018	238	98.4	197.7	98.9
2019	230	96.6	200.5	101.4
2020	222	96.5	201.9	100.7
2021	211	95.1	201.5	99.8
2022	222	105.2	–	–
2023	224	100.9	–	–
Consumption norm	–	–	380.0	–

Source: calculated by the authors of this study according to the Official website of the State Statistics of Ukraine (2023)

In 2021, the per capita consumption of dairy products in Ukraine was 26.27% of the physiological norm of 380 kg of the Ministry of Health. Compared to WHO standards (330 kg), this is 30.25%. The decline in milk consumption per capita is caused by a decrease in milk production, which in all categories of farms decreased by 30% or 1.4 times from 10.6 million tonnes to 7.4 million tonnes in 2015-2023 (Table 2).

Table 2. Milk production in Ukraine, 2015-2022

Indicator	Year							2023 in % to	
	2015	2016	2019	2020	2021	2022	2023	2015	2022
thsd. t	10,615	10,064	9,663	9,264	8,714	7,768	7,430	70.0	95.7
%	100	100	100	100	100	100	100		
Agricultural enterprises:									
thsd. t	2,669	2,756	2,729	2,761	2,768	2,621	2,810	105.3	107.2
%	25.1	27.4	28.2	29.8	31.8	33.8	37.8		
Household farms:									
thsd. t	7,946	7,309	6,935	6,502	5,946	5,147	4,621	58.1	89.8
%	74.9	72.6	71.8	70.2	68.2	66.2	62.2		
Milk production in all categories of farms:									
Milk production per capita, kg	247.8	238.1	229.9	221.9	210.6	221.9	223.8	101.1	95.7

Source: calculated by the authors of this study according to the Official website of the State Statistics of Ukraine (2023)

At the same time, production in agricultural enterprises increased by 5.3% or 141 thsd tonnes, while households saw a faster decline in milk production – by 41.9% or 3,325 thsd tonnes. With the outbreak of hostilities in 2022, milk production in all categories of farms decreased by 10.9% compared to 2021, due to a 20% decrease in milk production in households and a 10% decrease in agricultural enterprises. It was found that a considerable share of milk production (66.2%) is accounted for by household farms, while agricultural enterprises account for 33.8%. According to statistics from 2015-2022, the functioning of the dairy market under comparable production and marketing conditions shows serious structural problems and requires urgent reforms to ensure stability and efficiency. In the long term, it is the development of dairy farming through large, specialised enterprises that can produce quality milk, improve technological conditions, attract investment in the construction of new farms and improve existing ones. According to official data, in 2022, almost a third of milk production in Ukraine was provided by agricultural enterprises, while in 2015 it was only 25% (Official website of the State Statistics of Ukraine, 2023).

Even though agricultural enterprises reduced their milk production in 2015-2022, their share in total production began to shift upwards, from 25.1% to 33.8%, due to improved conditions for keeping cows and milk yield. In 2022, the company produced 5,147 thsd tonnes of the product, which is 20% less than in 2021. It is highlighted that a large share of production in households in Ukraine (66.26%) is not due to an increase in production but is the result of a decrease in production in the public sector (Kozak & Hryshchenko, 2022). Gradually, the bulk of milk production in Ukraine is shifting towards large enterprises. Household farms are characterised by labour market shortages and production costs. Due to the lack of mechanisation of production, small livestock sizes (mainly 1-2 cows), insufficient feed supply, and low development of breeding. Farms cannot guarantee the proper quality of milk due to the inability to ensure proper sanitary and hygienic standards of its production or in the absence of primary processing (cooling), and therefore they continue to actively get rid of cows, which affects the decline in milk production in the country (Shpychak, 2021). It was found that a decrease in

the share of households in the milk market will lead to an increase in product quality and prices. An analysis of the balance of production and consumption of dairy products in all categories of Ukrainian farms showed that its volumes decreased (Table 3).

Table 3. Balance of milk and dairy products in all categories of Ukrainian farms, thsd tonnes

Indicators	Year						
	2015	2016	2017	2018	2019	2020	2021
Production	10,615	10,382	10,281	10,064	9,663	9,264	8,714
Changes in inventory	-41	28	33	74	-1	171	-26
Import	78	105	132	180	337	691	781
Total resources	10,734	10,459	10,380	10,170	10,001	9,784	9,521
Export	464	434	835	807	593	440	369
Spent on feed	1,097	1,069	1,036	996	969	904	805
Losses	15	14	13	12	11	10	10
Consumption fund	8,995	8,942	8,496	8,355	8,428	8,430	8,337
per 1 person, kg	209.9	209.5	200	197.7	200.5	201.9	201.5
Level of self-sufficiency	105.0	103.6	107.7	107.5	102.7	99.1	95.2
Market capacity	10,220	10,053	9,578	9,437	9,407	9,515	9,126
Degree of market openness, %	0.76	1.04	1.38	1.91	3.58	7.26	8.56

Source: calculated by the authors of this study according to the Official website of the State Statistics of Ukraine (2023)

It was found that milk production exceeds the consumption fund, but consumption itself does not meet the standards. In 2015-2021, milk consumption per capita ranged within 200-209 kg (Official website of the State Statistics Services of Ukraine, 2023). The loss of control over part of the country's territory as a result of hostilities, a decline in the purchasing power of the country's population, and a reduction in the size of the market have all contributed to a reduction in the capacity of the internal dairy market. In 2021, the share of milk produced in Ukraine that was used for domestic consumption in the dairy sector was 9.2%, and 95.7% for household consumption. In 2021, the market capacity was 9,126 thsd tonnes, down 10.8% compared to 2015 due to a decrease in production and exports (by 17.9% and 20.5%, respectively).

In 2015-2021, imports increased 10-fold to 9% of commodity production, or 2.3 times higher than exports. The degree of openness of the dairy market increased from 0.76% in 2015 to 8.56% in 2021 due to increased imports of products and a decrease in market capacity, which shows Ukraine's import dependence on other countries. However, the level of self-sufficiency in milk and dairy products in 2021 was 95.2%. The highest self-sufficiency rates in 2015 and 2021 were in Poltava, Khmelnytskyi, Chernihiv, and Vinnytsia regions, while the lowest were in Kyiv, Luhansk, Dnipro, and Donetsk regions (Fig. 2). At the same time, in 2021, Ternopil region met the demand for dairy products by 174%, Zakarpattia region – by 94%, Zaporizhzhia region – by 57%, Lviv region – by 71%, Odesa region – by 65%, Kharkiv region – by 76%, Cherkasy region – by 151%, Sumy region – by 164%. Insufficient coverage of milk and dairy products consumption is related to household incomes, rising prices for milk and dairy products, and production volumes of milk and dairy products. The largest volumes of milk production per capita in 2015-2021 were also observed on dairy farms in Khmelnytskyi, Poltava, Chernihiv, Vinnytsia, Ternopil, Zhytomyr, and Cherkasy regions (Table 4).

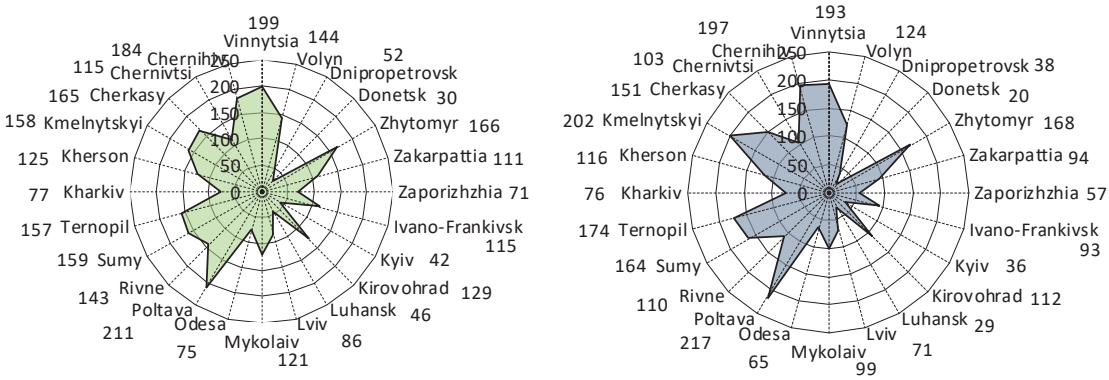


Figure 2. Distribution of Ukrainian regions by level of milk self-sufficiency

Source: calculated by the authors of this study according to the Official website of the State Statistics of Ukraine (2023)

Table 4. Milk production per capita, kg

Regions of Ukraine	2015	2016	2017	2018	2019	2020	2017	2021 to 2015, %
	248	243	242	238	230	222	211	85.0
Vinnytsia	522	535	538	526	492	475	452	86.5
Volyn	408	396	396	377	357	344	330	80.9
Dnipropetrovsk	106	99	93	91	89	87	79	74.8
Donetsk	53	45	45	45	42	38	35	66.4
Zhytomyr	462	456	443	451	426	421	411	88.9
Zakarpattia	284	255	258	275	279	269	250	88.1
Zaporizhzhia	148	149	151	142	130	121	109	73.8
Ivano-Frankivsk	343	338	336	321	313	301	290	84.5
Kyiv	96	94	93	92	84	81	78	80.5
Kirovohrad	318	317	318	324	320	294	296	93.0
Luhansk	72	56	57	59	53	52	48	67.4
Lviv	225	214	209	201	191	184	171	75.9
Mykolaiv	296	296	299	286	266	250	223	75.4
Odesa	161	152	146	141	135	130	124	76.7
Poltava	550	556	558	542	544	532	507	92.2
Rivne	376	376	373	343	310	293	247	65.7
Sumy	373	374	378	377	369	364	340	90.9
Ternopil	431	427	428	429	437	452	451	104.6
Kharkiv	193	195	194	196	195	178	163	84.9
Kherson	282	280	279	273	274	260	235	83.5
Khmelnytskyi	448	457	466	492	505	522	529	118.0
Cherkasy	425	420	414	399	390	389	373	87.7
Chernivtsi	323	316	310	302	288	276	264	81.7
Chernihiv	526	529	535	530	511	464	456	86.7

Source: calculated by the authors of this study according to the Official website of the State Statistics of Ukraine (2023)

According to Table 4, the lowest volumes in 2015-2021 were observed in dairy farms in Donetsk, Luhansk, Kyiv, Dnipro, Zaporizhzhia, Odesa, and Kharkiv regions. In terms of regions, it was found that the largest milk producers in 2022 were Khmelnytskyi (673 thsd tonnes

or 8.7% of the total milk produced in Ukraine), Poltava (663 thsd tonnes or 8.5%) and Vinnytsia (631 thsd tonnes or 8.1%) regions.

At the same time, due to the full-scale invasion of Russia, Ukraine's dairy industry did not receive 1 million tonnes of raw milk in 2022, and the volume of milk produced was 10.9% less than in 2021. Among the regions, the lowest milk production volumes in 2022 were in Lviv (388 thsd tonnes), Ivano-Frankivsk (370 thsd tonnes), Volyn (324 thsd tonnes), Zakarpattia (298 thsd tonnes), Odesa (287 thsd tonnes), Kirovohrad (273 thsd tonnes), Chernivtsi (227 thsd tonnes), Mykolaiv (197 thsd tonnes), Zaporizhzhia (106 thsd tonnes), and Kherson (65 thsd tonnes). The highest level of decrease in milk production during 2015-2021 was observed in Donetsk region – by 36.7%, Luhansk region – by 35.7%, and during 2021-2022 in Zaporizhzhia region – by 41.1%, Kharkiv region – by 50.4%, Donetsk region – by 57.4%, Kherson region – by 72.5%, due to anti-terrorist operations and military operations (Official website of the State Statistics Services of Ukraine, 2023).

In 2015-2021, milk production in the region decreased by 19.5%, while consumption of milk and dairy products decreased by 4.8%, which led to structural shifts in production and supply to the market. In 2015, the supply of milk for processing was 8,492 thsd tonnes and 2,123 thsd tonnes for on-farm consumption, and in 2021, respectively, 6,971.2 thsd tonnes and 1,742.8 thsd tonnes. In 2015, including milk imports, the supply of milk was 10,734 thsd tonnes, while production was 10,615 thsd tonnes (Fig. 3), meaning that supply exceeded production. In 2021, it was 9,521 and 8,714 thsd tonnes, respectively.

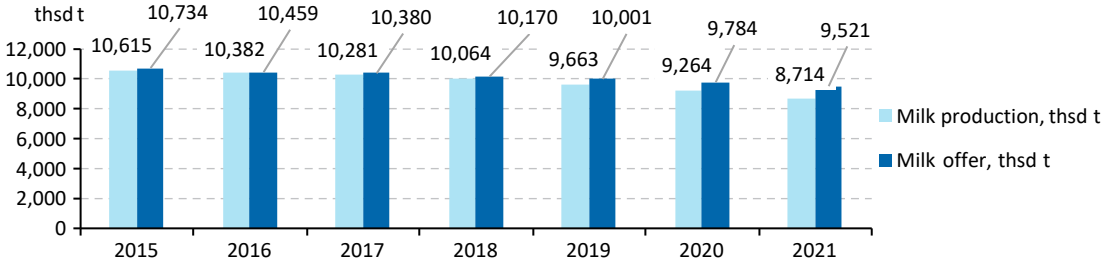


Figure 3. Supply of milk by Ukrainian farms

Source: calculated by the authors of this study according to the Official website of the State Statistics of Ukraine (2023)

The decline in raw milk production by all categories of farms was caused by a reduction in the number of cows, despite an increase in cow productivity (Table 5).

Table 5. Number of cows by farm category in Ukraine (beginning of the year), thsd heads

Indicator	Year							2023 in % to	
	2015	2018	2019	2020	2021	2022	2023	2015	2022
Number of cows in all categories of farms	2,262.7	2,017.8	1,919.4	1,788.5	1,673.0	1,544.0	1,352.8	59.8	87.6
%	100	100	100	100	100	100	100	x	x
including:									
in agricultural enterprises	529.2	466.6	467.8	438.6	423.9	424.6	394.2	74.5	92.8
%	23.4	23.1	24.4	24.5	25.3	27.5	29.1	x	x
in household farms	1,733.5	1,551.2	1,451.6	1,349.6	1,249.1	1,119.4	958.6	55.3	85.6
%	76.6	76.8	75.6	75.5	74.7	72.5	70.9	x	x

Source: calculated by the authors of this study according to the Official website of the State Statistics of Ukraine (2023)

The study found that the vast majority of cows are concentrated in households. Thus, in 2022, the number of cows in Ukraine was 1,352.8 thsd heads, of which 394.2 thsd heads, or 29.14%, were kept in agricultural enterprises, and 958.6 thsd heads, or 70.9% – in household farms. Many economic experts do not understand this correlation, as Ukraine has a developed food sector that can provide the country's population with food, form an active position in international agri-food markets, and dairy business in Ukraine is a profitable enterprise. This is facilitated by the availability of land, low rents, the absence of milk quotas (restrictions) and, compared to other countries, a relatively lenient taxation system, and the availability of feed, as all types of feed are produced in the country (The agricultural sector of Ukraine..., 2024).

In 2015-2023, the number of cows decreased by 909.9 thsd heads, or 1.67 times, including 135 thsd heads, or 1.3 times, in agricultural enterprises, and 774.9 thsd heads, or 1.81 times, in household farms. In 2023, compared to 2022, the number of cows decreased by 12.38% across all categories of farms, mainly due to 14.36% decrease in households. The number of companies specialising in milk production in Ukraine decreased from 2,614 to 1,309, or by 1,305 companies, in 2015-2023. There is also a change in the concentration of milk production. Thus, while in 2015 there were 64 enterprises with more than 1,000 cows, in 2023 there were only 73 enterprises (Fig. 4).

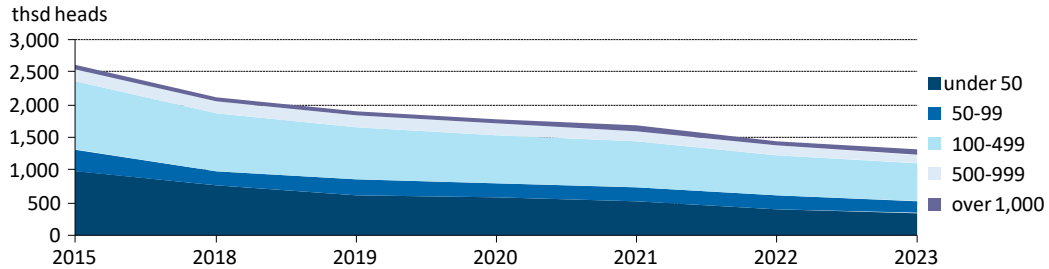


Figure 4. Number of cows on farms, heads

Source: created by the authors of this study based on the Official website of the State Statistics of Ukraine (2023)

A grouping of enterprises by number of cows showed that in 2023, farms with up to 50 cows accounted for 26.51%, 50-90 cows – 13.67%, 100-499 cows – 44.16%, 500-999 cows – 9.78%, and over 1,000 cows – 5.58%. In 2015-2022, the bulk of animals were concentrated in farms with 100-499 heads (Fig. 4), while the largest number of animals was over 1,000 heads (Kozak, 2018). There has been a gradual increase in the number of enterprises with over 1,000 heads. During 2010-2022, 43 farms with over 1,000 cows were opened in Ukraine (Global challenge: Why milk production..., 2023). There is a distinction between large milk producers with over 3,000 cows using modern scientific and technological advances and small milk producers, households with 1-2 cows and a much lower level of organisation and technical equipment.

The international market is witnessing a process of dairy farm consolidation, as small businesses are struggling with rising production costs. According to the IFCN results, the share of enterprises with over 1,000 heads has been growing in recent years. Large farms are more resilient to challenges and are attractive to investors. This trend is typical even for EU countries (with mostly small and medium-sized farms), which in 2022 increased the number of cows with more than 100 cows by 1.8% compared to 2021, although the total number of farms decreased by 3.5% in 2022 compared to 2021, mainly due to small farms leaving the dairy industry. IFC (World Bank Group) experts note that a sustainable model for Ukraine is a dairy industry with farm sizes of 2,000 heads and an annual production of 9 tonnes of milk per cow (Global challenge: Why milk production..., 2023). During the study period, the average herd size in agricultural enterprises increased from 193 heads in 2015 to 274 heads in

2022, or by 41.97% or 1.4 times. Scientists have proven that an increase in the number of cows in a herd increases the efficiency and competitiveness of production.

Meanwhile, in 2015-2021, herd reproduction rates deteriorated in all categories of farms, as the number of calves per 100 cows decreased, with the number of calves decreasing from 71 to 67. Moreover, this trend is also observed in the regional context, with the highest calf crop in 2021 in Volyn (73 heads), Ternopil (72 heads), Kharkiv (72 heads), Chernihiv (71 heads), Kyiv (70 heads), Poltava (70 heads), and the lowest – in Zakarpattia (46 heads), Ivano-Frankivsk (55 heads), Chernivtsi (60 heads), and Sumy (60 heads) regions. According to the State Statistics Service of Ukraine, as of 1 January 2023, there were 1,353 thsd cows in all categories of farms (Official website of the State Statistics Services of Ukraine, 2023). The leaders in terms of the number of cows in 2023 were Khmelnytskyi, Vinnytsia, and Poltava regions (Fig. 5).

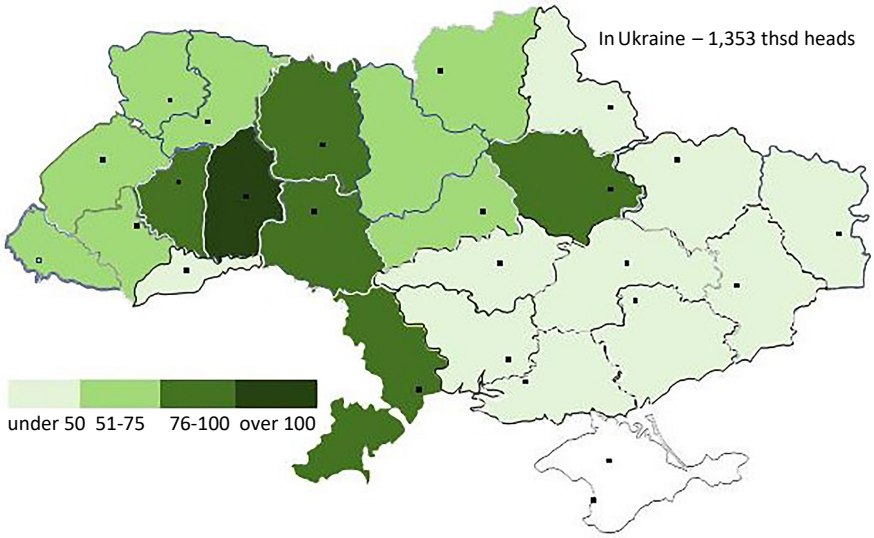


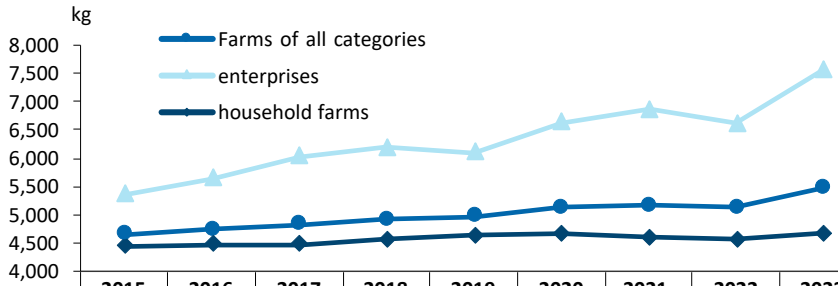
Figure 5. Number of cows in farms of all categories as of 1 January 2023, thsd heads

Source: calculated by the authors of this study according to the Official website of the State Statistics of Ukraine (2023)

A small number of livestock is concentrated in Luhansk, Donetsk, Dnipro, Zaporizhzhia, Kherson, Mykolaiv, and Sumy regions. Studies show that there is a direct correlation in the regions between the decline in milk production and the decline in the number of cows. Thus, in Kyiv, Vinnytsia, Ivano-Frankivsk, and Dnipro regions, the number of cows in 2022 was less than 30.0-35.3% of the 2015 level. At the same time, in the Zakarpattia, Ternopil, Khmelnytskyi, Chernivtsi, Poltava, and Odesa regions, the number of cows decreased to only 13.8-20.9% during the study period, due to an increase in the number of cows in households. The study revealed a downward trend in the number of cows due to the loss of interest in keeping cows by all categories of farms due to the lack of an effective programme to stimulate the development of the dairy industry, climate change, annual increases in the cost of feed, fuel, and lubricants and electricity, an imperfect mechanism for subsidising producers and insufficient government support for dairy farming, a reduction in/receipt of calf crop, cow fatness, poor housing conditions, low head count and market conditions.

From 2021 to 2022, the frontline regions lost cattle – some stayed in the occupied territories without accounting and supervision, while some producers managed to rescue and transport livestock to central and western regions of Ukraine, where the security situation was

better than in the south and east (The number of cows on farms decreased to 387,000, 2023). In the context of the economic crisis and war, producers do not risk investing in increasing livestock, facing a shortage of staff, increased logistics costs, and deteriorating feeding conditions (Global challenge: Why milk production..., 2023). Ukraine's dairy sector has lost 50,000 cows, 100 dairy farms, a large part of the territory is under Russian occupation, and there is a lack of working capital, credit, and government subsidies. The cost of milk production is rising, and prices are rising. The number of cattle in Ukraine is expected to decline as a result of the negative effects of the war, increased slaughter volumes, and live exports. Calculations of the study's statistics confirmed that the decline in milk production is connected with cow productivity, which is twice as low in Ukraine as in developed countries (Fig. 6).



	2015	2016	2017	2018	2019	2020	2021	2022	2023
Farms of all categories	4,644	4,735	4,820	4,922	4,976	5,129	5,155	5,119	5,476
enterprises	5,352	5,643	6,025	6,190	6,101	6,634	6,863	6,611	7,568
household farms	4,437	4,473	4,480	4,559	4,630	4,666	4,604	4,569	4,664

Figure 6. Average annual milk yield per cow in all categories of farms in Ukraine

Source: calculated by the authors of this study according to the Official website of the State Statistics of Ukraine (2023)

Despite a 30% decrease in milk production in Ukraine in 2015-2023 and a 40.2% decrease in the number of cows, the annual increase in their productivity from 4,644 kg to 5,476 kg is observed due to the purchase of high-yielding cows. Notably, milk yields in agricultural enterprises are growing faster than in households, which is caused by the use of more advanced technological means of production. Thus, in 2015, cow productivity at agricultural enterprises was 5,352 kg of milk, in 2019 it was over 6,101 kg of milk, in 2021 it was 6,863 kg, and in 2022, due to military operations, milk yields decreased to 6,611 kg per cow, i.e., 3%, while in 2023 it was 7,568 kg.

According to the State Statistics Service of Ukraine, at the beginning of February 2022, the average annual milk yield per cow in all categories of farms was 5,119 kg. The leaders in cow productivity were Kyiv (6,970 kg), Cherkasy (6,615 kg), Poltava (6,306 kg), and Vinnytsia (5,892 kg) regions. The lowest productivity was observed in Odesa (3,312 kg), Zakarpattia (3,474 kg), and Dnipro (3,770 kg) regions. It was clarified that developed countries have moved away from the concept of increasing the number of cows and are directing their resources to increasing milk yields while reducing the number of cows due to improved breeding, technological progress, cow housing conditions and improved diets (Kozak & Hryshchenko, 2022). The concentration of significant milk production in households (66% in 2022) does not allow for high-quality products. The supply of milk to dairy processing plants reaches only 17.3% of the total production process. The milk produced in households meets the requirements of the highest (in 2022, 3.9%) and first (in 2022, 77.1%) grades, while the milk produced in agricultural enterprises meets the requirements of extra (in 2022, 42.7%), highest (in 2022, 32.6%), and first (in 2022, 19.3%) grades (Official website of the State Statistics of Ukraine, 2023).

The study confirmed that milk quality is an important factor in the competitiveness of enterprises in the dairy market, and that the quality of milk is ensured by using the genetic potential of cows, a suitable level of veterinary care, the use of modern housing technologies, high-tech milking parlours, refrigeration equipment, and the provision of nutritious feed. O. Shpychak (2021) noted that the problem of milk quality can be solved by restructuring milk production by increasing the number of cows in households from 1-3 heads to 15 heads, which will help to eliminate anonymisation, create mini-farms, and ensure proper milk quality and combine the producer and the seller in one process – the main stage of improving milk quality by creating mini-farms. The experience of the effective existence of this type of farm with a number of cows (15-40 heads) is widespread in countries around the world, as the formation of small enterprises is not a strategic area of the organisational structure of market-type agriculture. The same opinion is shared by the scientists of the National Research Centre of the Institute of Agrarian Economics, who note that households cannot be the basis of the dairy industry, the revival and development of the country (Kozak, 2018). Age-related factors, increased costs of material and technical resources, migration, and inaccessible loans predict a further decline in the number of households. It is predicted that EU requirements for milk quality or a ban on the sale of milk produced by households will accelerate this process (Kozak, 2018). Among the factors that influence the increase in cow productivity, the most important is properly organised feeding of animals and their quality. Feed consumption of all types per head of cattle increased in all categories of farms from 3,078 kg feed units in 2015 to 3,135 kg feed units in 2021, while the cost of producing 100 kg of milk did not change in 2015-2021 and amounted to 96 kg feed units (Table 6).

Table 6. Feed costs per 100 kg of milk production in enterprises

	Feeds of all kinds					Of which concentrated				
	2010	**2015**	**2020**	**2021**	**2022**	**2010**	**2015**	**2020**	**2021**	**2022**
Ukraine	**1.18**	**1.00**	**0.84**	**0.86**	**0.86**	**0.37**	**0.41**	**0.46**	**0.47**	**0.48**
Vinnytsia	1.16	0.95	0.81	0.92	0.81	0.35	0.37	0.47	0.55	0.49
Volyn	1.28	1.26	0.88	0.88	0.83	0.27	0.41	0.44	0.47	0.46
Dnipropetrovsk	1.05	0.92	0.93	0.87	0.90	0.36	0.39	0.55	0.48	0.52
Donetsk	1.10	0.85	1.03	1.30	1.27	0.41	0.43	0.67	0.59	0.56
Zhytomyr	1.78	1.24	1.00	1.04	0.94	0.46	0.44	0.46	0.54	0.49
Zakarpattia	1.03	1.25	0.90	1.31	1.66	0.26	0.41	0.39	0.63	0.80
Zaporizhzhia	1.18	1.05	0.82	0.87	0.92	0.43	0.42	0.44	0.46	0.42
Ivano-Frankivsk	1.20	1.13	1.14	1.19	1.14	0.26	0.33	0.63	0.61	0.66
Kyiv	1.02	0.95	0.76	0.84	0.85	0.37	0.41	0.41	0.43	0.45
Kirovohrad	1.18	0.83	0.86	0.73	0.74	0.39	0.33	0.52	0.45	0.45
Luhansk	1.00	1.05	0.94	0.91	...	0.36	0.37	0.43	0.42	...
Lviv	1.23	1.06	1.11	1.12	0.86	0.30	0.37	0.47	0.57	0.42
Mykolaiv	1.10	0.86	0.71	0.73	0.74	0.39	0.40	0.46	0.48	0.46
Odesa	1.18	1.16	0.99	0.86	0.96	0.39	0.42	0.53	0.39	0.43
Poltava	1.10	1.05	0.82	0.83	0.80	0.37	0.51	0.46	0.48	0.45
Rivne	1.15	0.97	0.86	0.94	0.85	0.22	0.39	0.45	0.41	0.43
Sumy	1.07	0.92	0.92	0.97	0.95	0.29	0.30	0.44	0.47	0.48
Ternopil	1.09	0.87	0.69	0.68	0.59	0.31	0.33	0.42	0.42	0.36
Kharkiv	0.98	1.02	0.85	0.87	0.82	0.35	0.44	0.47	0.49	0.40

Table 6, Continued

	Feeds of all kinds					Of which concentrated				
	2010	2015	2020	2021	2022	2010	2015	2020	2021	2022
Kherson	1.12	1.05	0.75	0.71	...	0.35	0.42	0.44	0.44	...
Khmelnytskyi	1.20	0.99	0.80	0.80	0.98	0.30	0.34	0.45	0.43	0.61
Cherkasy	1.08	0.96	0.83	0.87	0.78	0.36	0.39	0.48	0.51	0.45
Chernivtsi	1.16	1.00	1.08	0.91	0.76	0.42	0.46	0.60	0.61	0.48
Chernihiv	1.24	1.07	0.78	0.81	0.87	0.37	0.38	0.41	0.43	0.51

Source: calculated by the authors of this study according to the Official website of the State Statistics of Ukraine (2023)

Feed consumption per head of cattle increased in all farms from 2,646 kg/ha in 2015 to 2,870 kg/ha in 2021, while the cost of producing 100 kg of milk decreased from 100 to 86 kg/ha in 2015-2022, but concentrate feed increased from 41 to 48 kg/ha. In terms of regions, the highest feed consumption in 2022 was observed in Zakarpattia, Donetsk, Sumy, and Khmelnytskyi regions, while the lowest – in Ternopil, Mykolaiv, and Kirovohrad regions. Feed consumption per head of cattle decreased in households from 3,430 kg feed units in 2015 to 3,389 kg feed units in 2021, while the cost of producing 100 kg of milk increased from 95 to 101 kg feed units in 2015-2021. The conducted study shows that with an increase in feed consumption per cow from 3,426 to 6,530 kg per cow on average, including concentrated feed from 1,779 to 3,626 kg per year, milk yields increased 2.2 times, i.e., from 3,469 kg to 7,614 kg, while the average in Ukraine was 6,863 kg. Irrational use of feed leads to an increase in the cost of feed and a reduction in the profitability of raw material production.

It is important to keep in mind the comfort of the animal, because for 24 hours they should be in optimised conditions, without restrictions on natural activity during the day, with proper nutrition and rest. The growth of cow productivity depends on the genetic potential of the breeds. This principle was also followed by American researchers V. Cabrera & L. Fadul-Pacheco (2021), Ch. Hudson & R. Laven (2019), who showed that it is possible to increase the milk production of cows due to progress in genetics and management. Scientists have shown that the growth in milk production has been driven by fewer cows, reduced use of water, land, and other natural resources, while increased fat and protein content in milk due to genetic improvements (Genetics and sustainable milk production, 2022). However, using the best genetic potential in dairy farming requires constant investment, and it is the most profitable investment, as genetics costs do not exceed 3% of the annual cost of keeping a cow, but the effect can exceed 30%. Improved animal welfare and the ability to breed animals with better physiological characteristics meet the needs of milk producers and their consumers. The traits "Feed Saved" and "Residual Feed Intake" allow genetically selecting animals for feed conversion, which is a very real factor that helps to optimise feed efficiency and reduce feed costs, which increases the overall productivity and economic benefits of livestock production (Genetics and sustainable milk production, 2022). Feed conversions are a win-win for dairy producers who want to control costs and for consumers who want a sustainable dairy product. By harnessing the genetic ability and trait of animals to produce the same amount of milk on less food, fewer natural resources are used for feed production. This will reduce the environmental impact of dairy farms. From this position, the US dairy community has united around the idea of achieving carbon neutrality, optimising water use, and improving water quality by 2050, supporting global sustainability initiatives and consumer expectations (Genetics and sustainable milk production, 2022; Global challenge: Why milk production..., 2023).

The study showed that the national programme for the development of dairy farming and processing enterprises in Ukraine until 2030 should be based on state support, which includes state subsidies (return of the special

VAT regime); use of the Agrarian Fund for financial and commodity interventions; state subsidies to stimulate dairy exports; conducting state tender purchases of dairy products only from producers; formation of import quotas; combating product falsification (Dairy industry of Ukraine and its future in 10 years: problems, national development program and state support, 2020; Strategy for the development of the dairy industry of Ukraine until 2030, 2020). It is also necessary to change the tax and criminal codes, reduce VAT on all dairy products, abolish VAT on imported innovative equipment, adopt the Law on Trade and the draft Law on Packaging and Waste, and review the terms of foreign trade with the EU (Strategy for the development of the dairy industry of Ukraine until 2030, 2020). The findings of the study showed that a mechanism is needed to assess the effectiveness of the dairy farming development programme, the possibility of its gradual implementation, and the cohesion of all participants and the understanding that this cannot be achieved without government support.

According to the strategies for the development of the dairy industry until 2030 (Dairy industry of Ukraine and its future in 10 years: problems, national development programme and state support, 2020; Strategy for the development of the dairy industry of Ukraine until 2030, 2020), milk producers and processors must improve milk quality to international standards, introduce a milk quality control system and increase the range of dairy products. Dairy entrepreneurs should also approve: the production of competitive products through the use of modern technologies, the production of organic products, functional products (with increased protein content, gerontological products, etc.), and the production of dairy products for HoReCa, to improve export opportunities to increase the production of dairy products with a long shelf life. Modernise processing plants to improve energy efficiency and environmental standards; create training centres for dairy specialists, as the number of specialists is decreasing and there are no training centres in Ukraine. Protect the domestic market from counterfeiting, introduce quotas and tariffs on imports of dairy products, and impose customs tariffs if quotas are exceeded. Establish a transparent procedure for tender purchases, concluding milk purchase agreements and ensuring cooperation between dairy producers and processors.

The results of the study correlate with the findings of Ukrainian scientists O. Shpychak (2021), A. Shevchenko & N. Tabachuk (2019) and A. Chmut & N. Antosh (2018) in terms of the manifestation of crisis phenomena in dairy farming and in methodological approaches to studying milk production trends. In milk production by large farms or the transformation of households into family farms, which, with financial resources, can improve the quality of raw milk through modernisation and the use of scientific and technological advances, and government support. The negative trends were observed in the dairy industry in 2015-2023, the excess of milk consumption over production leads to the growing share of imported milk and dairy products in the Ukrainian market. In 2022, the share of milk imports increased by almost 5% compared to 2021 (Donets *et al*., 2024). The share of milk production in households was high in 2023 (62.19%), and therefore the problem of competitiveness is becoming acute, and its solution is gaining importance, as Ukraine's integration into world markets depends on it (Gurska & Lukyanova, 2019). Only agricultural enterprises (33.8%) can supply milk of adequate quality – large producers that use mechanical milking, milk cleaning, and cooling can invest in modernising milk production processes to improve product quality and respond to changes in commodity markets. Household farms have neither the conditions nor the capacity to ensure proper production processes, and violate sanitary and hygienic standards, which cause high bacterial contamination of milk (Kozak, 2018; Gurska & Lukyanova, 2019). The concentration of milk production in households is the reason for the low quality of dairy products (Shevchenko & Tabachuk, 2019).

During 2015-2023, there was an increase in the quality of milk supplied for processing from agricultural enterprises of extra and higher grades, while households supplied milk for processing of higher, I and II grades (Shevchenko & Tabachuk, 2019; Gurska & Lukyanova, 2019). An essential condition for Ukrainian enterprises

to enter the European market is to ensure that their quality level meets European standards. It is possible to solve the problems of high-quality milk production, and for this purpose, it is necessary to direct all economic and organisational efforts to restructure milk production, increasing the number of cows on the farm from 1-3 heads to 15-40 heads, which will help to create mini-farms, eliminate the depersonalisation of milk sales, and combine the producer and the seller of dairy products in one process (Shpychak, 2021). Researchers from the International Dairy Farm Comparison Network have proposed the following classification of farms: households (1 to 10 cows), family farms (11-100 cows), business farms (over 100 cows) (Kozak & Hryshchenko, 2022). In countries around the world, the category of "household" is not found, and family farms are transforming into business farms, while in developing countries, household farms play a leading role in milk production. In 2021, the share of farms with more than 10 cows in the world was 3%, which kept 37% of the dairy herd and produced 63% of milk, while only 213 thsd farms, or 0.2%, are business farms, but their share in milk production is 42%. The largest proportion of cows is kept on business farms in New Zealand (99.7%) and South Africa (99%), while in Ukraine this figure is 28% (Kozak & Hryshchenko, 2022).

At the same time, the quality of products directly depends on the quality of raw materials, which needs to be improved by uniting small-scale producers (households) into private farms. To simplify the procedure for transforming peasant households into farms, the Law of Ukraine "On Farming" allows the establishment of family-type farms without their registration as legal entities, or into cooperatives based on an integrated system of milk production and processing. Cooperatives are viable, where, apart from procurement on a cooperative basis, milk is processed and dairy products are sold, and the products produced are jointly owned by the producers of raw milk. The alignment of interests of all cooperative members ensures proper coordination of their activities in milk production and processing. Raw milk is produced, the use of which ensures the production of dairy products that are competitive both on the internal and external markets (Poperechnyi & Salamin, 2022). High-quality dairy products can be obtained through the use of high technology in milk production, and as Ukraine integrates into the EU, it must adopt international standards. Due to the joint efforts of the state, milk producers and processors, the Ukrainian dairy market can be a profitable business and a powerful exporter of dairy products to the EU and global markets (Shevchenko & Tabachuk, 2019). It is particularly important to use comprehensive measures that include economic, legal, and government support.

CONCLUSIONS

Milk production in Ukraine during 2015-2023 shows a 40.2% decrease in the number of cows, which led to a 30% decrease in milk production; lack of working capital and credit facilities and lack of proper state support for the dairy industry. According to the analysis, in 2023, the bulk of milk production in Ukraine was concentrated in households, where 70.9% of cows are kept and 62.19% is produced. However, these farms sold only 6.89% of their milk to processing companies in 2022, which is caused by low labour productivity, lack of sanitary and hygienic conditions, resulting in poor milk quality and non-compliance with international product quality standards. It was proposed to solve the challenges and problems of milk production quality in households by increasing the number of cows from 1-2 heads to 50 heads, transforming households into family farms or merging them into cooperatives at the state level.

Large dairy producers can produce high quality raw milk, as they have the conditions to apply high technology and build new generation farms that meet modern requirements for the balanced use of all components to produce high quality and competitive dairy products on the internal and external markets. Government support is needed to improve the intensification of dairy farming. The state should facilitate cooperation, stimulate its creation with grants, loan programmes, subsidies, and investments to introduce advanced technologies and technological progress that is taking place in the world. The joint efforts of the government, producers, and processors will ensure the stable

development of high-quality milk production in line with international standards, and the dairy business will become a profitable business and a powerful exporter of dairy products to the global markets. The prospect of further research is the development of milk production under the conditions of its support by state authorities. It is also advisable to pay attention to innovations and marketing strategies in the development of the dairy industry.

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CONFLICT OF INTEREST

None.

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Тенденції розвитку виробництва молока в Україні

Анотація. Протягом 2015-2023 рр. у молочній галузі спостерігаються проблеми, які зумовили зменшення поголів'я корів, скорочення обсягів виробництва, зниження конкурентоспроможності, дисбаланс між попитом та пропозицією на ринку. Враховуючи політичну та економічну ситуацію, що склалася, необхідно було вирішити проблеми молочного виробництва, забезпечити населення країни високоякісними молочними продуктами, а також збільшити їх експорт на світові ринки. Дослідження здійснювалося з використанням абстрактно-логічного, статистичного й табличного методів із ціллю зібрання, обробки й аналізу інформації щодо виробництва молока, поголів'я корів і їх продуктивності, витрат кормів, формування ринкових пропозицій. Графічний метод був використаний для дослідження частки виробництва молока, розподілу рівня самозабезпеченості, динаміки утримання худоби та середньорічного надою. Було здійснено аналіз виробництва молока, досліджено частку виробництва в структурі валової продукції сільського господарства протягом 2015-2023 років. Проаналізовано баланс виробництва і споживання, досліджено розподіл регіонів України за рівнем самозабезпеченості молоком, сформовано рейтинг областей за виробництвом на особу у 2021 р. Проаналізовано й здійснено групування підприємств за поголів'ям, розроблено карту кількості корів у господарствах у 2023 р. та досліджено середньорічний надій протягом 2015-2023 рр. За результати дослідження виявлено, що для покращення ситуації у виробництві молока, необхідно комплексно розглядати державну підтримку, яка сприятиме збільшенню обсягу виробництва та формуватиме відповідні економічно-правові умови для поступової трансформації підприємств у сімейні фермерські господарства або ж у молочні кооперативи. Визначено основні проблеми виробництва молока в українських господарствах, розроблено шляхи їх вирішення та висвітлено практичну цінність підходу до заходів, які сприятимуть підвищенню якості та конкурентоспроможності молочної продукції

Ключові слова: споживання; поголів'я; продуктивність; господарства населення; підприємство; самозабезпеченість

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International experience in the functioning of the soft drinks market

Abstract. The soft drinks market is one of the largest segments of the food market in any country, and its functioning is based on a series of factors, including supply and demand, competition, government regulation, etc. In developed countries, juices, smoothies, and low-sugar drinks are popular, while in developing countries, the market is actively expanding. Accordingly, the study of foreign practices in the soft drinks market helped to identify current trends, assess the effectiveness of government regulation, the implementation of innovative technologies and marketing strategies by companies, and identify opportunities for the development of this market in Ukraine, which was the purpose of this study. The following methods were employed in the study: analysis, synthesis, induction, deduction, content analysis, comparison, generalisation, and other methods of scientific cognition. The study of statistical data revealed that the consumption of soft drinks has been growing steadily in recent years. One of the key drivers of this growth is continuous innovation, as soft drinks market players try to constantly update their products, including ingredients, formulation, packaging, and other aspects to increase sales. It was found that the general factors that determine the functioning of the market are the same – the influence of large players in the supply market, consumer tastes, and their changes, as well as the impact of government regulation methods used by the market; the most commonly used are labelling requirements, food safety regulations, price controls, advertising and marketing restrictions, taxes and subsidies. The study of the practices of foreign countries opens opportunities for further scientific developments in the soft drinks market, which is of practical value and benefit to producers, distributors, consumers, and researchers involved in the research of food industry markets and marketing

Keywords: consumer goods; food economy; multinational companies; state regulation; tax; valuation

INTRODUCTION

The modern economy is characterised by fierce competition, innovative development, and growing consumer demands for products and services. In this context, the soft drinks market is one of the strategic areas of development for the food industry in many countries around the

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world. Demand for soft drinks is growing due to changes in lifestyles and national consumer habits, an increase in the number of vegetarians and the rejection of alcoholic beverages for medical reasons. Increased competition and stricter product quality requirements are forcing soft drinks producers to constantly improve production technologies and develop new flavours.

Various aspects of the functioning of the soft drinks market have been investigated by such foreign and Ukrainian researchers as A.D. Dibrova (2020), who studied consumer preferences in the soft drinks market and concluded that the key factors in consumer choice are price, quality, and taste characteristics of the product. The researcher also noted the growing demand for environmentally friendly and healthy beverages, which is in line with global healthy eating trends. S.A. Pambuk *et al.* (2021) analysed changes in global trade trends and noted that the soft drinks market has become more competitive due to the growing number of producers and the development of innovative products. The researchers emphasised the significance of adapting to new consumer requirements and environmental standards. D.S. Faivishenko (2020) examined the development and trends of the energy drinks market, concluding that this segment is growing rapidly due to the youth audience that actively consumes energy drinks. However, the researcher also noted the need for stricter regulation of this market due to potential risks to consumer health. N. Ahern *et al.* (2023) investigated the state and trends of the domestic soft drinks market, specifically in Ukraine, and found that consumers prefer national producers. They also noted that the Ukrainian market continues to develop, notably through exports to Europe and Asia. M. Arych & A. Oleksyn (2021) investigated the mineral water market in terms of potential, competition, brand management, and found that the mineral water market in Ukraine has considerable potential for growth, especially through the active use of marketing strategies to promote local brands, and emphasised the value of brand reputation management to strengthen competitive positions. J. Bronnmann & J. Hoffmann (2019) studied various aspects of food market development and concluded that the increase in demand for soft drinks is closely linked to the growth of population prosperity and changes in consumer habits. The researchers also noted the impact of globalisation on changing food priorities. M.A. Colchero *et al.* (2019) explored the strategic prospects of Mexican soft drink producers in the foreign market and found that the introduction of taxes on sugary drinks contributed to a reduction in internal demand, but at the same time stimulated the development of export strategies to compensate for losses. C.F. Kurz & A.N. König (2021) analysed the protein drinks market and its characteristics, noting that this segment has become one of the most promising in the health food market and found that consumers who are actively involved in sports and a healthy lifestyle are the main target audience for protein drinks.

M.M. Blasco & M. Jimé-nez-Morales (2020) and K. Lauber (2022) investigated price changes after the introduction of a tax on sugary drinks and found that this regulation reduced consumption of high-sugar products but also caused price increases for other categories of drinks. R. Schmacker & S. Smed (2020) investigated retailers' perceptions of marketing strategies in the soft drinks market and concluded that effective marketing tools, such as promotions and advertising campaigns, greatly influence consumer choice and drive sales. K.V. Jarquin *et al.* (2019) analysed the impact of taxes on soft drink sales in France and Hungary. The researchers found that the introduction of a tax on sugary drinks contributed to a decrease in consumption of these products, while stimulating the development of alternative categories of low-sugar drinks. E. Robinson *et al.* (2021) examined the demand for carbonated beverages and their implications for obesity policy. They concluded that reducing the consumption of carbonated beverages through price increases helps to combat overweight, especially among young people and children.

Overall, these researchers studied soft drink advertising in Spain and its correlation with nutritional values, analysed the impact of migration on food security and agriculture. They investigated how prices and purchases react to tax increases and decreases in the soft drinks market and looked at the relationship between marketing and consumer perception of the brand in

El Salvador, analysing whether high-calorie food and drink served outside the home would improve public health. These studies were mainly aimed at investigating consumer preferences when choosing soft drinks, determining the impact of marketing environment factors on the soft drinks market and its development trends. Therefore, there was a need to review the existing legislation and regulatory framework in this area in other countries, as well as to assess the feasibility of implementing certain methods in Ukraine.

There was a need for further in-depth analysis of changes in consumer preferences, specifically, the growing demand for products that meet the trends of healthy eating, organic production and environmental sustainability (Soft drinks – worldwide, 2024), which led to the investigation of the effectiveness of marketing strategies of leading companies in various countries and adaptation to the specific features of local markets, paying attention to the regulatory impact on market development. The purpose of this study was to summarise the existing types of functioning of the soft drinks market, approaches to its regulation in different countries and to identify opportunities for their use in Ukraine.

MATERIALS AND METHODS

The study included an analysis of the differences in legal requirements for quality, labelling, advertising, and pricing in different jurisdictions. Materials and methods included the use of a wide range of information sources and analytical tools. The materials included scientific articles, reports of international organisations, market research, open-source statistics, government documents, and regulations of the countries under study (Ukraine, the United States, Canada, Estonia, Poland, the Czech Republic, France, Hungary, Saudi Arabia, Chile, the United Kingdom, Norway, Sweden, etc.). Special attention was paid to reports of analytical agencies covering market trends, as well as corporate reports of leading companies in the industry. The research methods included comparative analysis, which helped to assess the difference in approaches to market functioning in different countries. Furthermore, content analysis was used to investigate legislative documents and policies governing the soft drinks market. Statistical analysis helped to interpret data on production, consumption, and export-import operations, which helped to identify key factors influencing the market development.

The following legislative initiatives and statistical sources were used as materials for the study: Draft Law on Amendments to the Budget Code of Ukraine in Connection with the Introduction of an Excise Tax on Waters, Including Mineral and Carbonated Beverages with Added Sugar or Other Sweetening or Flavouring Substances (Draft Law of Ukraine No. 9033-1 "On Amendments to the Budget Code of Ukraine in Connection with the Introduction of an Excise Tax on Waters, Including Mineral and Carbonated Waters, with the Addition of Sugar or other Sweetening or Flavouring Substances", 2023) and the Law on Amendments to the Tax Code of Ukraine, which regulates the introduction of an excise tax on the same categories of beverages (Draft Law of Ukraine No. 9032-1 "On Amendments to the Tax Code of Ukraine on the Introduction of an Excise Tax on Waters, Including Mineral and Carbonated Waters, with the Addition of Sugar or other Sweetening or Flavouring Substances", 2023), the Draft Law of Ukraine No. 7019 "On Amendments to the Tax Code of Ukraine on Excise Taxation of Certain Goods" (2017) was also included in the materials. Furthermore, statistical data from the analytical company Global Data (Market volume of global..., 2019), which provides an in-depth analysis of the soft drinks market at the global level, information from Statista (Volume in the soft drinks market..., 2023), which is an authoritative source of statistical reports on the market, and data from the global B2B network Bizvibe (Top 10 soft drinks companies in the world..., 2022) covering trends and forecasts for the development of the soft drinks market were used. The Food Safety Management System (ISO 22000, 2007) was analysed. The materials used provided a comprehensive basis for analysing the soft drinks market in Ukraine and the possible consequences of the introduction of tax regulation on it.

This study was based on such methods of scientific cognition as research analysis and statistical analysis. Statistical analysis was employed to quantify the data obtained, which resulted in

objective statistical findings. Synthesis and generalisation were used to create a comprehensive understanding of the research object and formulate general conclusions. The synthesis method included the integration of the findings of statistical data analysis, scientific research, market trends, and regulatory requirements to build a generalised model of market functioning, which helped not only to understand the current situation but also to identify potential areas of development. The method of generalisation was to identify key patterns, trends, and factors affecting the market, which helped to summarise the state and prospects of the market and provide evidence-based recommendations for its further development. Summarising the findings helped to provide a holistic vision of the topic and build evidence-based forecasts. The analysis of scientific research involved the review of scientific papers in the industry, which helped to identify the core areas where the market is developing and to identify gaps that require further research. The methodology also involved a critical review of the literature, and a comparison of different approaches used to analyse the market and identify key findings. The systematisation method was used to organise the information collected from various sources in the context of the study, and helped to structure data on market conditions, regulatory requirements, consumer trends, and marketing strategies. The systematisation helped to identify the key categories and parameters of the market, which contributed to a more holistic understanding of its functioning. The comparison method revealed the similarities and differences between the soft drinks markets in various countries, both in terms of the regulatory framework and consumer preferences and marketing approaches. The use of these materials and methods helped to gain a better understanding of the topic and provide a comprehensive analysis of the research object. These tools enabled the analysis of quantitative and qualitative market indicators, such as consumer preferences and regulatory requirements, which increased the reliability of the findings and their practical significance for the development of the industry in Ukraine.

RESULTS AND DISCUSSION

It was found that in 2010-2020, food systems provided a variety of food products needed by consumers in the context of rapid urban population growth (Pohorielova, 2022), as within the market system, food is central as one of the key components of the global and Ukrainian economic markets, responsible for ensuring the basic human need for sustenance (Pambuk, *et al.*, 2021). One of the largest segments of the food market is non-alcoholic beverages, which cover a considerable volume of production compared to other segments (Draft Law of Ukraine No. 9033-1 "On Amendments to the Budget Code of Ukraine in Connection with the Introduction of an Excise Tax on Waters, Including Mineral and Carbonated Waters, with the Addition of Sugar or Other Sweetening or Flavouring Substances", 2023). The main object of the non-alcoholic beverage market is a homogeneous group of beverages, which includes such subgroups as drinking and mineral waters, fruit and berry drinks, tonic drinks, kvass and sour drinks, juices, nectars, and juice-containing drinks. The market also includes semi-finished products for beverages, such as syrups, concentrates, and dry powders (Table 1).

Table 1. Key targets of the soft drinks market

Category of drinks	Main subcategories	Brand examples	Market specifics
Water	Drinking water, mineral, carbonated, still	Evian, Perrier, Aquafina	Growing demand for clean and healthy water and the popularity of eco-packaging.
Carbonated drinks	Sweet, dietary, with reduced sugar content	Coca-Cola, Pepsi, Sprite	Traditionally a large segment, demand for diet drinks is growing.
Energy drinks	Regular, reduced sugar, organic	Red Bull, Monster, Burn	Increased popularity among young people, frequent discussions about security.
Functional drinks	Isotonic drinks, sports drinks, recovery drinks	Gatorade, Powerade, Vitaminwater	Market growth is driven by healthy lifestyles and sports trends.
Juices and fruit drinks	Natural juices, nectars, cocktails	Tropicana, Minute Maid, Cappy	Demand for natural drinks without added sugar.

Table 1, Continued

Category of drinks	Main subcategories	Brand examples	Market specifics
Tea and coffee drinks	Black tea, green tea, iced tea, coffee cocktails	Lipton, Arizona, Starbucks	High popularity in Asia, growing demand for iced tea.
Plant-based drinks	Soy milk, almond milk, coconut water	Alpro, Silk, Vita Coco	Rapid growth due to the trend towards veganism and food alternatives.
Vitaminised and detox drinks	Beverages for detoxification enriched with vitamins	Suja, Smartwater, Bai	Market growth is driven by the trend towards a healthy lifestyle.

Source: compiled by the author of this study based on K. Lauber (2022)

The study found that the soft drinks market consists of a complex system of interaction between producers, distributors and consumers and is highly competitive, highly sensitive to fashion trends and changes in taste preferences (Pohorielova, 2022). The non-alcoholic beverage market is an essential sector of the global food and beverage industry with a diverse product range and considerable global market value. According to Statista, in 2022, the soft drinks market was worth around USD 760 billion (Volume in the soft drinks market..., 2023). Therewith, experts predict that the market will grow by 4.09% annually in the coming years and identify three main segments in this market: carbonated, energy and sports drinks, and non-carbonated drinks (Fig. 1).

According to these data, it was found that the general trend for 2018-2022 is an increase in sales of all three categories. Specifically, the number of sales of carbonated and non-carbonated drinks stayed almost unchanged from 2018 to 2019, but in 2020 they decreased by USD 40 and USD 20 billion, respectively. In 2020, they decreased by USD 40 billion and USD 20 billion, respectively, but grew again in 2021 and 2022. Sales of energy and sports drinks grew year-on-year from USD 150 billion in 2018 to USD 170 billion in 2022. The energy and sports drinks category was found to show the largest sales growth in 2018-2022. The carbonated and non-carbonated drinks categories also grew, but at a slower pace. The industry was heavily affected by the COVID-19 pandemic, which forced many people to self-isolate, causing such a sharp decline in volumes in 2020. The same trend is illustrated in Figure 2, which shows per capita revenue for each of the selected segments.

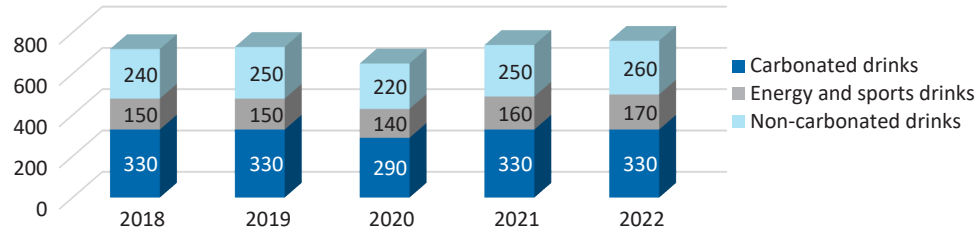

Figure 1. Structure and volume of the global soft drinks market (2018-2022, USD billion)
Source: developed by the author of this study based on data from Statista (n.d.)

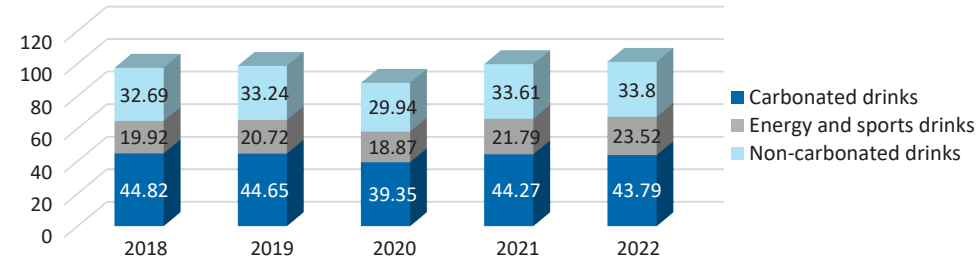

Figure 2. Per capita income by components of the global soft drinks market, 2018-2022, USD
Source: developed by the author of this study based on data from Statista (n.d.)

The greatest change occurred in per capita revenue from energy and sports drinks, which increased by more than USD 3 between 2018 and 2022. In 2018-2022, per capita income from non-carbonated drinks increased by almost USD 1, while per capita income from carbonated drinks decreased by more than USD 1. However, since 2020, per capita income from all categories of soft drinks has started to grow again (Pambuk, *et al.*, 2021). Other figures that confirm the existing trends are also indicative. In 2021, the global soft drinks segment was about 915,109.31 million litres (Soft drinks – worldwide, 2024; Market volume..., 2024). However, according to estimates by Statista (n.d.), other figures are given (Fig. 3).

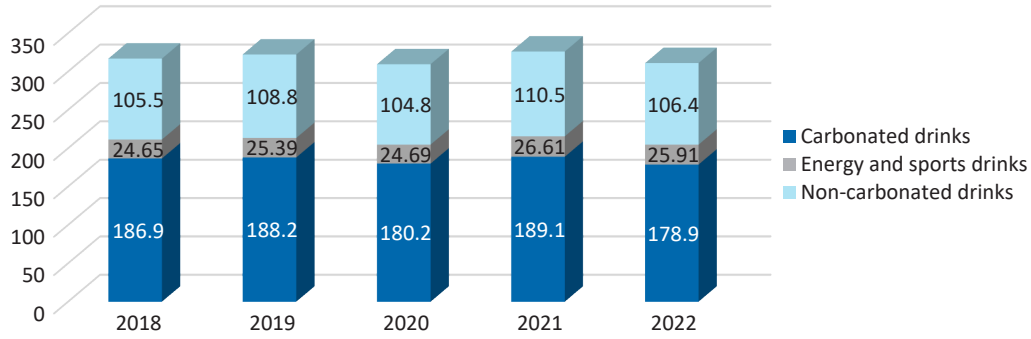

Figure 3. Drinks sales by segments of the global soft drinks market, 2018-2022, billion litres
Source: developed by the author of this study based on data from Statista (n.d.)

Figures 1-3 show that there is a growing interest in healthy lifestyles in society, as the carbonated drinks segment, which is showing a decline, is dominated by various sweet drinks, most of which contain significant amounts of sugar and are unhealthy. This primarily concerns the child target audience (TA), which has historically been a large segment for producers of these products. It was found that the decline in per capita income of carbonated beverages indicates the growing popularity of alternative drinks, such as non-carbonated drinks, and the growth in per capita income from energy and sports drinks indicates an increase in interest in healthy lifestyles and physical activity among the population. Total global consumption in 2019 was 223 litres per capita (Market volume of global soft drinks..., 2019).

The study found that the highest level of soft drink consumption is in North America, with about 325 litres of soft drinks per capita, while in Estonia, the consumption of soft drinks per person averages 120 litres per year, in Poland 182 litres, and in the Czech Republic 20 litres (Alvarado *et al.*, 2019). Most of the beverages consumed are produced by a few dozen large multinational companies, such as Coca-Cola, PepsiCo, Red Bull, Nestle, Unilever, and others (Top 10 soft drinks companies in the world..., 2022). In 2021-2023, the global soft drinks market expanded dramatically, and such multinationals play a crucial role in this process. Transnational corporations have advantages over smaller competitors in this market. For example, they can use their large scale to obtain economies of scale in production and distribution, which leads to lower production costs and higher profitability. Furthermore, multinationals often have greater access to capital and resources, which allows them to invest more in marketing, research, and development (Revenue of the soft drinks..., 2023).

It was found that market growth is driven by the demand for healthier and lower-calorie drinks. This trend has led to the emergence of new product categories, such as tonics, plant-based drinks, milkshakes with alternative milk (almond, oatmeal, etc.), drinks with electrolyte supplements, etc., as national health and regulation of the soft drinks market has become a priority in most developed countries (Abdel-Rahman *et al.*, 2019). Taxation is the most common market regulation mechanism used by

countries around the world. Taxation is aimed at reducing the consumption of unhealthy beverages and increasing budget revenues, which are used to support environmental and health initiatives (Azuma *et al.*, 2020). In countries that have introduced such controls, taxes are typically applied to high-sugar drinks such as soda, tonics, and energy drinks. They are calculated as a percentage of the price of the drink, and the amount can vary substantially. Sugar taxes have been introduced in France, Hungary, Saudi Arabia, Chile, and the United Kingdom, with mixed results in most countries. For example, according to a study (Bandy *et al.*, 2020), in France, a slight decline in soft drink sales was found after the introduction of a tax on sugar-containing soft drinks, while overall soft drink sales increased. In Hungary, there was only a short-term decline in sales of sugar-sweetened soft drinks, which disappeared after 2 years, leading to an overall increase in sales of this drinks segment. However, both effects are characterised by high uncertainty, and it is impossible to establish the exact reasons for such changes.

The most common type of taxation on soft drinks is an excise tax, which is charged based on the volume of the drink. This means that the more drinks are produced or imported, the higher the tax is charged. To reduce the consumption of drinks with a high sugar content, a differentiated excise tax system can be applied, where the tax is charged depending on the sugar content of the drink (Campos-Vázquez *et al.*, 2019). Taxes may be ineffective if people substitute soft drinks for other products high in sugar or calories. Accordingly, the introduction of a tax on sugary drinks has faced opposition from both beverage companies and some consumers, who believe that such taxation is unfair to their products and could lead to job losses and reduced economic growth (Etilé *et al.*, 2021). Another regulatory mechanism often used by governments around the world is advertising restrictions, which have proved to be quite effective with cigarettes and alcohol. The introduction of such restrictions is intended to reduce the ability, primarily of children, to receive information about harmful soft drinks, and to prevent companies from targeting children as a target audience. For example, in Norway, soft drinks advertising to children under 13 is prohibited (Forde & Solomon-Moore, 2019).

A study by Spanish researchers M.M. Blasco & M. Jiménez-Morales (2020) suggests that advertising restrictions should be strict, as soft advertising policies in many countries (e.g., the United States, the United Kingdom, Australia, New Zealand) have proven ineffective in reducing the impact of junk food advertising aimed at children. Researchers have found that more stringent restrictions (e.g., adopted by the Canadian province of Quebec, Norway, Sweden) confirm that banning this type of advertising can be effective in reducing unhealthy food consumption and improving social well-being (Forde *et al.*, 2019). It was argued that soft drink labelling standards play a major role in ensuring information transparency and consumer protection. They form an integral part of the quality control system and services provided by government agencies to help follow food safety regulations and standards (ISO 22000, 2007), and provide information on composition, calorie content, and other indicators. The regulatory role of labelling is that in many countries, health warnings are mandatory for products with high sugar or other potentially harmful ingredients. However, according to research by E. Robinson *et al.* (2021), although in 2018 the UK government proposed mandatory calorie labelling for food and drink, calorie labelling can only moderately influence consumer behaviour. Consequently, warnings about the harmfulness of drinks do not have much effect, as is the case with tobacco and alcohol products. Regulatory methods used in international trade can be divided into the following groups (Fig. 4).

It was found that each of these methods has its advantages and disadvantages: labelling requirements help consumers make an informed choice about the product they purchase; provide transparency and accountability for food producers, but increase production costs, which leads to a shift in responsibility from the producer to the consumer. Due to its comprehensive approach to quality control, the regulation of the soft drinks market includes labelling and safety requirements, support for the agricultural sector, price controls, advertising restrictions and taxation policies. These measures contribute

to ensuring a healthy and transparent industry that benefits both consumers and producers. It was highlighted that regulatory methods protect vulnerable segments of the population from aggressive marketing that encourages unhealthy eating habits but limits producer freedom and competitiveness. Implementing advertising and marketing restrictions is a complex process that requires considerable resources to monitor compliance with all requirements (Pell *et al.*, 2019).

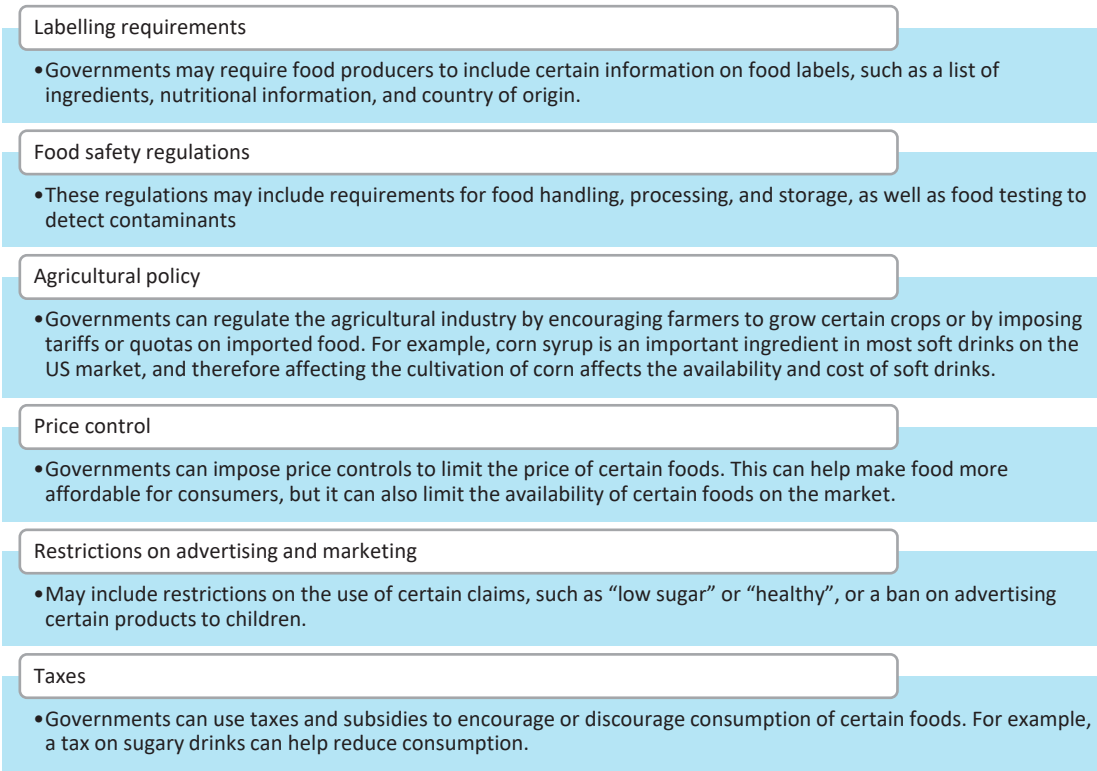

Figure 4. Classification of methods of regulating the soft drinks market

Source: developed by the author of this study

It was found that the most effective measure is taxation, which has no particular alternatives in terms of efficiency. The results of the introduction of excise taxes on sugary drinks can be both positive (reduced demand for sugary soft drinks, increased demand for healthier drinks, impact on producers of excisable goods and encouragement to "modernise" drinks) and negative (high tax administration costs, increased tax burden on the poor, reduced collection of other taxes). The problems faced by other countries (UK, Mexico, Hungary) demonstrate the need for a comprehensive analysis and revision of certain elements of the tax.

The idea of introducing a tax regulation that limits the consumption of soft drinks into the tax system of Ukraine has been discussed by government agencies on several occasions. For example, in 2015, a draft law On Amendments to the Tax Code of Ukraine Regarding the Introduction of Excise Duty Rates on Energy Drinks" was registered (Draft Law of Ukraine No. 2740 "On Amendments to the Tax Code of Ukraine Regarding the Introduction of Excise Duty Rates on Energy Drinks", 2015). In the existing draft laws, two rate options were considered: a flat rate, which is expressed in hryvnias and depends on the amount of sugar or sweeteners in the drink, and an ad valorem rate, which depends on the cost of the drink. Let us outline the advantages and disadvantages of each of the proposed types of rates for this excise tax (Table 2).

Table 2. Advantages and disadvantages of fixed and ad valorem rates

Rate	Advantages	Disadvantages
Fixed	Effectiveness of consumption restriction is proven on other excisable goods, such as alcohol and tobacco products. Does not depend on the price of the product, which means that it does not create preconditions for lowering the price and quality of the product, and there is no need for additional government control over sugar prices. Since sugar and sweeteners are measured in quantitative terms, this rate is convenient and understandable for taxpayers.	There may be tax evasion, which may lie in the inability to determine the object of taxation.
Ad valorem	Possibility of faster and more efficient budget replenishment. Rapid response to changes in the economy, which will automatically lead to an increase in the tax amount.	Since the rate depends on the price of the product, and the market offers a wide range of products of various quality and price, there is a possibility of switching to less expensive and higher quality products. There may be complications with tax administration since the tax base is the retail price of the drink.

Source: compiled by the author of this study

For sugar-containing soft drinks, it is advisable to set a fixed excise rate that would not initially increase the price of the product too much and would not create a strong drop in supply and demand on the Ukrainian soft drinks market, especially during the war (Zubkov, 2023). As of 2023-2024, the excise tax on sugary soft drinks is included in the key areas of tax policy. In early March 2023, two draft laws were registered in the Verkhovna Rada of Ukraine: the Draft Law of Ukraine No. 9032-1 "On Amendments to the Tax Code of Ukraine on the Introduction of an Excise Tax on Waters, Including Mineral and Carbonated Waters, with the Addition of Sugar or other Sweetening or Flavoring Substances" (2023) and the Draft Law of Ukraine No. 9033-1 "On Amendments to the Budget Code of Ukraine in Connection with the Introduction of an Excise Tax on Waters, Including Mineral and Carbonated Waters, with the Addition of Sugar or other Sweetening or Flavoring Substances" (2023). The former amends the Tax Code. Mineral and carbonated waters with added sugar and other sweeteners and flavourings are subject to a tax rate of EUR 0.1 (UAH 4) per litre of beverage. The second stipulates that 50% of the proceeds are to be used to implement programmes to prevent and treat diseases arising from the regular consumption of sugary carbonated drinks. Another 50% will be allocated to the school feeding programme initiated by First Lady Olena Zelenska (Mykhailo Radutskyi discussed..., 2023). It is demonstrated that the Government of Ukraine is ready to adopt and implement foreign practices in the field of regulating the soft drinks market. In the context of a record budget deficit, such sources of revenue will help support the Ukrainian economy. However, the purchasing power of Ukrainian consumers is at its lowest level in 25 years, and it is highly probable that the sole result of this tax will be a decrease in demand for sugary soft drinks. Soft drinks are a large group of flavour products that combine drinks with various properties and production technologies, which are designed to quench thirst and have a refreshing effect. There is still no common understanding of what exactly should be classified as soft drinks in the world.

The study complemented the findings of K. Lauber (2022), which focused on consumer preferences, by providing a broader global context. Specifically, the study analysed consumer trends in various countries and compared them with national data, which provided insight into the unique and common features of soft drink consumption in different regions; and explored aspects such as the impact of culture, climate, economic conditions, and politics on consumer choice across countries in the UK, Ireland, and Wales. This has provided a deeper understanding of how local factors can influence consumer

preferences and allowed us to develop strategies that address these nuances. For example, the study found that consumers in warmer climates prefer refreshing drinks, while in colder regions hot or higher-calorie soft drinks are more popular. It was also added that this demonstrates the need for flexible strategies that consider both global trends and local preferences. Specifically, producers that can react quickly to changes in climate conditions or social trends will gain a competitive advantage in the soft drinks market.

At the same time, M.P. Yuryshinets (2021) focused on local trends in Ukraine. This study offered an international perspective, allowing for a comparison of the Ukrainian market with other markets around the world. This helped to identify global trends that could be implemented in the Ukrainian context to stimulate market development. Specifically, the study analysed issues such as the adaptation of successful marketing strategies from other countries, the impact of international brands on the local market and export opportunities for Ukrainian soft drinks. This study reviewed the practices of countries that have successfully implemented tax policies on sugary beverages and discussed how such measures could be applied in Ukraine to improve public health and encourage consumption of healthier alternatives. Special attention should be paid to the development of cooperation between local producers and international retailers, which would allow Ukrainian beverages to enter foreign markets more quickly. The study provided relevant data on the composition and volume of the global soft drinks market for 2018-2022, valuing it at USD 1.5 billion. The study has expanded on previous findings, providing a more detailed and up-to-date view of market trends and changes in soft drinks consumption. It also helped to understand what factors influence the market in the current environment (Matraves, 2022).

The study provided relevant data on per capita income by component of the global soft drinks market for 2018-2022, valued in US dollars. These data expanded the scientific horizons of previous studies by R. Kanter *et al.* (2019) and R. Schmacker & S. Smed (2020) by offering a more detailed and up-to-date picture of revenues from soft drink consumption in various countries and regions. The study considered the impact of economic factors, changes in consumer habits, and the impact of product innovation on revenues in different regions of the world. The provision of relevant data for the last five years helped to make more accurate forecasts for the future and develop effective strategies for business and politics (Pohorielova, 2022). This study proposed a relevant classification of methods of regulating the soft drinks market, which expanded and supplemented the existing findings of V. Kaushik & C.A. Walsh (2019). The classification included fiscal measures such as taxes and excise taxes on sugar-containing beverages and subsidies to support the production of healthy beverages. Regulatory requirements for labelling and marking, which require the disclosure of calorie content and composition of drinks, as well as restrictions on advertising, especially those aimed at children, were also covered. The classification provided a more detailed understanding of the tools that can be used to effectively regulate the market and promote healthy lifestyles among the population.

CONCLUSIONS

The global soft drinks market is characterised by a decline in demand for conventional sugary drinks with a large amount of sugar and a corresponding increase in demand for non-carbonated, sports, and other alternative drinks, as the demand for a healthy lifestyle is driving the corresponding preferences in food and beverages. The health issue is also causing corresponding changes in the approach of international communities to this market, which is forcing the introduction of various methods of market regulation, such as labelling requirements, price controls, advertising and marketing restrictions, taxes and subsidies, etc. Each of these methods has its advantages and disadvantages and does not allow governments to exert substantial influence on market processes. The analysed practices of other countries showed that taxation brings the greatest economic and social benefits, as the foreign soft drinks market is regulated through various mechanisms. Countries typically implement strict regulations to ensure transparency of product information and protect consumers

from hazardous ingredients. Government regulation also includes tax incentives for healthy drinks and restrictions on advertising to prevent negative impact on consumers, especially the youth and child target audience.

At the same time, Ukraine has proposed to introduce a fixed excise tax rate on sugar-containing products, which will increase tax revenues and minimise the harmful effects of beverages on public health. As of 2023-2025, the excise tax on sugary soft drinks is one of the key areas of tax policy. Two draft laws have been registered in the Verkhovna Rada of Ukraine that would impose an excise tax on mineral and sugar-sweetened soda at EUR 0.1 (UAH 4) per litre, and earmark 50% of the proceeds for programmes to prevent and treat diseases associated with the consumption of such drinks. However, the purchasing power of Ukrainian consumers is at its lowest level in 25 years, and the introduction of the excise tax may lead to a decrease in demand for sugary soft drinks. As soft drinks represent a large group of products, it is important to conduct further research, including analysis of the supply and demand for certain types of drinks, their composition, calorie content, and other characteristics, to effectively regulate the market and meet consumer needs.

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Міжнародний досвід функціонування ринку безалкогольних напоїв

Анотація. Ринок безалкогольних напоїв є одним із найбільших сегментів продовольчого ринку будь-якої країни, функціонування якого ґрунтується на різноманітних чинниках, що включають в себе попит і пропозицію, конкуренцію, регулювання з боку держави та інші фактори. У розвинених країнах популярні соки, смузі та напої з низьким вмістом цукру, тоді як у країнах, що розвиваються, ринок активно розширюється. Відповідно, дослідження зарубіжного досвіду функціонування ринку безалкогольних напоїв дозволило визначити сучасні тенденції розвитку, оцінити ефективність застосування методів регулювання державою, впровадження підприємствами інноваційних технологій і стратегій маркетингу, а також визначити можливості для розвитку цього ринку в Україні, що й становило мету даної роботи. У дослідженні було використано наступні методи: аналіз, синтез, індукція, дедукція, контент-аналіз, порівняння, узагальнення та інші методи наукового пізнання. У результаті дослідження статистичних даних було з'ясовано, що останніми роками обсяги споживання безалкогольних напоїв невпинно зростають. Одним із головних факторів такого зростання є постійні інновації, так як учасники ринку безалкогольних напоїв намагаються постійно оновлювати свої продукти, включаючи інгредієнти, рецептуру, упаковку та інші аспекти з метою збільшення продажів. Було виявлено, що загальні фактори, що визначають функціонування ринку, є однаковими – це вплив великих гравців на ринку пропозиції, споживчі смаки та їх зміна, а також вплив використовуваних державами методів регулювання ринку; найчастіше використовуються вимоги до маркування, правила безпеки харчових продуктів, контроль цін, рекламні та маркетингові обмеження, податки та субсидії. Дослідження досвіду зарубіжних країн відкриває можливості для подальших наукових розробок на ринку безалкогольних напоїв, що становить практичну цінність та користь для виробників, дистриб'юторів, споживачів і науковців, які займаються вивченням ринків харчової промисловості та маркетингу

Ключові слова: споживчі товари; продовольча економіка; транснаціональні компанії; державне регулювання; податок; оцінка

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Hotel business in the context of global trends

Abstract. The hotel business plays an important role in the development of the country's economy, as it provides jobs, stimulates tourism, and promotes cultural exchange. In the context of global change, in particular post-Soviet reconstruction and military aggression, its importance is only growing. The relevance of the study of the state and prospects of development of the hotel business is conditioned by significant changes taking place in this area and the need to adapt to new realities. In 2024, there was an active introduction of digital technologies and sustainable practices at the international level, while in Ukraine the hotel industry faced unique difficulties related to the security situation. Comparing the International and Ukrainian hotel services markets helps to identify key trends and challenges and develop recommendations for the development of the industry. The purpose of the study was to analyse the impact of global events on the global hotel industry, identify the main trends and problems, and suggest ways to improve the situation in the Ukrainian hotel sector. Research methods included analysis of statistical data, a systematic approach, case-study, comparison of international and national indicators and practices, generalisation, abstract and logical method, and synthesis. The results of the study showed that despite the positive dynamics of the international hotel business, the Ukrainian hotel industry is experiencing significant difficulties due to the war in the country. Against the background of negative trends, the success of the international hotel business is conditioned by the availability of government programmes, support for business development, investment in new technologies and

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innovations. To restore and develop the Ukrainian hotel business, it was important to introduce positive foreign practices, in particular sustainable development, and adapt them to the realities of the modern Ukrainian market. The practical value of the study was to provide recommendations for improving the situation of the Ukrainian hospitality industry in the market, adapting to new conditions and using international experience for the development of the hotel business

Keywords: hospitality industry; international service market; crisis; adaptation; sustainable development

INTRODUCTION

The hotel business is one of the key sectors of the hospitality industry, which plays an important role in shaping economic stability and regional development. The relevance of hotel business research in the context of global changes is extremely high, especially for the Ukrainian market. The COVID-19 pandemic and subsequent economic and social crises, including military aggression, have significantly affected the tourism sector, in particular, the hotel business. Global trends in recovery and adaptation, such as innovative technologies and new business models, have a significant impact on the development of the industry. In Ukraine, where the hotel business faces unique challenges, studying these trends and comparing them with international experience is crucial for developing effective recovery and development strategies. Analysis of the current state of the hotel business in Ukraine in comparison with the global trends of the hotel industry will identify key problems and prospects for the development of the industry and provide recommendations for improving its competitiveness on the world stage.

The COVID-19 pandemic, which can be considered one of the largest socio-economic crises of the beginning of the 21st century, affected all spheres of life; so many researchers have investigated its impact on various sectors of the economy, including the hotel industry. M. Breiera *et al.* (2021) note that the crisis is a trigger for the development of innovative business models that allow not making a profit during the crisis, but also ensuring the long-term development of the enterprise. Therefore, entrepreneurs in the hospitality industry should actively and constantly develop and adapt their business models. According to E. Çoban & C. Ozel (2022), effective communication, unity, and solidarity of the hotel company's team is important in the fight against the crisis. V. Magnini *et al.* (2020) concluded that industry disruptions caused by COVID-19 highlight the importance of using key performance indicators (KPI), reliable data to compare competitors and accurately identify competitive groups for hotels, which are prerequisites for adapting and improving efficiency in an unstable environment. N. Korzh & N. Onyshchuk (2020) and A. Singh & V. Singh (2022), who investigated the impact of the pandemic on the development of the hotel market, agree that this challenge has led to a leap in the development of online information and communication technologies in this industry. According to R.T.R. Qiu *et al.* (2021), the impact of fluctuations in demand during crisis events is crucial for dynamic management in the hospitality industry, so hotels should choose demand forecasting methods responsibly and not be limited to consumer surveys on social media, which has become a very popular feedback tool recently.

Considerable attention of researchers was paid to the analysis of the international hotel services market, with an emphasis on testing positive practices, in particular, the introduction of modern information technologies and innovative approaches to hotel business management. Thus, Gursoy *et al.* (2022) suggest that the meta-universe has already changed and continues to change the way the hospitality and tourism industry works. The study by V. Purushothaman (2023) reflects the main trends and forecasts for the development of the global hotel business, which indicate a significant growth of this market segment in the near future and rapid innovative development towards increasing the competitiveness of modern forms of hotel business. A. Methli (2024) argues that the modern hotel industry is a dynamic environment for business leaders and investors to implement

and support innovation. In order to navigate the changing hospitality landscape and benefit, it is necessary to follow the latest trends, market data, and clear growth forecasts. According to W. Zheng *et al*. (2024), increasing competition and uncertainty create the need for highly efficient forecasting models and offer a proprietary spatiotemporal forecasting model that expands the application of artificial intelligence-based models in hotel forecasting. Their forecast indicates the rapid dynamics of endogenous development of the Chinese hotel market.

However, Ukrainian researchers focus on adapting the hotel industry to the challenges of war, analysing the impact of the security situation on tourist flows and finding new strategies for business survival. Thus, V. Danylenko-Kulchytska (2022), studying the impact of the war on the hotel business, came to the conclusion that any crisis leads to the emergence of new opportunities, and that the combination of the principles of consistency (understanding strategic goals, timely control, transparent internal processes and analytics) and flexibility (speed of making creative, non-standard decisions) contributes to the economic survival of enterprises in modern conditions of total unpredictability. In addition, many studies are devoted to finding ways to develop the Ukrainian hotel business in the context of global changes. According to I. Chuieva (2023), the Ukrainian hotel industry is characterised by the development of specialisation of hotels and hotel services, the creation of international alliances and hotel chains, the development of small businesses in the hotel industry, and the increasing involvement of new information technologies in the technological process of hospitality. Given the multidimensional nature of the existing studies, it is feasible to discuss the prospects of researching this issue and the need to deepen knowledge of how global challenges such as the pandemic and military aggression have affected the hotel business in Ukraine compared to global trends in the recovery and development of this industry.

The purpose of the study – identify the main trends and problems of the modern hotel services market and develop recommendations for the restoration and sustainable development of the Ukrainian hotel business in the post-Soviet period and during military aggression, considering the international experience. To achieve the goal, the analysis of the impact of global changes on the hotel industry was carried out, key trends and challenges faced by hotels in the international and Ukrainian services market were considered, the need for the introduction of digital technologies and sustainable practices, in particular, in the Ukrainian context, was proved, which will contribute to improving the competitiveness and adaptation of the hotel industry to new realities.

MATERIALS AND METHODS

The study applied an integrated approach and used general scientific and special methods, the main of which were: statistical and economic analysis to identify trends and patterns in the development of the hotel industry; a systematic approach to consider the relationships and interactions between various aspects of the hotel business, including the impact of international trends, public policy, and economic conditions on the development of the industry. In addition, comparative analysis was used to investigate international experience; abstract and logical method, synthesis and generalisation to substantiate the main results and conclusions of the study.

The main focus was on data collection methods and analytical tools that allowed for representative results. The study was conducted in 2024 at the National University of Life and Environmental Sciences of Ukraine (Kyiv) in cooperation with the Association of Hotel Unions and Hotels of Ukrainian Cities The main focus was on the analysis of official statistics of the State Statistics Service of Ukraine on the activities of Ukrainian hotels in the period from January 2018 to December 2022 (Official website of the State Statistics Service of Ukraine, n.d.). This allowed tracking changes in the hotel services market in Ukraine in the context of post-Soviet recovery and military aggression. Analytical calculations on global trends in the hotel industry were carried out based on statistical data of the international hotel market, which are presented on the official websites of international organisations and consulting companies, in particular: Bismart consulting (2024), Statista (2024), MMR

(Maximize Market Research, 2024). Salary expert (2024), MKG Consulting (2024), and UNWTO (2024) were also involved for the actual period 2018-2023 and forecast for 2024-2028.

To collect information about current trends in the hotel business and the hospitality industry, the survey method of expert managers of Ukrainian hotels was used. This provided a deeper understanding of the market situation, and helped to identify the real problems faced by hotel companies. The surveys were conducted using the Google Workspace cloud software and Google Forms. Representatives of 18 hotels from the central (Kyiv Region), southern (Odesa Region) and western (Lviv Region) parts of Ukraine took part in the survey, which ensured representativeness and objectivity of views on the state of the hotel industry. All experts were informed about the study and gave their consent to the use of personal data (Declaration of Helsinki, 1964).

An important element of the research was familiarisation with the laws and regulations governing the activities of the hotel business in Ukraine (Law of Ukraine No. 325/95-BP "On Tourism", 1995), procedure for providing temporary accommodation services (Resolution of the Cabinet of Ministers of Ukraine No. 297 "On Approval of the Procedure for the Provision of Temporary Accommodation Services", 2006), rules for the use of hotels and similar means of accommodation and provision of hotel services (Order of the State Tourism Administration of Ukraine No. 19 "On Approval of the Rules for the Use of Hotels and Similar Means of Accommodation and Provision of Hotel Services", 2004). It was also important to get acquainted with the strategies that support the development of the industry (Decree of the Cabinet of Ministers of Ukraine No. 168-r "On Approval of the Strategy for the Development of Tourism and Resorts for the Period Until 2026", 2017).

To perform analytical calculations, the MS Excel software tool for processing statistical data and plotting graphs was used, which allowed making accurate calculations, assessing market trends, and visualising the results obtained, which increased the clarity of the information presented. The case-study method was used to analyse positive practices in the hotel business. This has facilitated the study of the experience of other researchers and the development of proposals for implementing the experience in Ukrainian realities. The use of comprehensive methodological tools, including statistical and economic analysis, a systematic approach and expert surveys, provided a comprehensive analysis of the hotel industry. This helped to identify current trends and problems and formulate recommendations for adapting the Ukrainian hotel business to new business conditions, in particular, through the practice of rapid response to consumer needs and responsible management.

RESULTS AND DISCUSSION

In the context of global economic and political changes, the analysis of trends, challenges, and opportunities for the development of the hotel business allows optimising management strategies, increasing competitiveness, and ensuring sustainable development of the sector. In 2024, the international hotel services market demonstrated effective practices for Ukrainian businesses to follow. It was established that when the Ukrainian hotel services market faced serious problems due to Russia's military aggression against Ukraine, the international hotel services market showed an impressive recovery from the COVID-19 pandemic. Already in 2023, there was an excess of the volume of the international hotel services market for the pre-ice period by 11%, and the forecast for the next 5 years indicates a rapid growth of the international hotel market (Fig. 1).

According to Statista (2024), in 2024, revenue in the international hotel services market was expected to grow by almost 9% compared to the previous year, 2023, and more than 2 times compared to the year before COVID, 2020, and would amount to approximately USD 446.5 billion. Experts expected the annual growth rate of the international hotel services market to reach 3.32% in 2024-2028, with an indicator of USD 508.9 billion in 2028. It was also expected that the number of consumers of the hotel product will grow to 1.4 billion customers by 2028. It was projected that in 2028, 82% of hotel revenue will be achieved through online sales. It was also expected that in 2024, the United States of America would receive the largest income from hotel services compared to other countries (Statista, 2024). This is not surprising, since the rating

of the Top 10 largest hotel chains in the world in 2023 included six representatives of the US hotel business (1st place in the rating – Marriot, 3rd place – Hilton, 4th place – IHG, 5th place – Wyndham, 8th place – Choice, 10th place – BWH), three – China (2nd place – Jin Jiang, 6th place – H World Group, 9th place – BTG), one – France (7th place – Accor). In addition, in the Top 5 countries that are projected to receive the largest revenue from hotel services in 2024, in addition to the United States, included the following: China, Japan, the United Kingdom, and Germany (MKG, 2024).

North America (USA, Canada, and Mexico) occupied, at the end of 2023, a dominant position in the international hotel services market with a market share of more than 30% (Fig. 2).

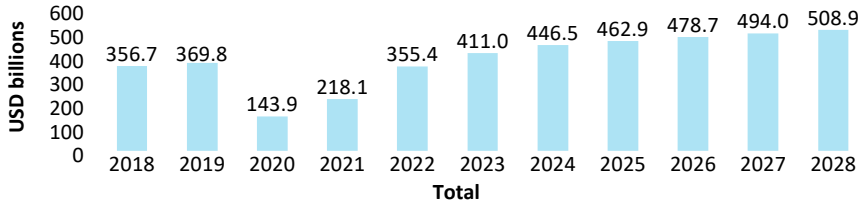

Figure 1. Volume of the international hotel services market, 2018-2028

Source: compiled by the authors based on Statista (2024)

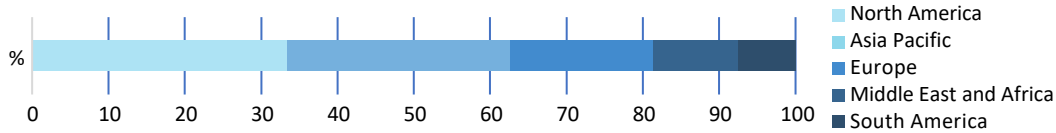

Figure 2. Regional structure of the hotel services market, 2023

Source: compiled by the authors based on Maximize Market Research (2024)

The 2nd place in terms of market share is occupied by the Asia – Pacific region (China, South Korea, Japan, India, Australia, Indonesia, Malaysia, Vietnam, Taiwan, Bangladesh, Pakistan, etc. countries of the region), the 3rd place is occupied by Europe (Great Britain, France, Germany, Italy, Spain, Sweden, Austria, and other European countries), the 4th – by the countries of the Middle East and Africa (South Africa, the United Arab Emirates, Egypt, etc.), and the last, with a share of less than 10% – Brazil, Argentina, and the rest of South America (Maximize Market Research, 2024).

A comparative analysis of the projected volumes of hotel services markets in North America, as the leader, and Europe, to which Ukraine belongs, shows that the North American hotel services market will reach USD 126.9 billion in 2024, and the European market – USD 113.4 billion, which is USD 13.5 billion (10.63%) less (Fig. 3).

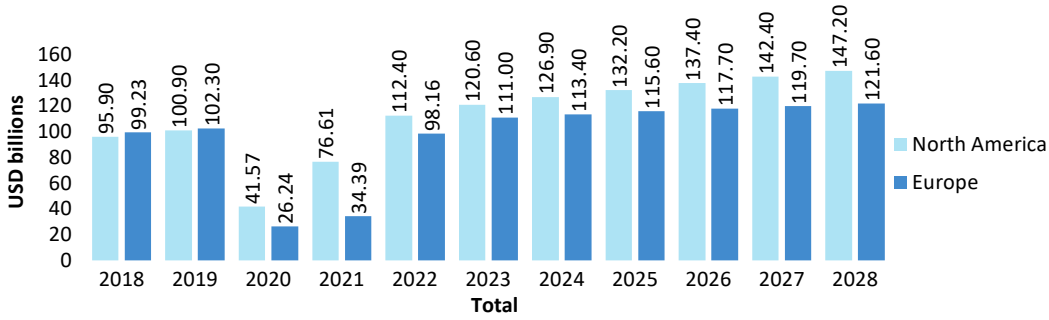

Figure 3. Hotel services market size in North America and Europe, 2018-2028

Source: compiled by the authors based on Statista (2024)

It is expected that in the period 2024-2028, the annual growth rate of the hotel services market in North America will be at the level of 3.78%, in Europe – 1.76% and, respectively, USD 147.2 billion and USD 121.6 billion in 2028 The expected growth in the number of hotel users in North America by 2028 will reach 267.10 million people, Europe – 293.10 million people. According to forecasts, in 2028, 81% of North American hotel revenue will be achieved through online sales, while hotels in Europe will increase by 5% with an indicator of 86%. It is expected that by the results of 2024 North America will be the world leader in the international hotel services market with a market volume of USD 110.500 million. In Europe, the largest increase in the volume of the Spanish hotel services market is projected due to the activation of international tourism (Statista, 2024). Using the classification of hotels by stars, today the world has the most 3-star hotels (50%) of the total number, 4-star hotels are 23% less compared to 3-star hotels (27%), and 2-star hotels – 14%. 5-star (7%) and 1-star (2%) hotels have the lowest share, which is respectively due to the high cost in the first case and poor quality of services in the second case (Fig. 4).

Next, the study considers the salary level of hotel workers in different parts of the world according to the regional structure of the market: North America (using the example of the United States and Canada), Asia-Pacific (China, Australia), Europe (Germany, Ukraine), the Middle East and Africa (South Africa, Egypt), South America (Argentina), using official statistics (Salary expert, 2024).

The United States is the leader of the global hotel industry in terms of wages. Thus, the salary of an American employee working in the hotel business is one of the most competitive in the world, with an average monthly income of USD 4,454.25. Thus, America, Germany, Australia, and Canada have the most competitive salary levels in the labour market: on average, an employee receives more than USD 20 per hour and has an average of more than USD 3,000 per hour of operation USD США per month. China and South Africa are in an intermediate position: on average, an employee receives up to USD 10 per hour of work and has an average of up to USD 2,000 per month. The worst wage situation has developed in Argentina, Ukraine, and Egypt: on average, an employee receives up to USD 5 per hour and has an average of USD 1,000 per month (Salary expert, 2024). Despite the fact that a particular country belongs to the same region, the level of remuneration differs significantly (Table 1).

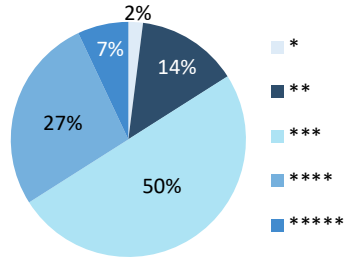

Figure 4. Share of hotels by star rating in the international hotel market, 2023
Note: * – hotel classification by stars
Source: compiled based on Statista (2024)

Table 1. Salary of employees of the hospitality industry in different countries of the world, as of June 2024, USD

Country	Annual income for a beginner	Average annual salary	Annual income of an employee with work experience	Average monthly salary	Annual bonus	Average hourly wage
USA	39,531	53,451	65,089	4,454.25	1,144	25.70
Canada	31,044.93	41,975.86	51,115.35	3,497.99	898.26	20.18
China	14,160.72	18,942.70	23,315.62	1,578.32	405.33	9.11
Australia	35,928.45	48,499.85	59,727.17	4,041.65	1,038.19	23.31
Germany	36,946.43	49,955.86	60,832.69	4,162.98	1,069.00	24.01
Ukraine	4,334.96	5,767.24	7,137.48	480.60	123.42	2.77
South Africa	11,745.92	15,746.10	19,339.57	1,312.70	336.96	7.57
Egypt	-	2,617.04	-	218.09	56.00	1.26
Argentina	5,548.17	7,268.19	9,135.03	605.68	155.54	3.49

Source: compiled by the authors based on Salary expert (2024)

According to the results of the study, international players in the hotel industry quickly emerged from the crisis and adapted to new conditions, using innovative technologies and strategic approaches to overcome the consequences of the pandemic. This allowed them to restore their previous indicators and also exceed them, demonstrating stability and dynamic growth. At the same time, the Ukrainian hotel services market faces unprecedented challenges that significantly slow down its recovery and development. According to the official website of the State Statistics Service of Ukraine (n.d.), the volume of services sold by hotel business entities in 2022 amounted to UAH 7,830.84 million, which is 29.97% less than in 2020 during COVID (Fig. 5).

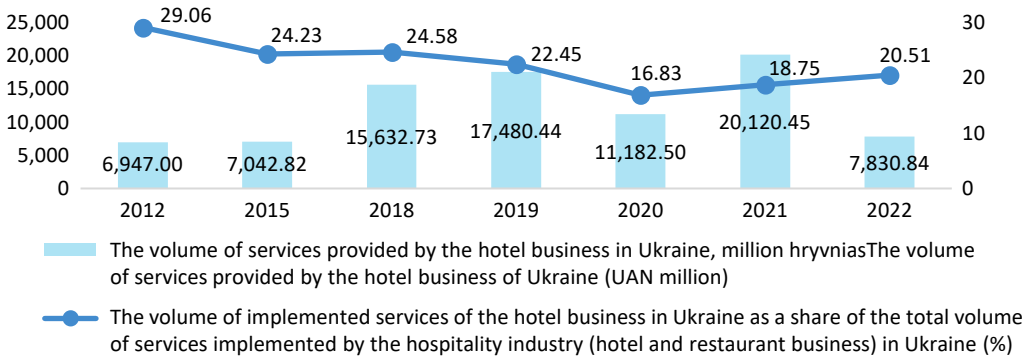

Figure 5. Volume of services sold by hotel business entities in Ukraine, 2012-2022
Source: compiled by authors based on the Official website of the State Statistics Service of Ukraine (n.d.)

For the international hotel business, the post-holiday period is characterised by positive dynamics. At the same time, due to the full-scale invasion, this trend was not relevant for Ukraine. In 2022, hotel companies in Ukraine received a loss of UAH 6,526.76 million. The share of hospitality companies that made a loss was 55.4% and, accordingly, 44.6% made a profit, while 59.1% of companies in the restaurant business remained profitable – UAH 3,850.10 million or 60% of the loss was accounted for by small businesses (Fig. 6).

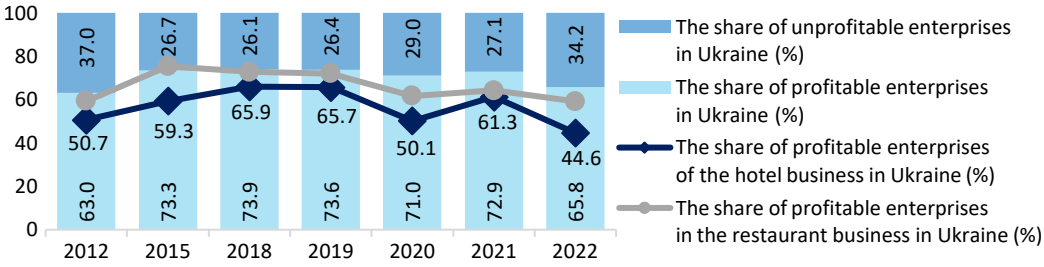

Figure 6. Net profit (loss) of hotel business entities in Ukraine, 2012-2022*
Note: companies that provide temporary accommodation and catering services are taken into account
Source: calculated by the authors based on Official website of the State Statistics Service of Ukraine (n.d.)

In 2022, 6,275 hotel business entities operated in the Ukrainian hotel services market (80.30% of them were individual entrepreneurs – 5,039 units), which took a share of 0.36% in the structure of all existing business entities in Ukraine and 10.87% in the total structure of all existing business entities in the hotel business of Ukraine (Official website of the State Statistics Service of Ukraine, n.d.). A decrease in the number of hotel businesses in the near future is expected, which is due to a number of factors: physical loss as a result of military operations,

lack of demand for services, a decrease in the tourist flow, and an increase in the cost of purchasing energy products etc. (Fig. 7). As of the beginning of 2023, the number of employed employees in the hotel business entities of Ukraine amounted to 27,934 people, of which 35.89%, or 10,025 people, were employed by individual entrepreneurs (Fig. 8).

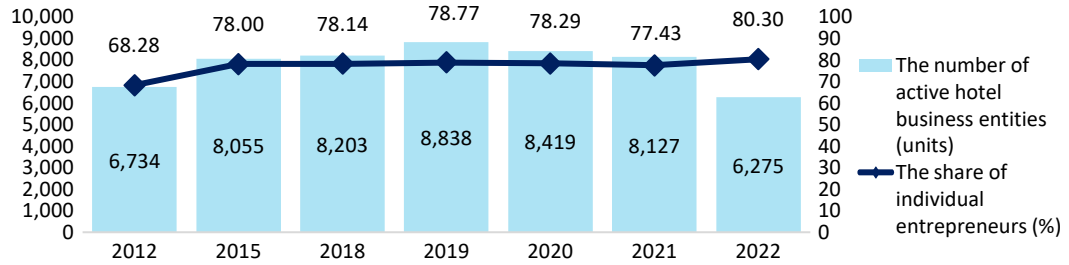

Figure 7. Number of operating hotel business entities in Ukraine, 2012-2022
Source: calculated by the authors according to the Official website of the State Statistics Service of Ukraine (n.d.)

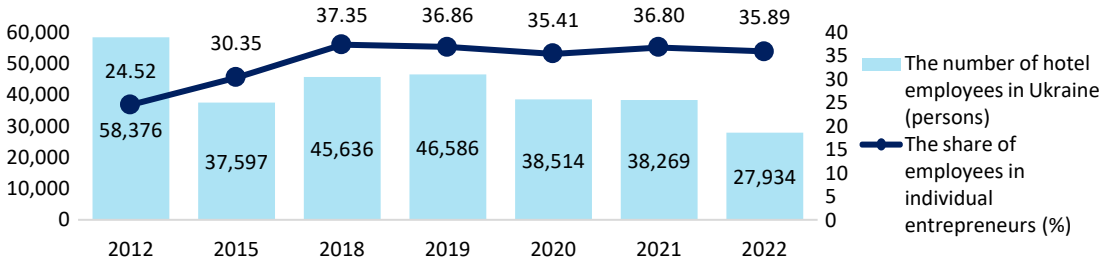

Figure 8. Number of employees employed by hotel business entities of Ukraine, 2012-2022
Source: calculated by the authors according to the Official website of the State Statistics Service of Ukraine (n.d.)

The share of employed employees in the hotel business in the structure of the total number of employed in the Ukrainian economy in 2022 was 0.37%. The indicator shows a downward trend, started as a result of restrictions imposed during COVID-19 and continued by martial law in Ukraine (Official website of the State Statistics Service of Ukraine, n.d.). It was established that the cost of purchasing energy products and payments to contractors in Ukraine tends to increase (Fig. 9).

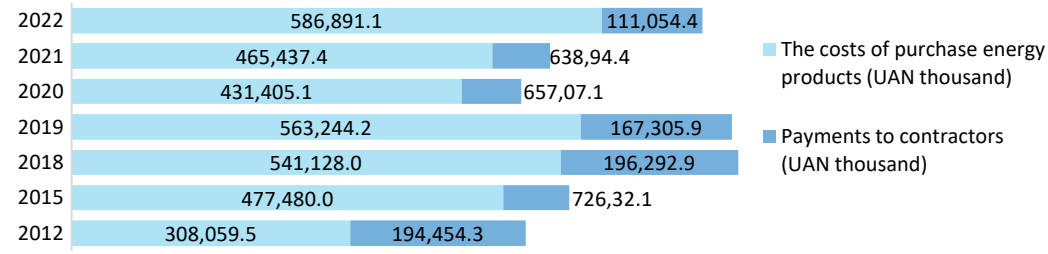

Figure 9. Expenses for the purchase of energy products and payments to contractors of hotel business entities of Ukraine, 2012-2022
Source: compiled by the authors based on Official website of the State Statistics Service of Ukraine (n.d.)

Total expenses in 2022 amounted to UAH 697,945.5 thousand (84.09% – energy products and 15.91% – payments to contractors). According to Official website of the State Statistics

Service of Ukraine (n.d.) in 2022, the amount of capital investments of Ukrainian hotel business enterprises amounted to UAH 747,230 thousand, of which UAH 731,684 thousand (97.92%) – capital investments in tangible assets and UAH 15,546 thousand (2.08%) – in intangible assets.

Investments in fixed assets had the following structure: UAH 513,840 thousand (70.23%) invested in the construction and reconstruction of buildings; UAH 164,299 thousand (22.45%) – in machinery and equipment; UAH 46,615 thousand (6.37%) – in other; UAH 6,550 thousand (0.90%) – in existing buildings and structures; UAH 380 thousand (0.05%) – in land. Capital investments in intangible assets amounted to: UAH 14,300 thousand (91.99%) in the purchase of software; UAH 1,056 thousand (6.79%) in other assets; UAH 190 thousand (1.22%) in concessions, patents, licenses, trademarks, and similar rights. In 2022, the least material capital investment fell on the land of UAH 380 thousand, when in 2012 – UAH 57,217 thousand (associated with the European Football Championship), 2015 – UAH 41,894 thousand, 2018 – UAH 17,861 thousand, 2019 – UAH 19,471 thousand, 2020 – UAH 88,39 thousand, 2021 – UAH 32,983 thousand (Official website of the State Statistics Service of Ukraine, n.d.).

During the study period 2012-2022, the share of capital investments in intangible assets did not exceed 2.47%, which does not correspond to trends in the international hotel services market. The profitability of operating and all activities of Ukrainian hotel businesses in 2022 took a negative value (-22.3% and -42.5%, respectively), which indicates negative trends in the industry (Fig. 10).

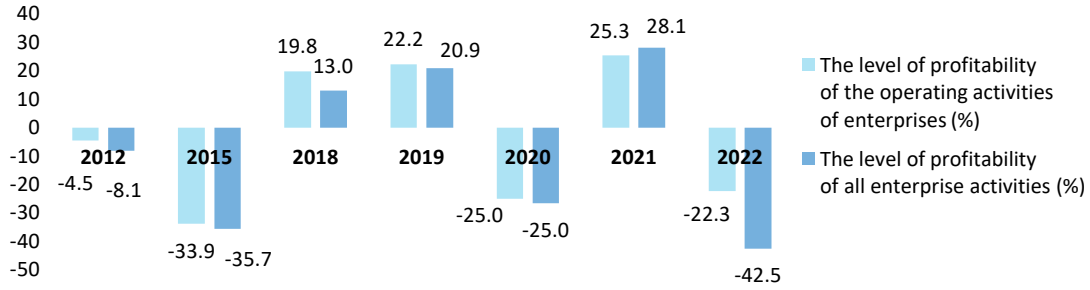

Figure 10. Profitability of operating and all activities of hotel business entities in Ukraine, 2012-2022
Source: compiled by the authors based on Official website of the State Statistics Service of Ukraine (n.d.)

According to the results of a survey of managers of a number of Ukrainian hotels, it was found out that the key problem of the hotel business in Ukraine is related to functioning under martial law. Against this background, there are problems with the current management and development of the hotel business. Experts identified and ranked the following problems: lack of security guarantees; reduced tourist flow; instability of the exchange rate, deterioration of the investment climate, and unpredictable changes in legislation. Free access to energy products; changing (disrupting) the usual logistics chains; reducing the purchasing power of the population; providing professional personnel, in particular top managers (due to migration and outflow abroad and to other industries). Quality of training of young specialists; ensuring the competitiveness of employees in the labour market and wages. Thus, it was found out that the security situation related to martial law is the main problem and a serious challenge for the functioning and development of the hotel business in Ukraine. The study considered the listed problems from the standpoint of strategic management in the context of the recovery economy of Ukraine, because the opinion of the experts of the survey on the ranking of problems has changed and the following three have become critical: attracting investment for the restoration and modernisation of the infrastructure of the hotel industry and the business itself; the quality of training of specialists and the provision of professional personnel; ensuring

competitiveness through the introduction of modern technologies and digitalisation of business processes. One of the most significant problems that the hospitality industry can face is the lack of qualified hotel specialists.

This issue requires active cooperation between higher education institutions and hotel companies to develop educational programmes, improve the level of professional training, and attract young people to the industry. Analysis of the international experience has shown that the success of the hotel business is ensured by: the availability of a state target programme for the development of the industry; regulatory support that meets the requirements of modernity; availability and diversity of state lending programmes; state grants for the establishment, support, and development of business; collaboration with other sectors of the economy; development of international hotel chains; promotion of tourism; promotion of the development of green hotels and access to the latest developments, in particular, in the field of information technologies (virtual and augmented reality, artificial intelligence, etc.).

It was established that an important place in the development of the Ukrainian hotel industry is occupied by state support, reflected in the programme of the Strategy for the development of tourism and resorts of Ukraine for the period up to 2026. In the context of the problems discussed above and their solution, it was noted that the existing order of the Cabinet of Ministers of Ukraine requires modernisation and improvement from the standpoint of an integrated approach focused on the integration of international experience, because it is necessary to create mechanisms that will ensure close cooperation between government agencies, business and educational institutions to train qualified personnel for hospitality industry enterprises. It was emphasised that it is also necessary to develop programmes to support innovation, in particular, in the field of digital technologies, which would allow introducing new solutions. It was found out that the third important step is to ensure the availability of lending and grant support for new projects in the field of green tourism and hotel business. The strategy should include active promotion of Ukrainian resorts and tourist destinations on the international market, which will help attract foreign tourists and investors in the post-war period. It was argued that the success of international players in the hotel business is based on their ability to quickly adapt to changes and use new technological and business opportunities for development.

In this context, the research focused on the analysis and comparison of economic indicators of the International and Ukrainian hotel services market, which helped to identify the key problems faced by the Ukrainian hotel industry and expand previous knowledge about the problems of the industry, highlighted in the papers by I. Rumiantseva & I. Mendela (2024) and O. Olshanska *et al.* (2024), focusing on the problems of staffing and low wages of employees. It is noted that this is one of the underestimated factors of slowing down the strategic development of the hotel industry, which will have more serious consequences in the future. This is also confirmed by the results of a study of employment in the hotel business conducted by L. Bezruchko *et al.* (2023), which indicate negative trends and causes related to military aggression and economic crisis. The proportion of workers leaving the industry poses a serious threat to the sector's recovery. One possible solution is to develop retraining programmes for employees who are out of work, and create conditions for attracting new specialists through higher wages. The analysis of wages in different countries also indicates the need to review the compensation system in the Ukrainian hotel business. At a time when the average salary in the industry is significantly lower than in countries with developed markets, Ukraine should introduce strategies that will increase the competitiveness of employees in the market.

Special attention in this study was paid to the aspects of financial stability and competitiveness of the Ukrainian hotel business, since in the literature, in particular in the papers by O. Morhulets & O. Nyshenko (2023) and O. Nikolaichuk *et al.* (2021), who investigated these aspects, did not sufficiently highlight the role of government support programmes in the development of the hotel business. Based on the findings of other researchers, the study suggests the introduction of targeted programmes that

consider the specifics of the Ukrainian economy and the needs of the hotel sector. It is necessary to step up state support for small and medium-sized businesses, because these enterprises suffered the most during the crisis. The study also pointed out the importance of international experience in the field of hotel services management, which can serve as a template for implementing successful practices in Ukraine. For example, studies have shown that in high-income countries such as the United States and Australia, investing in the latest technologies and innovative solutions significantly contributes to improving the quality of service and customer engagement (Ugurluay & Kirikkaleli, 2022). This aspect can become a key one for the Ukrainian market, where modern technologies have not yet received sufficient development.

In addition, the results of the study indicated that online sales are becoming the dominant channel for selling hotel services, which underlines the importance of digitalisation for the Ukrainian sector. In the face of limited opportunities for traditional businesses, the active use of online platforms using artificial intelligence can help attract new customers and reduce the cost of promoting services. The study confirms the opinion of I. Breukelen (2023), R. Wiastutti *et al.* (2024), D.J.-E. Pelet *et al.* (2021), according to which the successful functioning of the hotel services market requires the introduction of the latest information and communication technologies. Concretising the findings of researchers, it is noted that among the information and communication innovations can be: the creation of various applications for hotels (such as Booking.com or HotelTonight), which provide convenient access to hotel services); the use of virtual reality (virtual hotel tours that allow potential guests to get acquainted with rooms and territory, as Marriott does in its VR tours) and artificial intelligence (chatbots for customer service, as in the Hilton, which help to solve issues and book services). The introduction of contactless registration (systems such as Mobile Check-In, which allow guests to register via mobile devices without having to visit the front desk) can also be updated and included in the list of the latest information and communication technologies in the industry. In addition, the introduction of innovations not only increases the convenience for guests, but also allows hotels to optimise their business processes, reduce costs and increase management efficiency. Using data analytics will help to better understand the needs of customers and adapt offers to their preferences, which contributes to improving the level of service. In addition, it is argued that the integration of the latest technologies can be an important factor in attracting new customers and increasing the loyalty of existing ones, as tourists increasingly appreciate innovative solutions that provide convenience and safety. Therefore, adapting to technological changes is critical for the sustainable development of the hotel business in the face of global challenges.

The results of the study indicate that the Ukrainian hotel services market requires active actions to improve the situation. They can be used for: developing adaptive strategies (recommendations for collaboration with educational institutions, introducing modern technologies and flexible business models will help hotels adapt to new market conditions); improving competitiveness (studying international practices will allow Ukrainian hotels to integrate the best solutions and increase their attractiveness for tourists). For social responsibility (identified cases of successful adaptation of services can serve as an example for other enterprises in the field of hospitality, contributing to the development of socially responsible business) and support for public policy (the results can be used by government agencies to form policies that support the development of tourism infrastructure and contribute to the restoration of the hotel business). The successful experience of international companies can become the basis for adapting new strategies and practices that can contribute to the recovery of the industry in Ukraine (Karolop & Revenko, 2021). Introducing innovative technologies, developing online sales, raising wages, and supporting small businesses are all aspects that can significantly change the situation for the better. However, to achieve success in the face of contemporary global challenges, it is important not only to adapt international experience, but also to actively implement changes that consider the features of the national context and the needs

of the internal market (Ugurluay & Kirikkaleli, 2022). This is the only way to ensure the sustainable development of the hotel business in Ukraine and increase its competitiveness in the international arena.

CONCLUSION

The international hotel business has overcome the effects of COVID-19 and is showing positive development trends. The study integrated the analysis of the impact of global changes, such as the pandemic and military aggression, on the Ukrainian hotel business, considering international experience and current industry trends. The unique challenges faced by the hotel industry in Ukraine were identified, and recommendations were formulated based on a comparative analysis of world practices. In particular, the focus was on the introduction of innovative technologies, such as artificial intelligence, virtual reality, and new business models that can increase the competitiveness of Ukrainian hotels.

The international hotel industry is forecast to see annual revenue growth in 2024-2029, with revenues expected to increase by more than 20% in 2028. It was found that online sales will play an important role in hotel revenue, reaching 82% in the forecast year for 2028. The largest total revenue in the international market in 2024 is expected from hotels in the United States, China, Japan, the United Kingdom, and Germany. In North America, the market is expected to grow at 3.78% by 2028, while in Europe this figure will be 1.76%. The analysis of wages in different regions of the world showed significant differences: the United States, Canada, and Australia show the highest rates, while in Ukraine, Argentina, and Egypt the level of wages is low. In Ukraine, the hotel services market has suffered serious losses. In 2022, the volume of services sold decreased by 30% compared to 2020, and hotel businesses suffered losses in the amount of UAH 6,526.76 million. The share of enterprises that received a loss reached 55.4%. The number of employees employed in this industry has significantly decreased, while energy and payment costs have increased significantly.

The investigation of successful practices in the global hospitality industry allows developing relevant cases for Ukraine, considering the realities of today. The transfer of many business processes to the virtual world is a trend that will continue to grow and develop, so businesses need to pay attention to the development of information technology and its widespread use in hotel operations. It was proved that the strategic development of the hotel industry will depend on the availability of highly qualified specialists. Therefore, it is important to cooperate with higher education institutions and hotel companies in developing educational programmes that integrate modern technologies and innovative methods of work in the industry. The prospect for further research of the hotel business is the study of foreign experience in managing enterprises, analysis and assessment of the prospects for implementing positive practices.

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CONFLICT OF INTEREST

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Готельний бізнес в контексті глобальних тенденцій

Анотація. Готельний бізнес відіграє важливу роль у розвитку економіки країни, оскільки забезпечує робочі місця, стимулює туризм і сприяє культурному обміну. У контексті глобальних змін, зокрема постковідного відновлення та військової агресії, його значення лише зростає. Актуальність дослідження стану і перспектив розвитку готельного бізнесу зумовлена значними змінами, що відбуваються у цій сфері та необхідністю адаптації до нових реалій. У 2024 році на міжнародному рівні спостерігається активне впровадження цифрових технологій і сталих практик, тоді як в Україні готельна індустрія стикається з унікальними труднощами, пов'язаними з безпековою ситуацією. Порівняння міжнародного та українського ринку готельних послуг дозволяє виявити ключові тенденції і виклики та розробити рекомендації для розвитку галузі. Мета статті – проаналізувати вплив глобальних подій на світову готельну індустрію, визначити основні тенденції і проблеми та запропонувати шляхи для покращення ситуації в українському готельному секторі. Методи дослідження включали аналіз статистичних даних, системний підхід, case-study, порівняння міжнародних і національних показників і практик, узагальнення, абстрактно-логічний метод та метод синтезу. Результати дослідження свідчили, що попри позитивну динаміку міжнародного готельного бізнесу, українська готельна індустрія зазнає значних труднощів через війну в країні. На фоні негативних тенденцій, успіх міжнародного готельного бізнесу обумовлений наявністю державних програм, підтримкою розвитку бізнесу, інвестиціями у нові технології та інновації. Для відновлення та розвитку українського готельного бізнесу важливо впроваджувати позитивні зарубіжні практики, зокрема – сталого розвитку, та адаптувати їх до реалій сучасного українського ринку. Практична цінність статті полягала в наданні рекомендацій для покращення ситуації індустрії гостинності України на ринку, адаптації до нових умов і використанні міжнародного досвіду для розвитку готельного бізнесу

Ключові слова: індустрія гостинності; міжнародний ринок послуг; криза; адаптування; сталий розвиток

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Features of implementation of ESG management criteria in Ukrainian agriculture in the context of global challenges and EU integration

Abstract. This study addressed the significance of implementing ESG (Environmental, Social, Governance) management criteria in Ukrainian agriculture in the context of integration with the European Union during wartime and post-war reconstruction, which is becoming increasingly relevant due to the requirements of sustainable development and environmental protection, which are becoming an integral part of accession agreements. The purpose of this study was to substantiate the necessity of implementing ESG management criteria in the activities of Ukrainian agricultural enterprises to ensure sustainable development and integration of Ukraine into the EU during the period of martial law and post-war reconstruction. The key methods used included comparative analysis, evaluation method, SWOT analysis, and data synthesis. The aspects of environmental sustainability, social responsibility, and corporate governance and their interrelationships with the development of agriculture and rural areas in Ukraine were considered in detail. The study identified the value of environmental sustainability in the context of current challenges, such as climate change, soil degradation, and the need to preserve biodiversity, accommodate social aspects, ensure decent working conditions, develop rural communities, and improve the quality of life of the population through the implementation of responsible finance principles. The study identified strengths, weaknesses, opportunities, and threats that may arise on the path towards implementing ESG criteria in the management of agricultural enterprises through a SWOT analysis. Strengths include Ukraine's natural potential, fertile land, and agricultural traditions. Weaknesses include insufficient infrastructure, financial resources, and technical support. Opportunities include integration into European markets, attracting foreign investment, and developing

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innovative technologies. Threats include the impact of climate change, geopolitical risks, and economic instability. The above analysis of the benefits of ESG criteria for the agricultural sector has its practical value, as it can help agricultural enterprises improve their production potential, increase their competitiveness in the market, and become potentially attractive to investors

Keywords: reconstruction; principles of responsible finance; management; sustainable development; decision-making; social responsibility

INTRODUCTION

Implementation of strong environmental and social standards in line with European requirements is a prerequisite for Ukraine's integration into the European Union (EU) and attraction of international investment. This will enable the Ukrainian agricultural sector not only to resume its operations after the war, but also to become a competitive international player, as compliance with EU standards opens access to European markets and creates opportunities for financial support that will help ensure the long-term sustainability of economic development, reduce the adverse environmental impact and improve the quality of life of the population in the post-war reconstruction of Ukraine.

The reports of the Intergovernmental Panel on Climate Change (IPCC) clearly outline the situation (AR6 synthesis report, 2023). The intergovernmental body IPCC of the United Nations disseminates information on climate change caused by human activity, informs governments about the state of these changes, including natural, economic, and social impacts and risks. The UN Department of Economic and Social Affairs publishes the Global Sustainable Development report (2023). It highlights the key transformations necessary in various sectors and contains key findings from various sources, practical examples, and tools for progress towards the Sustainable Development Goals. According to the conclusions of the IPCC, human-induced impacts are leading to critical changes in ecosystems, which cause severe economic, social, and environmental risks (AR6 synthesis report, 2023). These changes are critical to understanding how adapting agriculture to new environmental conditions can increase its resilience. The UN's Global Sustainable Development report (2023) also highlighted the need for transformation in various sectors, including agriculture, to achieve the Sustainable Development Goals. Thus, the report contains practical examples and tools that can be used to promote the integration of ESG (Environmental, Social, Governance) criteria in agriculture.

The academic community has been actively researching the impact of ESG criteria on the development of the agricultural sector in different countries. N.F. Takril *et al*. (2023) concluded that ESG considerations can positively affect financial performance by increasing operational efficiency, improving the reputation of enterprises, and attracting sustainable investment. They also noted that transparency in corporate reporting increases investor confidence, which helps to increase investment in agriculture. In the context of Ukraine's post-war reconstruction, V. Metelytsia & T. Gagalyuk (2024) argued that small and medium-sized agricultural enterprises are the most flexible in implementing ESG criteria, as their operating structure allows them to adapt new approaches to resource management more quickly. This has also increased their competitiveness in markets with high environmental requirements. The researchers emphasised that attracting international investors is only possible if companies meet ESG requirements, which is becoming a crucial aspect in the recovery of the Ukrainian agricultural sector.

M. Kirzhetska & Yu. Kirzhetskyy (2022) showed that the integration of ESG criteria helps to increase the return on assets of enterprises, which makes them more attractive to investors. This study confirmed that the implementation of ESG strategies helps to improve the financial performance of companies, as investors are increasingly paying attention to the environmental and social aspects of business when making investment decisions. This approach helps to increase the efficiency of resource use and attract capital. D. Zatonatskiy (2023) investigated the prospects of ESG investment in the rebuilding

of Ukraine's critical infrastructure after the war, emphasising that international investors are actively supporting projects related to the restoration of agricultural enterprises, especially those that implement environmentally friendly technologies and socially responsible management approaches. This study has demonstrated the potential to attract large investments in Ukraine's agricultural sector through the implementation of ESG approaches. The researcher also noted that companies that adhere to ESG principles have better opportunities to attract international loans and grants, which can be a valuable tool for their development in an unstable economy.

T. Mirzoyeva & N. Gerasimchuk (2023) noted that in the conditions of the 21st century, when business conditions are rapidly transforming and the level of risks is constantly increasing, agribusiness representatives should carefully approach risk assessment and correlate the results with the principles of ESG strategy, as well as general business management. For Ukrainian agricultural producers, which are forced to operate under martial law and, accordingly, experience a lack of resources and disruption of logistics, integration into the risk management system and implementation of the principles and criteria of the ESG strategy by the enterprise may become a new vector of development, the significance of which is the purpose of this study. In the context of sustainable development and Ukraine's integration into the EU during the period of martial law and post-war recovery, the objective of the study was to substantiate the ESG criteria in the management of agricultural enterprises through the use of SWOT analysis, identification of threats and opportunities, strengths and weaknesses of ESG strategies during a full-scale invasion, considering Ukraine's European integration transformations.

MATERIALS AND METHODS

The present study employed a combination of methods to analyse the feasibility and significance of implementing ESG criteria in Ukrainian agriculture. The comparative analysis method was employed to study in detail the implementation of ESG criteria in agricultural enterprises in Ukraine and the EU. It helped to identify key differences and similarities in the approaches to environmental, social, and governance aspects of agriculture between these regions. The study used Stakeholder theory (n.d.) to help explain how organisations consider the interests of individuals or groups affected by their actions. The study reviewed a wide range of international materials, including research by leading European academic institutions and reports by the European Commission, which analyse achievements in sustainable development and the implementation of environmental standards in EU countries. The sources were used to explore the best practices of European agricultural enterprises that have already implemented ESG criteria and demonstrated the effectiveness of these measures in practice (EU agri-food trade..., 2024).

In the context of Ukraine's integration into the EU, the introduction of ESG criteria in agriculture is essential for increasing the competitiveness of Ukrainian enterprises in the international market. A detailed study of the practices of EU countries can serve as an effective basis for developing suitable recommendations for the implementation of these standards in Ukraine. The comparative analysis identified the key challenges faced by Ukrainian agricultural enterprises in implementing ESG criteria, including limited funding, regulatory barriers, and the need to modernise production processes. The assessment methodology included data analysis through a holistic approach and detailed analysis of a wide range of data from various sources. One of the key sources of information for assessing the impact of ESG criteria on Ukrainian agriculture was statistical data obtained from the State Statistics Service of Ukraine (n.d.). The data enabled the assessment of economic indicators of agriculture at the national level, including the productivity of enterprises, the level of employment in the sector, and the volume of agricultural production.

These data allowed for a detailed analysis of the economic situation in the agricultural sector, which helped to identify key trends and challenges faced by agricultural enterprises in the current crisis. Additionally, data from the Ministry of Agrarian Policy and Food of Ukraine was instrumental in identifying government initiatives and regulations in the agricultural sector, particularly in the implementation of sustainable

practices (Crop production..., 2024). The study was also based on data from the Kyiv School of Economics, which conducted in-depth research on the impact of the war and martial law on the Ukrainian economy and the agricultural sector (The explosion..., 2023; Neiter *et al.*, 2024). The analysis of these data helped to determine how the war affected production capacity, export opportunities, and the overall economic stability of agriculture, and to analyse key areas for the recovery of the agricultural sector after the end of the conflict, as well as possible scenarios for the development of agriculture in the wartime and post-war periods. International sources, such as the reports of the IPCC (AR6 synthesis report, 2023) and Food and Agriculture Organization (FAO) (Climate-smart agriculture, n.d.) provided valuable information for assessing the climate indicators and environmental challenges faced by Ukrainian agriculture. The data from these sources allowed for an assessment of how climate change is affecting crop yields, water availability, and other major environmental factors. This helped to develop recommendations for adapting agriculture to climate change through the implementation of sustainable practices and ESG criteria. The SWOT analysis was applied to identify the strengths and weaknesses of the implementation of ESG criteria in agriculture (internal factors), as well as opportunities and threats (external factors).

The synthesis method was employed to summarise data from various sources, which provided a holistic understanding of the state of Ukrainian agriculture and its readiness to implement ESG criteria. The synthesis method was also used to identify the state of research on the impact of changes in the management of agricultural enterprises since the reorientation to ESG criteria in the EU. Additionally, the study examined the Directive of the European Parliament and of the Council No. 2014/95/EU (2014), which regulate sustainable development and disclosure of non-financial and diversity information, obliging large companies that are of public importance to publish non-financial reports. These reports included information on environmental, social, and human resources issues, respect for relevant human rights, anti-corruption actions, and governance issues.

EU reporting on environmental, social, and governance issues has become increasingly important since 2016, when the Paris Climate Agreement was ratified (Law of Ukraine No. 1469-VIII, 2016). It served as a tool for assessing companies' compliance with sustainability standards, which is a key factor for investors and other stakeholders. For countries seeking integration into the EU, the implementation of these reports has become not only a requirement of the times, but also a prerequisite for achieving European business standards starting in 2025 (Takril *et al.*, 2023). That is, the study is based on a wide range of methodological tools, which enabled a thorough assessment of the benefits of implementing ESG criteria and the development of recommendations for their integration into the agricultural sector of Ukraine and, specifically, into the management of agricultural enterprises.

RESULTS AND DISCUSSION

According to the IPCC, human activity, mainly through greenhouse gas emissions, has caused global warming, with the Earth's surface temperature rising by 1.1°C between 1850 and 2020. Thus, global greenhouse gas emissions are accelerating. This is caused by unstable energy use, land use, lifestyles, and consumption and production patterns in regions, between countries, and within them (AR6 synthesis report, 2023). It was argued that various measures are being implemented around the world to prevent further temperature increases and reduce greenhouse gas emissions. Through the signing of various international initiatives and agreements, agricultural companies are implementing the UN Sustainable Development Goals (n.d.), which aim to help companies and enterprises develop without adversely affecting the environment and while maintaining the stability of social and cultural systems.

It was found that there are governmental and commercial proposals that help to transition to the principles of sustainable development through financial instruments. For example, the FAO's Climate-smart agriculture (n.d.) programme aims to increase the resilience of agriculture to climate change, particularly through precision agriculture and natural resource

management. There are also various funds, such as the Green Climate Fund (n.d.), which aim to finance projects that contribute to reducing greenhouse gas emissions and adapting to climate change, including in agriculture. At the same time, various types of non-financial management reports of companies, including environmental, economic, and social components, emphasise the determination to act and responsibility for food security and society at large.

It was found that Ukraine is a top player among producers and suppliers of agricultural products in Europe. In 2023, the country ranked third among the EU's largest exporters with EUR 11.8 billion, accounting for 7% of EU imports and playing a significant role in the implementation of the UN Sustainable Development Goals. However, due to the active hostilities, the agricultural sector has suffered tremendous losses and destruction, affecting the welfare and lives of Ukrainians. During the war, Ukrainian companies (most of them) operate at a loss, but are trying to introduce new management approaches to support the country's economy and wartime society (Ukrainian agriculture..., 2023). The study found that to boost European investment, it is increasingly necessary to introduce and implement sustainable development goals, and the introduction of ESG management criteria may be most suitable for transforming the agricultural sector.

ESG criteria is a set of criteria used to assess a company's performance in three key aspects and is a valuable source of information for investors to assess the company's sustainable development indicators, identify risks, and evaluate long-term growth potential. It was found that the ESG complex can be divided into three aspects. *Environmental aspect* focuses on the company's impact on the environment and includes an assessment of the consumption of natural resources, such as water, energy, and raw materials. The analysis of greenhouse gas emissions and their adaptation for further use is a vital element of the environmental criterion (Kovalenko *et al*., 2021), and companies that use it strive to minimise the amount of waste that goes to landfills (Green Climate Fund, n.d.; Lagodiyenko *et al*., 2024). It was also found that the use of biomass reduces the amount of waste in agriculture and, in the case of biogas, leads to the return of biodiversity and overall environmental improvement (Bielik *et al.*, 2024). In contrast to the environmental aspect, *the social aspect* reflects the company's interaction with its stakeholders, such as employees, consumers, and the community, and covers equality issues, including gender issues, as companies strive to provide equal opportunities for all employees, regardless of their gender, race, age, or other characteristics. It was found that another major aspect is the creation of an inclusive working environment where each employee feels valued and can develop professionally, as labour standards are also a critical element of the social aspect (ensuring fair working conditions, occupational safety, social protection, etc.). At the same time, *the governance aspect* considers the principles of corporate governance in a company, including the structure of the board of directors, ethical standards, internal control, and risk management, as sound corporate governance contributes to the effective functioning of the company and increases investor confidence. It was found that the structure of the board of directors should ensure a balance in the management of business processes, which would allow for objective and balanced decisions, as ethical standards include adherence to the principles of honesty, transparency, and responsibility in business activities. Companies should have clear policies to prevent corruption, conflicts of interest, and other misconduct.

The study found that internal controls help ensure that a company's operations and processes follow established standards and regulatory requirements. This includes conducting regular audits, monitoring and assessing risks, and implementing mitigation measures (What is ESG..., 2024). The development of managerial responsibility is crucial because, apart from transparency to the state, it also contributes to the economic development of the business itself, as job creation increases trade and company profits, while financing start-ups helps to find business partners, which ultimately helps to generate economic benefits (Tiurina *et al*., 2021). The implementation of ESG criteria contributes to the development of responsible business and helps companies attract investors who focus

on sustainability indicators when making investment decisions. Companies with solid ESG ratings have better access to capital, reduced risks, and increased trust from customers and partners, while companies that have already integrated ESG principles into their operations have a competitive advantage because they can adapt to new requirements faster and avoid possible fines and sanctions. The study showed that with the beginning of the full-scale invasion, Ukraine's European integration processes gained new relevance and intensity, which led to the granting of candidate status for EU membership on 23 June 2022 (Ukraine receives..., 2022). The granting of the status meant that Ukraine now had to work especially hard to quickly bring all aspects of its policies and legislation in line with EU norms and rules (Starikova, 2022). It was argued that Ukrainian agricultural policy and national legislation regulating agricultural activities and food production play a significant role in this process.

The study noted that Ukraine, due to its fertile soils, favourable climate, and favourable geographical location, is one of the leading exporters of grain crops, sunflower oil, sugar, as well as meat and dairy products (The impact of Russia's war..., 2023; Kamakaula, 2024). Agriculture has always been a major part of the economy, providing a sizeable share of GDP and jobs (Table 1).

Table 1. GDP structure in Ukraine in 2018-2022, %

Sector	2018	2019	2020	2021	2022
Agriculture	10.1	9	9.3	10.9	8.2
Trade	13.2	13.2	13.9	13.6	12.4
State Social Insurance Administration	6	6.7	7.3	6.2	21.1
Education and Healthcare	6.6	6.7	7.1	6.8	6.6
Construction	2.3	2.7	2.8	2.8	1.2
Utility services	3.5	3.5	3.3	3.7	4.8
Processing industry	11.5	10.8	10.1	10.3	7.6
Extractive industry	6	5.6	4.6	6.4	5.7
Other services	25.5	27.8	27.5	25.3	20.7

Source: compiled by the authors based on data from Gross domestic product for 2022 (2023) and State Statistics Service of Ukraine (n.d.)

The study provided evidence of the above theses on agribusiness development through examples of investments in the industry in 2015-2022 (Fig. 1).

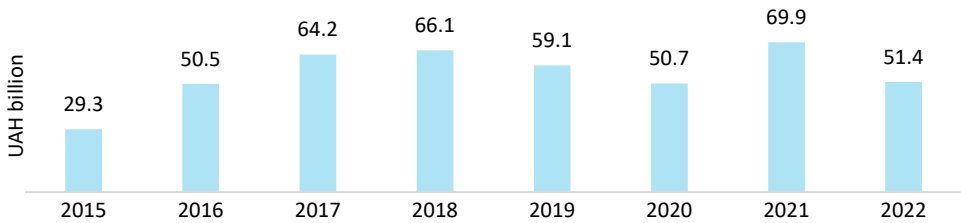

Figure 1. Capital investments in agriculture, forestry, and fisheries, 2015-2022, UAH billion
Source: compiled by the authors based on data from the State Statistics Service of Ukraine (n.d.)

In 2021, capital investments in agriculture, forestry, and fisheries amounted to UAH 69.95 billion, which is 26% greater than in 2022 (UAH 51.44 billion), according to the State Statistics Service of Ukraine (n.d.). Due to the war, investments declined to the level of 2020, with domestic companies focusing more on internal and external investments rather than on state support as in EU countries. This helped the industry to survive financially in 2022 and be more flexible. Since 2022, the Ukrainian agricultural sector has suffered tremendous losses due to the full-scale invasion. According to the Kyiv School of Economics, the total losses after the large-scale invasion amounted to USD 10.3 billion, with Zaporizhzhia, Kherson, and Luhansk regions suffering the most (Neiter *et al*., 2024). Under these conditions, monthly costs, despite the losses, are increasing due to internal market conditions, as the key factors of negative changes for agriculture are rising production prices, restrictions in logistics routes, and reduced supply volumes (Fig. 2).

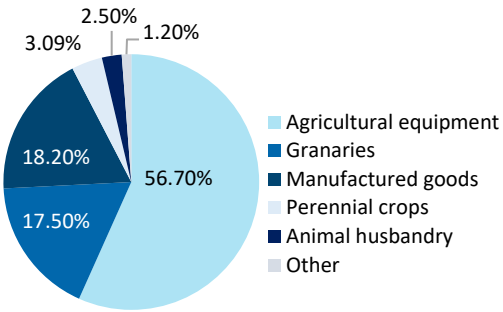

Figure 2. Breakdown of agricultural losses by category

Source: compiled by the authors based on data from R. Neiter *et al.* (2024)

According to the Ukrainian Agribusiness Club, despite lower production costs and improved logistics, grain production in 2023 was largely unprofitable (Crop production..., 2024). The primary reasons for this were low global grain prices and high competition on international markets. Low prices meant that even with reduced production costs, farmers were unable to achieve profitability. Another factor that contributed to grain losses was a decline in investment in advanced technologies and machinery, and a lack of funding, particularly for tractors, combines, drones, and precision farming systems (The new era of ESG..., 2023).

The situation with oilseeds was better. Sunflower cultivation had insignificant losses, while soybeans and rapeseed brought a small profit, as oilseeds have a higher added value compared to grains, which allows for higher revenues at unstable prices (The new era of ESG..., 2023). It was found that the profitability of grains and oilseeds increased in 2023 compared to 2022, but low international market prices did not allow the industry to achieve considerable profitability. Apart from economic challenges, Ukraine's agricultural sector faced major environmental problems. Military operations in the country have led to extensive contamination of agricultural land, with 156,000 square kilometres of landmines, including agricultural areas, as of mid-2024, greatly hampering field cultivation and sowing (Humanitarian demining of Ukraine..., n.d.). Destroyed military equipment releases heavy metals, explosives, and combustion products that enter the soil and water resources. These processes adversely affect future yields and product quality. The weapons left in the fields not only render cultivation impossible, but also endanger the lives of employees, destroy crops, and deteriorate the situation in the region (Ukraine: The impact..., 2024).

All these factors seriously affect both the social and economic development of the agricultural sector: lower incomes, lower quality of life, job losses, environmental pollution, and increased health problems. The explosion of the Kakhovka HPP caused at least $2 billion in direct damage (2023) to Ukraine. Damage to infrastructure, flooding of agricultural land and settlements led to major economic losses, the recovery of which requires extensive financial resources and time, further complicating the recovery of the agricultural sector and the country's economy overall (Neiter *et al*., 2024), thus highlighting the relevance of implementing ESG criteria (Table 2).

Table 2. SWOT analysis of ESG criteria implementation in the management of agricultural enterprises

Strengths	Weaknesses
1) Reputation improvement: • implementation of ESG criteria improves the reputation of agricultural companies among consumers, partners, and investors; • companies with a sound ESG rating are perceived as more responsible and reliable, which helps to increase trust and loyalty. 2) Efficiency improvement: • compliance with environmental standards can lead to lower energy and resource costs; • optimisation of waste management and implementation of eco-technologies contribute to increased production efficiency. 3) Access to financing: • investors are increasingly paying attention to ESG indicators when making investment decisions; • companies with strong ESG ratings have better access to preferential loans and investment funds.	1) High initial costs: • implementation of ESG criteria may require considerable initial investments in advanced technologies and infrastructure; • the costs of staff training and adapting internal processes may be extensive. 2) Complexity of compliance with standards: • compliance with ESG standards may require complex and ongoing monitoring and reporting activities; • the lack of clear national standards and regulatory requirements may complicate the implementation and future development of ESG standards.
Opportunities	**Threats**
1) Expansion of sales markets: • companies that have implemented ESG criteria can access new markets where environmental and social standards are valued by consumers; • increased export potential of products certified according to ESG standards. 2) Business resilience improvement: • implementation of ESG principles and criteria helps to reduce the risks associated with environmental disasters and social conflicts; • improved resilience to climate change and external economic shocks. 3) Innovations and development: • implementation of ESG criteria stimulates the development of advanced technologies and innovations, which contributes to the overall development of the industry; • attraction of investments in research and development aimed at improving the sustainability and efficiency of production.	1) Competition and uneven playing field: • companies that implement ESG criteria may face competitors that do not adhere to such standards and may offer products at lower prices; • lack of a level playing field in the market may reduce the competitiveness of companies investing in sustainability. 2) Risks of regulatory changes: • uncertainty in the regulatory environment may create risks for companies implementing ESG criteria; • changes in legislation or the introduction of new requirements may increase compliance and adaptation costs. 3) Economic challenges: • economic instability and fluctuations in agricultural prices may affect companies' ability to invest in ESG initiatives; • pandemics, wars, and other global challenges may reduce the priority of sustainable development compared to business survival.

Source: compiled by the authors

SG criteria outlined in the SWOT analysis will help improve the economic and environmental situation not only for concrete regions affected by the hostilities, but also for Ukraine overall. The implementation of ESG criteria is a key factor in improving the environmental situation and restoring natural resources in the regions affected by military operations. It was noted that severe environmental damage, particularly soil, water, and air pollution, requires immediate action. It was suggested that integrating environmental standards into the activities of agricultural enterprises would be a significant step, which would enable more efficient management of natural resources, reduce greenhouse gas emissions, and contribute to environmental remediation. Particular attention should be paid to the restoration of agricultural land and the introduction of renewable energy sources such as solar panels, biogas units, and wind farms. This will not only reduce the carbon footprint of the agricultural sector, but also create conditions for energy independence at the enterprise level.

The study found that the social aspect of ESG will contribute to the restoration of communities and improve the quality of life in rural

areas, as the hostilities have contributed to the destruction of social infrastructure and affected the economic stability of communities. Creating new jobs, ensuring fair working conditions, and supporting local initiatives are crucial elements of rebuilding the social structure. It was noted that companies can contribute to the development of social infrastructure by investing in the construction of schools, hospitals, roads, and other facilities, which will substantially affect the economic growth of the regions. It is also vital to support the development of small and medium-sized enterprises, as they are the backbone of the local economy. It is also expected that the integration of ESG criteria will minimise financial, operational, and environmental risks, which will contribute to the long-term stability of the business, as transparency in reporting, business ethics, and adherence to the principles of corporate social responsibility increase the trust of investors, partners, and consumers. Companies that implement effective internal control and audit systems are better equipped to identify and eliminate problems, while maintaining reliable market stability.

Having analysed the significance of ESG implementation in agriculture, the opinion of I.O. Makarenko (2023) can be agreed with, who noted that disclosure of information related to ESG criteria can bring considerable benefits to Ukrainian companies, helping them to identify and manage risks and opportunities, improving their long-term financial performance and sustainability. W. Fang (2024) valuable study confirmed that ESG disclosure plays a significant role in increasing enterprise value. Disclosing a company's environmental, social, and governance performance can build investor confidence, mitigate the risks associated with uneven knowledge distribution, and thus increase a firm's reputation and value.

At the same time, O. Lagodiyenko (2022) emphasised that the efficiency of the corporate sector in the modern world is associated with obtaining a cumulative effect at the level of business structures, which determines the company's ability to increase its competitiveness by adhering to ESG principles. The researcher noted that compliance with ESG requirements is crucial for the entire chain of business relations. Companies that form part of the business chain, take part in it, but do not follow these requirements, have been excluded from the system, even despite their solid business performance. I. Gernego *et al.* (2024) confirmed that the development of ESG projects at the international level is leading to the emergence of increasingly specialised financial practices and instruments aimed at supporting private initiatives to combat climate change. In other words, development and support in this area will only grow, and future recovery will require new management methods. One can also agree with the researchers' opinion that the fundamental feature of ESG investing is its ability to create added value through environmental, social, and governmental impacts.

International global rankings demonstrate ESG investment trends across national economies, regions, and industries. Implementation of ESG criteria is not only an environmental necessity, but also an important fact for increasing the competitiveness and financial sustainability of agricultural enterprises. S.H.M. Radzi *et al.* (2023) shared this view and suggested that companies that fully understand and focus on sustainability can identify risks that may not have been previously identified. On the other hand, companies with more effective ESG practices will have more access to financing and efficiency improvements, resulting in cost savings. Companies that support these initiatives can overcome competitive obstacles as ESG gains market traction, which will benefit organisations as it can exceed consumer expectations while building resilience and sustainability in the long term.

According to the Stakeholder theory (n.d.), a company should consider the needs of all its stakeholders, including the environment, communities, and employees, rather than just focusing on increasing shareholder wealth. Since this theory assumes that companies actively assess and address ESG issues, it follows that the theoretical link between ESG and corporate performance that can develop is long-term value creation. According to A. Clément *et al.* (2022), the factual ESG performance is best suited to estimate the probability that an organisation will exist in the future. This allows for a broader analysis to be made for effective management

decision-making. This was predicted by O. Lagodiyenko (2022), I.O. Makarenko (2023), and W. Fang (2024). It is vital that further research also examines the impact of ESG criteria on the economic stability of rural communities.

It is especially relevant to investigate how ESG can contribute not only to the recovery of agricultural enterprises, but also to the sustainable development of rural areas. Considering the challenges associated with full-scale invasion, ESG criteria can become one of the key tools for achieving Ukraine's economic sustainability at the international level. The present study argued that reporting as an assessment of the implementation of environmental, social, and governance criteria increases the level of trust in the company, both on the part of investors and the state. The study concurred with the opinions of the above-mentioned researchers, as the Ukrainian business environment needs to create clear and transparent mechanisms that will help to convey the significance of implementing ESG criteria to large, medium-sized, and small companies.

CONCLUSIONS

Implementation of ESG criteria is critical to ensure the sustainability and competitiveness of Ukrainian agricultural enterprises in the context of integration into the EU. ESG strengths include Ukraine's natural potential, the reputation of agricultural companies among consumers, partners, and investors, and companies with a solid rating are perceived as more responsible and reliable, which helps to increase trust and loyalty. Weaknesses include inadequate infrastructure, lack of clear national standards and regulatory requirements, which complicates the implementation and future development of ESG standards. The study identified opportunities, including attracting investment, increasing the export potential of products certified according to international ESG standards, and threats that may hinder the implementation of the criteria (economic instability, climate change, the impact of volatility in agricultural prices, and the ability of companies to invest in initiatives, etc.)

Compliance with environmental, social, and governance standards helps agricultural companies improve resource efficiency, optimise internal processes, and reduce their adverse environmental impact. Particular focus should be placed on managing natural resources and reducing greenhouse gas emissions, which contributes to sustainable agriculture. ESG criteria are not only an environmental and social standard, but also a vital element of corporate governance. Companies that actively implement transparent reporting and risk management systems gain considerable competitive advantages in international trade, which plays a key role in integrating Ukraine's economy with the international market, as investors and partners increasingly rely on sustainability indicators when making investment decisions. Despite the significant upfront costs associated with implementing ESG, the long-term benefits include access to new markets, the ability to attract international investment, and improved reputation. This is of particular relevance for the recovery of war-affected regions of Ukraine, where environmental and social sustainability will contribute to faster recovery under conditions of sustainable business and entrepreneurial development. The issue of ESG implementation is new to the Ukrainian agricultural sector and requires further research to explore the adaptation of these criteria to local conditions, as well as to develop practical tools for effective implementation in multiple segments of the agricultural sector.

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CONFLICT OF INTEREST

None.

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Особливості впровадження управлінських критеріїв ESG у сільському господарстві України в контексті глобальних викликів та ЄС інтеграції

Анотація. Стаття присвячена важливості впровадження управлінських критеріїв ESG (Environmental, Social, Governance) в сільське господарство України в контексті інтеграції з Європейським Союзом у воєнний час та період повоєнного відновлення, що набуває актуальності у зв'язку з вимогами сталого розвитку та збереження навколишнього середовища, котрі стають невід'ємною частиною вступних угод. Метою дослідження було обґрунтування зазначеної важливості впровадження управлінських критеріїв ESG у діяльність сільськогосподарських підприємств України для забезпечення сталого розвитку та інтеграції України в ЄС у період дії воєнного стану та післявоєнної відбудови. Основними методами стали порівняльний аналіз, метод оцінки, SWOT-аналіз та синтез даних. Детально розглядалися аспекти екологічної стійкості, соціальної відповідальності та корпоративного управління і їх взаємозв'язки з розвитком сільського господарства та сільської місцевості в Україні. Проведене дослідження визначило важливість екологічної стійкості в умовах сучасних викликів, таких як: зміна клімату, деградація ґрунтів та необхідність збереження біорізноманіття, врахування соціальних аспектів, забезпечення гідних умов праці, розвиток сільських громад та підвищення якості життя населення за рахунок впровадження принципів відповідального фінансування. Дослідження через проведений SWOT-аналіз ідентифікувало сильні та слабкі сторони, можливості та загрози, які можуть виникнути на шляху впровадження ESG-критеріїв в управління сільськогосподарськими підприємствами. До сильних сторін належать природний потенціал України, наявність родючих земель та традиції сільського господарства. Слабкі сторони включають недостатній рівень інфраструктури, фінансових ресурсів і технічної підтримки. Можливості пов'язані з інтеграцією до європейських ринків, залученням іноземних інвестицій та розвитком інноваційних технологій. Загрози включають вплив кліматичних змін, геополітичні ризики та нестабільність економічної ситуації. Поведений аналіз переваг критеріїв ESG для аграрного сектору має свою практичну цінність, адже здатен допомогти сільськогосподарським підприємствам поліпшити виробничий потенціал, підвищити конкурентоспроможність на ринку та стати потенційно привабливими для інвесторів

Ключові слова: відбудова; принципи відповідального фінансування; управління; сталий розвиток; управлінські рішення; соціальна відповідальність

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Organisation of labour remuneration during grain harvesting in agricultural enterprises

Abstract. Modernisation of scientific recommendations on remuneration of labour for harvesting grain crops in enterprises is relevant, as it can potentially contribute to higher yields, higher gross harvest, and labour income of employees, reduction of losses and improvement of grain quality, and more efficient use of technical and human resources. The purpose of this study was to substantiate the scientific principles of organising labour remuneration for grain harvesting in agricultural enterprises, considering the current changing conditions. The following methods were employed in the study: abstract-logical, monographic, statistical-economic, and systematic approaches. The study covered the organisational foundations for harvesting grain crops in enterprises, which begin with the formation of labour collectives and their technical support, work and rest regimes, and keeping a summary record of the working time of the personnel involved. The study established the regulatory aspects of labour remuneration regulation and application of

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the tariff scale, additional payments and allowances, and increase of tariff rates of remuneration for certain three categories of employees of enterprises engaged in grain harvesting: machine operators, drivers, and employees in receiving units. It was proved that remuneration for most employees in agricultural enterprises is formed based on the tariff system of remuneration, which fully ensures the differentiation and validity of wages depending on the quantity and quality of work performed. The study proposed the key methodological approaches to labour organisation and formation of the tariff scale and corresponding hourly wage rates for grain harvesting, which should be included as content in collective agreements, regulations on remuneration, and regulations on bonuses in agricultural enterprises. The current tariff scale offers the possibility of raising inter-grade coefficients to strengthen the incentive function of wages in grain harvesting. The study considered possible extra payments and allowances, bonus payments, which are recommended to be applied selectively to further stimulate the production staff of the enterprise to better quantitative and qualitative indicators of their work. The practical significance of the findings of this study lies in the possibility of their direct use in agricultural enterprises to provide financial incentives to production personnel for productive work in harvesting grain crops, on which the economic condition of farms largely depends

Keywords: salary; tariff system; production personnel; collective agreement; social and labour relations; agribusiness

INTRODUCTION

The cultivation and harvesting of grain crops at enterprises and subsequent processing of grain is of utmost importance for providing the population with basic and affordable food products (cereals, flour, bakery and confectionery products, etc.). Grain farming is a powerful segment of agribusiness in Ukraine, which largely determines the socio-economic development of rural areas and the country's food security, living standards and employment, providing processing companies with raw materials and livestock farming with feed. Having increased its gross grain production in recent decades, Ukraine has joined the world's top grain exporters, with demand for grain growing every year as the world's population grows and its purchasing power improves. The issue of rational labour organisation and financial incentives for employees during grain harvesting is a topical issue for every agricultural producer every year. Each season, it is necessary to consider the condition of grain crops, current yields, availability of technical, human, and service support, etc. Therefore, harvesting grain crops with the least losses and the best grain quality, as well as efficient use of technical and energy resources, will depend on the correct organisation of remuneration of production personnel at enterprises. These issues can be resolved through the development of the relevant scientific and methodological principles of labour remuneration in agricultural enterprises.

Many Ukrainian researchers have addressed the scientific substantiation of the areas of improvement of material incentives and labour remuneration organisation. Specifically, T. Oliinyk *et al.* (2024) studied labour motivation in agriculture and proposed ways to improve it, where the key role is played by the wage rate and the possibility of increasing it. The researchers found that a well-established material component of labour motivation will increase staff productivity and considerably affect the performance of agricultural enterprises. T. Kosova *et al.* (2021), having considered the procedure for regulating labour remuneration in the agricultural sector of the economy, proved the need to de-shadow labour relations and accounting and control support for the relevant wage payments, as well as the formation of a social package for staff to improve the motivational mechanism in agricultural enterprises. Scientific developments on labour remuneration in the agricultural sector of the economy were also the subject of attention of L. Marmul *et al.* (2024), who noted that labour productivity determines the efficiency of management, and therefore the wage rate, and therefore it is a crucial object of

accounting and audit. For this, each enterprise must have a personnel policy, rational planning and use of personnel, proper labour organisation, and regulation of labour relations.

T. Perevuznyk & V. Holovachko (2019), having identified the advantages and disadvantages of using different forms of remuneration, proposed to choose the relevant remuneration system in agricultural enterprises in a balanced manner, since to improve the mechanism of organising financial support for wage payments, it is necessary to carefully approach the organisation and regulation of labour, ensure collective bargaining, and respective trade union involvement. A. Kramarenko & M. Vyshnevska (2022) concluded that the use of a grade-based remuneration system will ensure objective differentiation of wages, develop a competitive and transparent compensation policy, and a close relationship between performance and remuneration. Such a remuneration system has proven to be an innovative approach to motivating employees, but it has not yet become widespread in agricultural enterprises.

At the same time, N. Monteiro & O. Straume (2024), analysing the relationship between the use of various management methods and remuneration in a large representative sample of Portuguese firms, concluded that the presence of trade union activities to regulate remuneration at the meso- and micro-level is a positive phenomenon, and companies with works councils are more likely to be committed to higher productivity and pay their staff equally. Furthermore, a significant role is played by the possibility of promoting highly efficient employees in firms and the corresponding increase in their wages. P. Zheng *et al.* (2024) proved the direct impact of consumer demand, investment demand, and labour mobility on agricultural wage growth in China. Furthermore, agricultural support policies also contribute to wage growth in the sector.

Greek researchers G. Giotis & N. Mylonas (2022), having analysed the results of theoretical and empirical studies by other academics, concluded on the absence of a substantial connection between the minimum wage and employment, and that the growth of the minimum wage does not significantly affect unemployment, etc. The findings of N. Thi (2021) are somewhat different. The researcher conducted a survey of workers in agricultural regions of Vietnam and identified the factors influencing employment policy on their wages, which are positively affected by the established minimum wage and the employee's professional level of education. According to the study by T. Habanabakize & M. Zerihun (2024) from South Africa, food imports, inflation, and real wages affect long-term changes in the number of people employed in agriculture. The researchers insist that the state agricultural policy should be aimed at import substitution to increase employment and wages in the sector.

These researchers have investigated labour motivation and remuneration at various enterprises, especially in the agricultural sector, without distinguishing technological processes, particularly in the production of crops: tillage, sowing, care, harvesting, etc. At the same time, insufficient attention has been paid to the study of organisational, economic, social, and labour features of remuneration in agricultural enterprises at critical stages of production technology. The purpose of this study was to establish the regulatory, methodological, scientific and practical principles of remuneration of personnel at a critical stage of production and to form the components of wages in agricultural enterprises.

MATERIALS AND METHODS

The research was conducted at the Ukrainian Research Institute of Agricultural Productivity (Kyiv) during the third quarter of 2024. The results of scientific developments of Ukrainian and foreign scientists, statistical data on wages in the sectors of the Ukrainian economy, operational data on agricultural enterprises, etc, were used. The calculations were processed using Microsoft Office computer software (spreadsheet editor). The minimum tariff rate of hourly wages for simple work in the industry was calculated based on the established minimum wage level in the country. Using intergrade coefficients, other tariff rates of remuneration for different types of work in agricultural enterprises were determined. The study reviewed and accounted for the regulatory provisions of the laws of Ukraine on the application of the tariff system of remuneration of labour (Law of Ukraine

No. 108/95-BP "On Payment of Labour", 1995), the current and projected levels of the minimum wage in the state (Law of Ukraine No. 3460-IX "On the State Budget of Ukraine for 2024", 2023; Decree of the Cabinet of Ministers of Ukraine No. 751 "On Approval of the Budget Declaration for 2025-2027", 2024). And the collective agreement regulation of social and labour relations, the procedure for differentiating the levels of basic wages of workers and specialists, as well as the list of extra payments and bonuses in agricultural enterprises (Law of Ukraine No. 3356-XII "On Collective contracts and Agreements", 1993; Branch agreements..., 2014). The methodological tools of the study included general scientific and special research methods, namely: abstract-logical (to substantiate the key points and conclusions); monographic (to consider the findings of other researchers in this area of study); statistical-economic (to build a series of dynamics, comparisons), systematic approach (to substantiate scientific and methodological recommendations for remuneration of labour during grain harvesting in enterprises), etc.

RESULTS AND DISCUSSION

It was found that the key criteria for material incentives for agricultural workers in the harvesting of grain crops are the indicators of prompt and high-quality harvesting, the level of yield achieved, gross harvest, completion of the seasonal task by the personnel, etc. It was found that harvesting grain crops in enterprises with minimal losses of agricultural products requires adjusting the organisation of labour of the production personnel involved. Specifically, it is necessary to start with organisational measures to form an efficient ratio of human and technical resources required for the planned volume of gross harvest of the relevant grain crops, and then to set up material incentives for the relevant personnel through the mechanism of remuneration for qualitative and quantitative performance indicators.

It was found that material incentives should provide the basis for the motivational mechanism of labour collectives in enterprises (institutions and organisations), which is based on the following principles: employees' wages have a minimum limit regulated by the state; increasing the role of contractual regulation of remuneration (collective agreements at the sectoral level and collective agreements in enterprises); payment of wages to employees is based on the results of labour expended, quantity and quality of products received. Therefore, the principal task of organising labour remuneration is to ensure an adequate combination of state and contractual regulation of labour remuneration in each enterprise. It was argued that the choice of the form, system, procedure of remuneration, etc., should be substantiated for certain types of work, categories of employees in enterprises, to ensure the link between wages and labour results (individual and/or collective). According to the legislation and business practices in the agricultural sector, the most common wage system in the economy is the tariff system, which is based on an assessment of the complexity of work and the qualifications of employees and includes: tariff scales, tariff rates, salary schemes, professional standards (qualification characteristics). It allows for differentiation of staff salaries based on the calculation of the tariff rate of a first-class worker (less energy-intensive work, simple unskilled labour), inter-qualification and inter-office ratios of tariff rates using differentiated coefficients (Law of Ukraine No. 108/95-BP "On Payment of Labour", 1995; Branch agreements..., 2023; Ivchenko *et al*., 2023b).

It was confirmed that employers determine the tariff categories according to the qualification characteristics (Ivchenko *et al*., 2023a), methodological recommendations for tariffication of work in the industry. Enterprises may also establish alternative remuneration systems, such as the grade system, which involves the assessment and construction of a grid matrix of job categories (grades) and their corresponding salary ranges – a "salary fork" – an innovative development in personnel management. However, due to its complexity and high staff turnover in agricultural enterprises, this development has not yet become widespread in the agricultural sector. It was found that for most of the personnel of agricultural enterprises, the hourly form of remuneration is applied using the classical six-grade tariff scale for remuneration of labourers and the scheme of official salaries for specialists, professionals, and managers.

Remuneration in agricultural enterprises is based on a tariff-based remuneration system that has not exhausted its capacity to differentiate and substantiate differing amounts of employee salaries depending on the quantity and quality of work performed. The piece-rate form of remuneration is used to pay wages to employees engaged in grain harvesting, as it is possible to ensure a direct quantitative link between wages and the tonnage of grain harvested per working day and the harvested area.

The use of piece-rate and/or time-based remuneration and related systems, the tariff scale and salary structure, the terms and amounts of various allowances, surcharges, bonuses, and the determination of remuneration rates for the relevant work are established by enterprises independently through social dialogue and compromise between the employer (owner or management) and the trade union organisation or representative of the enterprise's labour collective. If such an agreement is not concluded, these issues must be agreed upon with the trade union organisation or representative of the labour collective and approved by the employer's corresponding regulation (order, instruction, or provision). To calculate remuneration for grain harvesting, the norms and provisions of remuneration cannot be lower than those stipulated in the collective agreement concluded at the industry level. Thus, in agriculture, the last effective Sectoral Agreement was concluded in the summer of 2023 between the Ministry of Agrarian Policy and Food of Ukraine and the Trade Union of Agricultural Workers of Ukraine for 2023-2025. It stipulates that the minimum wage rate for a first-degree worker with normal working conditions, as the base wage rate for the formation of the wage scale (salary schedule for specialists), is at least 115% of the minimum wage, provided that the monthly (hourly) labour rate is met (Branch agreements..., 2023).

Starting from 2017 and until 2022, the calculation of the basic tariff rate for the first category of an employee of a simple job (profession) was based on the 115% increase in the subsistence minimum for able-bodied persons (Branch agreements..., 2014), which previously considerably limited the establishment of competitive wages in the industry and its differentiation among distinct types of work and professions in the workforce of agricultural enterprises. It was found that a positive phenomenon of social dialogue between the sectoral trade union and the central agricultural policy agency is the agreement on the intention to increase tariff rates and salaries of employees in the sector from 2023 owing to the fact that instead of the subsistence minimum, the minimum wage should now be used in the calculation of tariff rates and salaries. However, the most recent collective agreement, the Branch Agreement in Agriculture for 2023-2025, does not include the employers' side (Branch agreements..., 2023), although the provisions of the agreement are binding on all business entities in the agricultural sector that fall within the scope of the parties to the agreement.

Such an increase in minimum wage guarantees in agricultural enterprises should lead to an increase in the interest of the rural population and intensify employment in the agricultural sector of the economy. Therefore, having considered the key scientific approaches to the organisation of remuneration for grain harvesting in agricultural enterprises in 2024, in the following years, the minimum state and sectoral contractual remuneration guarantees should be observed to determine the salary for grain harvesting. Thus, the Law on the State Budget for 2024 approved the minimum monthly wage of UAH 8,000 starting from 1 April. In the next two years, it is likely to stay unchanged, as confirmed by the Budget Declaration for 2025-2027 adopted by the Government of Ukraine (Law of Ukraine No. 3460-IX "On the State Budget of Ukraine for 2024", 2023; Decree of the Cabinet of Ministers of Ukraine No. 751 "On Approval of the Budget Declaration for 2025-2027", 2024). If the minimum wage in Ukraine is increased in the coming years, it will be easy to make the relevant methodological calculations for the formation of the tariff scale of remuneration in agricultural enterprises, which are presented below.

It was found that the factual average monthly number of working hours in 2024 and hypothetically in 2025 will be higher than in peacetime, since there are no holidays during martial law. Therefore, in 2024, the fund of working hours without non-working (weekend) days for a five-day working week (40 hours per

week, 8 hours daily; days off - Saturday and Sunday) is estimated to be 2,096 h, in 2025 – 2,088 h (Debit-credit, 2024; Accountant, 2024). Thus, the average monthly number of working hours in 2024 will be 2,096 h / 12 mos. = 174.67 h, slightly less in 2025 – 2088 h / 12 mos. = 174.00 h. Starting from April 2024 and in the following years, the minimum guaranteed wage rate for a first-class worker in the agricultural sector will be UAH 9,200 per month (UAH 8,000×115%), or UAH 52.67 per hour (UAH 9,200 / 174.67 h) in 2024 and UAH 52.87 (UAH 9,200 / 174.00 h) in 2025. This is the amount of the minimum wage per month and the minimum wage rate for a first-class worker adopted for further calculations and differentiation of wages for distinct categories of workers in most agricultural enterprises (coverage is over 98% of the staff (Collections of the State Statistics Service of Ukraine, 2021). This will serve to form a tariff grid – the minimum guaranteed wage rates, for instance, for the planned year 2025 (Table 1).

Table 1. Minimum guaranteed hourly wage rates and coefficients of intergrade ratios for certain categories of agricultural workers in 2025, UAH/h

Categories of workers	Grades						*Minimum ratios of tariff rates by type of work performed to the tariff rate of a grade I worker*
	I	II	III	IV	V	VI	
Coefficients of inter-grade ratios	*1.00*	*1.09*	*1.20*	*1.35*	*1.55*	*1. 80*	*x*
On manual work in crop production	52.87	57.63	63.44	71.37	81.95	95.17	*1.00*
On manual work in animal husbandry	61.33	66.85	73.60	82.80	95.06	110.39	*1.16*
Mechanised work in crop production, earthworks, and road construction (by region): Group I (Steppe)	61.86	67.43	74.23	83.51	95.88	111.35	*1.17*
Group II (Forest-Steppe)	68.20	74.34	81.84	92.07	105.71	122.76	*1.29*
Group III (Polissia, Carpathian region)	75.08	81.84	90.10	101.36	116.37	135.14	*1.42*
Mechanised work in animal husbandry	61.86	67.43	74.23	83.51	95.88	111.35	*1.17*
Mechanised loading and unloading operations	56.04	61.08	67.25	75.65	86.86	100.87	*1.06*
Transport work performed by tractor units	56.04	61.08	67.25	75.65	86.86	100.87	*1.06*
Repair and machine tool work	56.04	61.08	67.25	75.65	86.86	100.87	*1.06*

Source: compiled and calculated by the authors of this study based on the Law of Ukraine No. 3460-IX "On the State Budget of Ukraine for 2024" (2023) and the Branch Agreements Regulating Social and Labour Relations in Agriculture for 2015-2025 (2023)

According to Table 1, the relevant types of work in the sector are directly related to the harvesting of grain crops at the enterprises. To calculate the tariff rates for all types of work and grades, the coefficients of the ratios by type of work and the coefficient of intergrade ratios are used. It was noted that mechanised work for tractor and combine drivers is divided into three groups in the tariff scale depending on the location of the enterprise. The principle was established that it is physically more demanding to work on soils in the northern and western regions of the state, and easier to work on soils in the southern and eastern regions (Branch agreements..., 2023).

It was argued that the agricultural sector has its specifics, which affects labour remuneration. At the same production costs, there is a possibility of obtaining different final results, which depends on soil fertility, the use of varietal material and fertilisers, natural and climatic conditions, and seasonality. Another specific feature of agricultural production is that a highly skilled worker must perform a variety of jobs that fall

into distinct categories and receive varying pay throughout the year. It was found that all these factors should be considered when organising the work process. Thus, to organise the harvesting of grain crops, it is necessary to define seasonal tasks for the formed crews of machine operators, which are developed based on the harvesting areas and terms, available harvesting and transport equipment (combines, trucks) and its productivity, yield and quality of grain, etc. Mechanic crews are formed based on their qualifications, seniority, experience, psychological compatibility, etc., and each crew is assigned a standardised task that can be adjusted during the harvesting campaign.

Crops can be harvested in one or two ways: direct or split harvesting. The first method (direct harvesting) involves harvesting upright and clean crops, with perennial grasses sown, as well as stunted and thinned crops that are not weed-free. The second method involves mowing the crops first, and then picking up the swaths and threshing them with self-propelled combines with a pick-up 2-7 days after mowing (Ivchenko *et al*., 2023b). It was found that to harvest grain crops in the most efficient terms with the technical base and human resources available, enterprises usually introduce summarised accounting of working time. The current Sectoral Agreement in Agriculture for 2023-2025 allows for the introduction of this measure in labour organisation, except in cases of work in hazardous conditions. In the case of summarised working time accounting, the duration of the accounting period (month, quarter, half-year, year) is set by the collective agreement of the enterprise. Work in excess of the normalised working hours in certain periods may be compensated for by shorter working hours in other periods or by providing extra days of rest within the accounting period. This allows reducing biological losses of grain crops in the fields from grain shattering through the use of extended work shifts for machine operators (combine harvesters), drivers, workers at the point of use (elevators, granaries), etc.

When negotiating and concluding a collective agreement, companies should agree on the list of production units and categories of employees who will work in the mode of summarised working time accounting, and for each unit and category of employees, the length of the accounting period should be specified. When establishing the accounting period (time standards), it is recommended to use the normative tables of working time duration, which are annually developed by the Ministry of Social Policy of Ukraine and posted on many information websites on HR and accounting issues (Debit-credit, 2024; Accountant, 2024). For example, in the section "Work and rest regime" of the collective agreement, it is recommended to stipulate that the annual summary working time record shall be used for the duration of the collective agreement for employees of the crop production shop, motor transport shop, repair shop, mechanised current, grain storage, etc. Time worked in excess of the normal working hours in the accounting period is paid as overtime (Branch agreements..., 2023). To create an incentivising level of wages in agricultural enterprises, it is worth considering their level in the different sectors of the economy. Thus, in June 2024, the average wage in agriculture was UAH 15.0 thsd, and in Ukraine – UAH 18.9 thsd (Table 2).

Table 2. Average monthly wages in Ukrainian industries

Indicator	Year				2024/2021, ±
	2021	2022	2023	2024*	
Subsistence minimum per 1 person for able-bodied persons per month, UAH	2,481	2,684	2,684	3,028	547
Minimum monthly salary, UAH	6,500	6,700	6,700	8,000	1,500
Minimum basic wage per month in agricultural enterprises according to the sectoral agreement, UAH	2,853	3,087	3,087	9,200	6,347
Average salary in Ukraine, UAH thsd	12.8	14.6	15.4	18.9	6.1
Including by industries: manufacturing	13.9	15.4	16.6	20.4	6.5
construction	9.8	10.7	10.1	14.6	4.8

Table 3, Continued

Indicator	Year				2024/2021, ±
	2021	2022	2023	2024*	
transport and communications	12.2	14.5	14.5	19.0	6.8
vehicle trade and repair	12.7	14.8	17.8	22.8	10.1
information and telecommunications	23.5	30.5	36.5	49.5	26.0
Financial and insurance activities	23.6	31.0	33.1	39.1	15.5
public administration, defence	15.9	17.6	19.1	23.4	7.5
science	17.6	20.9	20.9	26.3	8.7
education	10.8	11.4	11.1	12.6	1.8
healthcare	11.3	13.2	13.5	15.2	3.9
agriculture, forestry, and fisheries	10.0	11.9	12.3	15.0	5.0
As a % of the subsistence minimum per 1 person for able-bodied persons	403.1	443.4	458.3	495.4	92.3
As a % of the national minimum wage	153.8	177.6	183.6	187.5	33.7
As a % of the minimum wage in agriculture	350.5	385.5	398.5	163.0	-187.5
As a % of the average salary	78.1	81.5	79.9	79.4	1.2
As a % of the average salary in the industry	71.9	77.3	74.1	73.5	1.6

Note: as of 10 June 2024

Source: compiled and calculated by the authors of this study based on the State Social Standards (2024), Branch Agreements Regulating Social and Labour Relations in Agriculture for 2014-2020 (2014) and Branch Agreements Regulating Social and Labour Relations in Agriculture for 2015-2025 (2023)

The upward trend in agricultural wages in recent years, both in absolute terms and relative to the subsistence minimum, the national minimum wage and the minimum wage in agriculture, the average national wage and the average industrial wage, can be considered positive.

In addition, to guide the calculation of wages in a particular agricultural enterprise, it is necessary to consider its current size in the sectors of the economy and, through a balanced remuneration policy, to compete with other commodity producers in attracting the relevant personnel to the grain harvesting campaign. Thus, an analysis of the level of remuneration and the number of employees in agricultural enterprises of different sizes shows that the highest level of remuneration is observed in large (criteria: 251 employees and more, annual revenue over EUR 50 million) and medium-sized (51-250 employees, EUR 10-50 million) enterprises (Table 3).

Table 3. Wages and number of employees in enterprises and individual entrepreneurs in agriculture, forestry, and fisheries of different sizes

Indicator	Year				2022/2019, %
	2019	2020	2021	2022	
Salary, UAH	9,106.3	9,872.3	12,033.7	13,131.1	4,024.8
Wages and salaries, UAH large enterprises	12,814.3	14,509.7	16,652.2	17,970.0	5,155.7
medium-sized enterprises	8,748.5	9,664.9	12,243.9	12,770.1	4,021.6
small enterprises (excl. micro-enterprises)	6,548.2	7,089.4	8,479.3	10,227.4	3,679.2
micro-enterprises	3,889.7	4,149.7	4,332.1	5,339.3	1,449.6
Number of employees, thsd people – total	553.2	527.4	520.2	448.4	-104.8
Incl., %: large enterprises	7.8	7.3	8.3	7.7	-0.1 p.p.
medium-sized enterprises	54.5	52.7	50.6	51.7	-2.8 p.p.
small enterprises (excl. micro-enterprises)	22.7	24.0	24.2	25.0	-2.3 p,p,
micro-enterprises	15.0	16.0	16.8	15.6	0.6 p.p.

Source: compiled and calculated by the authors of this study based on the Collections of the State Statistics Service of Ukraine (2021) and the Collections of the State Statistics Service of Ukraine (2022)

However, medium-sized and small businesses (11-50 employees, EUR 2-10 million) employ more people. The criteria for micro-entrepreneurship are the number of employees – up to 10 people and annual income – up to EUR 2 million. When calculating piecework rates of remuneration for three major categories of workers in the grain harvest 1) machine operators (tractor drivers, combine harvesters); 2) truck drivers; 3) workers at grain receiving points (elevators) – more incentive payments should be applied compared to other categories of workers and to personnel in other sectors of the economy. It was found that this can be accomplished in three ways: 1) by increasing the tariff hourly rates of remuneration; 2) by establishing extra payments and allowances to wages; 3) by incentive payments (bonuses). In each particular enterprise, this can be handled individually by combining the above approaches.

The basis for calculating piecework rates is the hourly wage rates of different grades of the relevant work. For certain highly skilled employees engaged in particularly important and responsible work, collective agreements recommend that increased tariff rates (monthly salaries) be determined by intergrade coefficients with increased coefficients of up to 2.7 times the tariff rate of a grade I worker for the relevant type of work or profession (Branch agreements..., 2023). Therefore, when harvesting grain crops in enterprises, it is possible to differentiate the tariff rates of remuneration in 2025 as follows (Table 4).

Table 4. Example of calculation of the increased hourly wage rates for manual, mechanised and transport work during grain harvesting, UAH/hour

Categories of workers	Grades						*Minimum ratios of tariff rates by type of work performed to the tariff rate of a grade I worker*
	I	II	III	IV	V	VI	
Coefficients of inter-grade ratios	*1.00*	*1.34*	*1.68*	*2.12*	*2.46*	*2.70*	*X*
On manual work in crop production	52.87	70.85	88.82	112.08	130.06	142.75	*1.00*
Mechanised work in crop production, earthworks, and road construction (by region): Group I (Steppe)	61.86	82.89	103.92	131.14	152.18	167.02	*1.17*
Group II (Forest-Steppe)	68.20	91.39	114.58	144.58	167.77	184.14	*1.29*
Group III (Polissia, Carpathian region)	75.08	100.61	126.13	159.17	184.70	202.72	*1.42*
Transport work performed by tractor units	56.04	75.09	94.15	118.80	137.86	151.31	*1.06*

Source: compiled and calculated by the authors of this study based on the Law of Ukraine No. 3460-IX "On the State Budget of Ukraine for 2024" (2023) and the Branch Agreements Regulating Social and Labour Relations in Agriculture for 2015-2025 (2023)

Furthermore, it is recommended to increase wages in the first days of the mass harvest of any crops in enterprises, depending on their financial capacities, in the first days of the mass harvest. For example, it is recommended to pay tractor drivers and agricultural machine operators who perform variable labour rates for threshing grain crops in the first 10 days, and for mowing grain into swaths in the first 7 days of mass harvesting, at product rates increased by up to 60% (up to 30% if labour rates are not met), and other employees – by 15-30%, etc. (Ivchenko *et al.*, 2023b).

Such a considerable increase in the wages of agricultural production staff involved in grain harvesting takes place only for a relatively short period of time (approximately 2-4 weeks for most agricultural enterprises, depending on the area and types of crops), and therefore will not be an excessive cost factor in determining the cost of production. And considering that the grain will be of the best quality and will be stored and later sold, it should provide the corresponding financial income in the long run. Therefore, each year, it is worth analysing and comparing the amount of additional incentive payroll costs

with the cost estimate of the improvement in the quantitative and qualitative characteristics of the grain harvest. Such information will serve as a basis for applying certain incentive payments and their amounts for certain employees.

Proceeding from the tariff rates, labour standards, and terms of the collective agreement (provisions on remuneration and bonuses) adopted by the enterprise, it is recommended to establish two types of remuneration rates for products and work performed: per unit of output in tonnes and per unit of harvested area in hectares (in this case, 60-80% of the planned wages should be used to calculate the remuneration rate per tonne of grain harvested). Remuneration rates should be calculated before the start of the mass harvest, when it is possible to more accurately determine the yield of grain crops and, therefore, the seasonal labour rate for certain types of harvesting units, including through control threshing. This approach to remuneration will ensure that employees are not focused on the area harvested, but rather on achieving higher yields. To further incentivise staff to work productively during grain harvesting, it is planned to set various bonuses and allowances to the tariff rates of remuneration: 12% for labour intensity, 20% for high professional skills in grade V jobs, and 24% for grade VI jobs.

Tractor drivers of agricultural production of the first class are entitled to a guaranteed premium of 20%, of the second class – 10% of the tariff rate, drivers of motor vehicles of the first class – 25%, of the second class – 10% of the tariff rate (Branch agreement..., 2023). The classification of a machine operator is determined by a qualification commission established by order of the owner of the enterprise or its authorised body. The qualification characteristics of tractor drivers in agricultural production (by class of mechanic, requirements for their installation) are contained in the Handbook of Qualification Characteristics of Occupations "Agriculture and Related Services" (Ivchenko *et al.*, 2023a).

In the case of night work (from 10 p.m. to 6 a.m.), a supplement of 40% of the basic salary can be set, and in the evening (from 6 p.m. to 10 a.m.) – 20%. For example, a Class I mechanic working in the harvesting of winter wheat by direct combining with straw (Grade VI) in the Forest-Steppe natural zone in the Kyiv region, according to the tractor driver's record sheet, worked 80 hours, including 20 hours in the evening. His basic salary for this period in 2025 will be: UAH 14,731.20 (80 hours × UAH 184.14). Apart from the accrued remuneration at piecework or progressively increasing rates, it is recommended that the mechanic be paid the following surcharges and allowances 12% for intensity (14,731.20 × 0.12 = 1,767.74 UAH); 24% for high professional skills (14,731.20 × 0.24 = = 3,535.49 UAH); 20% for class (class I) (14,731.20 × × 0.2 = 2,946.24 UAH); 20% for working in the evening (20 hours × 184.14 × 0.20 = 736.56 UAH). According to the calculations, the extra wage will amount to UAH 8,986.03, or 61% of the basic wage, which is allowed and recommended during the crucial period of grain harvesting in agricultural enterprises.

The efficiency of work during grain harvesting largely depends on additional financial incentives. Apart from the previously mentioned extra payments and allowances, companies may establish other alternative types of incentive remuneration pursuant to the terms of a collective agreement. Specifically, an effective type of financial incentive is the establishment of added payments for exceeding shift work rates or seasonal production targets. The practice of incentives for meeting seasonal targets on time also proved to be effective: if the seasonal target is met at the level of 100-109% – the bonus to the employee's total earnings for harvesting grain crops can be set at 10%; 110-114% – 15%; 115-119% – 20%; 120% and more – 30%. (Ivchenko *et al.*, 2023b).

Agricultural enterprises, apart from the above types of extra remuneration, may apply bonuses for certain performance indicators, which should be regulated in the internal documents on remuneration and bonuses for staff. It is recommended that bonuses be paid to employees of agricultural enterprises at the expense of the wage fund based on the following criteria: prompt and high-quality performance of planned and/or operational work, instructions, orders, instructions; conscientious performance of official duties; significant achievements in work, high performance indicators, etc.

According to the approved bonus fund in the staffing tables of employees, bonuses (submitted by the heads of internal business units and approved by an enterprise order), considering the seasonality of work in crop production, are recommended to be paid at the following intervals: about 70% of the bonus fund should be distributed among employees during the year by month (e.g., March-September), about 30% – at the end of the year (e.g., October-December) based on the results of their work and achievement of the agricultural production plan, as well as on the performance of the company's financial and operational activities. The distribution of current bonuses for employees in the crop production sector should be made considering the seasonality of work during the sowing campaign, harvesting, etc.

Researchers N. Patyka & Y. Pasichnyk (2023) proved that economic factors, specifically the state of agricultural enterprises, significantly affect the incomes of rural residents, where the number of employed people is decreasing. Therefore, overcoming rural poverty should be based on the diversification of the rural economy. The authors of this study share the conclusions of researchers, with whom the proposed recommendations for remuneration in agricultural production do not coincide but complement them in terms of forming levers of influence on increasing labour productivity through remuneration at the micro level of the agricultural economy.

The developed proposals for non-monetary motivation using the tools of the general principles and approaches of the enterprise quality management system through a system of measures and influences determined by the purpose, psychological prerequisites, and gender and age structure can directly or indirectly affect the factors of staff growth and encouragement (Popyk, 2021). This is indirectly (tangentially, concomitantly, etc.) related to staff remuneration and is planned to be considered in the further research on the development of the labour motivation system in agricultural enterprises. In this perspective of non-monetary labour incentives, the formation of social capital is also important (Vyborna, 2021), under which the researcher considers relationships based on trust, mutual obligations, and stable social ties that contribute to the development and strengthening of competitive advantages and the generation of surplus income in enterprises. The presence of social capital ensures the growth of population welfare, development of communities, regions, industries, and the national economy. This was also noted by M. Hrytsaienko (2021), who substantiated the significance of social capital in enterprises to ensure the development of corporate social responsibility. The above findings do not contradict, but complement the arguments and importance of establishing the process of regulating social and labour relations in agricultural enterprises in the formal plane through the conclusion of collective agreements, the approval of regulations on remuneration, bonuses, etc., where a prominent place is given to the issues of labour organisation and determining the planned earnings in agricultural enterprises, which will ensure trust in the employer-employee relationship.

The issue of monetary and non-monetary labour motivation is often discussed by scientists at scientific conferences. For example, N.I. Tsehelnyk & L.H. Haidamachenko (2024), who addressed the consideration of international practices in the application of labour motivation methods and approaches: the creation of a respective HR department, its performance evaluation, development of corporate culture, provision of a social package, etc. O. Petrovska (2024) asserted the significance of ensuring fair remuneration, the use of rewards (bonuses) in personnel management and the strategic development of social and labour relations. O. Plesiuk & A. Slyzovska (2024) described the classification and size of bonuses, the procedure for their payment, while O. Riabchuk & A. Petukhova (2024) considered the areas of audit of calculations, which in the future will avoid violations of labour legislation and labour remuneration conditions at enterprises. In contrast to the findings of the analysed scientific conferences, the present study offered a set of proposals for the rational organisation of material incentives for productive labour of personnel in agricultural enterprises and concerned a separate technological process – grain harvesting. It was found and predicted that the mathematical

mechanism for calculating tariff rates and the corresponding formation of the tariff scale for remuneration of labour of other components of incentive wages, as described in the study, is planned for the period up to 2027.

To develop regulations and plan the labour remuneration fund, agricultural enterprises have a wide range of tools to provide financial incentives to staff. The key performance indicators for material incentives for agricultural workers during grain harvesting should include indicators of prompt and high-quality performance of labour processes, the level of yield achieved compared to the planned indicators, gross harvest, performance of seasonal tasks, labour standards, etc.

CONCLUSIONS

These areas of ensuring the incentive function of wages (increasing tariff rates of remuneration, establishing a choice of extra payments and allowances, paying bonuses, etc.) allow employees to be interested and motivated to work efficiently: to harvest grain crops in a short time with less biological losses and better grain quality. To this end, it is necessary, above all, to organise this agro-technological process by forming temporary primary labour teams with the corresponding equipment, to establish reasonable labour standards, to consider seasonal conditions and characteristics of the crops grown, and to plan suitable work and rest regimes for production personnel. The organisation of remuneration of production personnel should start with the regulation of the earnings structure in the agricultural sector of the economy, forecasting and substantiating the provision of a competitive level of salary for the productive work of personnel. The calculations made and the tariff scale with increased rates, as well as the examples of additional payments and allowances, were developed for use in Ukrainian enterprises for the relevant categories of employees. It is also necessary to include a certain part of the payroll fund for current bonuses at the end of the business year and considering certain seasonal work according to the skills and grade of employees.

As a conclusion, improving the material incentives for workers in the harvesting of grain crops in agricultural enterprises requires further research, which should include determining the structure of material incentives in the labour motivation system at certain stages of production. Establishing and analysing the degree of influence of other intangible motivational factors on labour productivity, as well as substantiating practical measures for the use of material incentives for personnel at certain technological processes. This technological technique is the last and decisive for summarising the results of the economic year for the grain sector of each enterprise as a strategic direction of agribusiness in Ukraine (grain wedge in the total crops of Ukrainian enterprises exceeds 50%), and therefore the development of scientific and methodological recommendations for remuneration of labour during grain harvesting will be useful for specialists of specialised agro-economic services of agricultural enterprises.

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CONFLICT OF INTEREST

None.

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Організація оплати праці на збиранні врожаю зернових культур у сільськогосподарських підприємствах

Анотація. Осучаснення наукових рекомендацій щодо оплати праці на збиранні врожаю зернових культур у підприємствах є актуальним, оскільки потенційно може сприяти вищій врожайності, більшим валовим зборам і трудовим доходам працівників, зменшенню втрат і підвищенню якості зерна, більш ефективному використанню технічних і людських ресурсів. Метою дослідження було обґрунтування наукових засад організації оплати праці на збиранні врожаю зернових культур у сільськогосподарських підприємствах із урахуванням змінних умов сьогодення. У ході дослідження використано такі методи: абстрактно-логічний, монографічний, статистико-економічний і системний підхід. Розкрито організаційні засади на збиранні врожаю зернових культур у підприємствах, які розпочинаються з формування трудових колективів і їх технічного забезпечення, режимів праці й відпочинку, ведення підсумованого обліку робочого часу залученого персоналу. Встановлено нормативні аспекти регулювання оплати праці й застосування тарифної сітки, доплат і надбавок, підвищення тарифних ставок оплати праці для визначених трьох категорій працівників підприємств на зборі врожаю зернових культур: механізаторів, водіїв і працівників у приймальних підрозділах. Доведено, що оплата праці для більшості найманих працівників у сільськогосподарських підприємствах сформована на основі тарифної системи оплати праці, яка цілком забезпечує диференціацію та обґрунтованість розмірів заробітної плати залежно від кількості й якості виконаної роботи. Запропоновано основні методичні підходи до організації праці та формування тарифної сітки й відповідних годинних тарифних ставок оплати праці на збиранні зернових культур, що варто включати як наповнення до колективних договорів, положень про оплату праці, положень про преміювання в

сільськогосподарських підприємствах. У сформованій тарифній сітці передбачається можливість підвищення міжрозрядних коефіцієнтів для посилення стимулюючої функції заробітної плати на зборі врожаю зернових культур. Розглянуті можливі доплати й надбавки, преміальні виплати, які рекомендовано застосовувати на вибір, щоб додатково стимулювати виробничий персонал підприємства до кращих кількісних і якісних показників їх праці. Практичне значення результатів дослідження полягало в можливості безпосереднього їх використання в сільськогосподарських підприємствах для забезпечення матеріального стимулювання виробничого персоналу до продуктивної праці на збиранні врожаю зернових культур, від якого значною мірою залежить економічний стан господарств

Ключові слова: заробітна плата; тарифна система; виробничий персонал; колективний договір; соціально-трудові відносини; агробізнес

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