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# METHODOLOGY OF FINANCIAL MANAGEMENT AND INNOVATIVE MARKETING OF TRADE ACTIVITIES OF AGRO-PROCESSING SMART ENTERPRISES

## ABSTRACT

The article examines the relationship between financial management and innovative marketing in the trading activities of agro-processing smart enterprises. The emphasis is on the fact that the combination of modern financial management tools with innovative marketing strategies is a key factor in ensuring the competitiveness and sustainability of companies in a changing global environment. The article analyzes the financial and economic indicators of leading enterprises in the industry, traces the dynamics of their investment activity, export orientation, and the features of the use of marketing tools to strengthen market positions. The use of statistical methods and economic and mathematical modeling made it possible to quantitatively assess the impact of net income from product sales and marketing expenses on the level of financial autonomy of enterprises.

The results of the study show that enterprises that actively implement innovative marketing tools and combine them with effective financial management demonstrate a higher level of financial stability, the ability to adapt to market fluctuations, and create the prerequisites for long-term growth. Considerable attention is paid to export activity as a factor of integration into international markets and increasing the financial autonomy of companies. It is shown that large enterprises of the industry are prone to an active investment policy, which in the short term can create a negative cash flow, but in the long term provides modernization and strengthening of competitive advantages.

Thus, the systematic combination of financial management and innovative marketing in agro-processing smart enterprises is not just a condition for increasing the efficiency of their activities, but also a strategic direction of development, which determines their stability, investment attractiveness, and ability to ensure the economic security of the state in conditions of global economic turbulence.

**Keywords:** financial management, methodology, innovative marketing, agro-processing smart enterprises, export activities, financial autonomy

**JEL Classification:** M31, M41, O13, Q13

## INTRODUCTION

The modern agro-processing industry of Ukraine operates in conditions of increased competition and instability of external markets, which necessitates the implementation of effective financial and marketing strategies. For smart enterprises focused on innovation, the combination of financial management with innovative marketing becomes a decisive factor in growth and stability. It is important not only to manage resources and capital, but also to form a product promotion system that takes into account digitalization, the dynamics of consumer preferences, and integration into international markets. It is in this area that the task arises to investigate how innovative approaches to marketing affect the financial stability of agro-processing companies and how the interaction between them determines the prospects of the industry.

## LITERATURE REVIEW

Analysis of scientific sources shows that the combination of financial management and marketing practices is the key to the formation of competitive advantages in the processing industry. Researchers emphasize that the development of enterprises largely depends on the effectiveness of financial flow management, the introduction of digital technologies, and export orientation. At the same time, it is noted that marketing innovations, in particular the use of direct and digital marketing tools, determine the positions of enterprises in international markets. The works emphasize that financial autonomy and investment activity are indicators of the ability of companies to ensure long-term growth. Thus, the literature analysis confirms the relevance of studying an integrated model that takes into account both financial and marketing factors of development.

The study of the institutional framework for the management of agro-industrial parks, the role of information parameters, and social intelligence (Boru et al., 2025; Raskin et al., 2023; Palašćáková et al., 2023) allows us to understand how organizational mechanisms and social factors affect the effectiveness of financial and marketing strategies. These works emphasize the need for high-quality management of information flows and the involvement of human potential, which is directly related to the development of smart enterprises. At the same time, a significant number of studies focus on ensuring competitiveness and resource conservation. The analysis of strategic management of competitive advantages, resource-saving technologies, and renewable energy (Voronina et al., 2022; Markina et al., 2022) shows that the financial sustainability of agro-processing companies largely depends on the efficient use of resources and the introduction of innovations into production processes. This creates the basis for increasing profitability and reducing dependence on external market fluctuations.

An important direction is the methodological support of enterprise management through digital technologies and financial instruments. Studies on IT project management, quality control systems, and creditworthiness of companies (Kopishynska et al., 2021; Dankevych et al., 2023; Dmytryshyn & Blahun, 2014) confirm that it is systemic approaches to financial control and digitalization that ensure long-term business efficiency. This is important for agro-processing companies that need stability in the context of integration into international markets.

No less significant are works that explore bioenergy models, educational innovation clusters, and information security systems (Mirzoieva et al., 2022; Holinko et al., 2023). Their results demonstrate that the development of agricultural and processing enterprises is impossible without the introduction of new technological solutions and an educational environment that forms innovative human resources potential. Similar approaches complement the research on management in education (Kubitskyi et al., 2023), which notes the role of innovative approaches in training specialists for high-tech industries.

A significant contribution is made by works focusing on issues of global sustainability of food systems and improving financial control (Mamonova et al., 2023; Mazur et al., 2021). They show that modern challenges caused by war and crisis phenomena require flexible and effective financial instruments to support agro-processing enterprises. Issues of logistical support, employment regulation, and development of the national innovation system (Vashchenko et al., 2022; Pavlov et al., 2022) also become relevant for analysis, since they determine the level of adaptability of companies to new conditions. The work of Vasylychak et al. is indicative. (2022), which substantiates the mechanisms of state regulation of employment in the labor market of territorial communities in connection with the innovative development of entrepreneurship. This directly strengthens the argument of the article, since human resource capacity and local employment policy determine the effectiveness of financial and marketing strategies of agro-processing smart enterprises and their readiness for export-oriented growth.

Also relevant are studies that highlight the spatial organization of eco-clusters and modeling of development strategies based on sustainability (Dankevych et al., 2020; Voznyuk et al., 2022). They emphasize that the integration of environmental and financial approaches is crucial for the formation of competitive advantages of agricultural companies. In parallel, Mirzoieva et al. (2024) and Blagun (2013) demonstrate that cognitive models of financial systems and niche agricultural production have a significant impact on food security and the development of market mechanisms.

Of particular note are works devoted to the impact of digitalization and artificial intelligence on competitiveness (Bieliálov et al., 2024; Kubitskyi et al., 2024). They emphasize that modern business cannot develop without innovative technologies that transform both financial processes and marketing strategies. This confirms the relevance of the article to a wide range of interdisciplinary research that combines financial, marketing, social, and technological dimensions.

Dankevych et al. (2022), Dibrova et al. (2024), and Prokopenko et al. (2024) highlight the issues of digital security in finance, European standards of local development, modeling of the niche grain market, and digital learning in entrepreneurship, which comprehensively support the idea of the article about combining innovative marketing and financial management in agro-processing smart enterprises.

Ruin et al. (2020), Bezverkhyi et al. (2019), Dankevych et al. (2021), and Nkosi et al. (2024) analyze cybersecurity as a component of financial security, integrated reporting assessment models, ecological and economic management of innovations, and features of agricultural investments, which indicates the universality of the issues and the need for the transfer of international experience for the development of Ukrainian enterprises. Ali (2025) and Raskin et al. (2021) consider the optimization of management decisions under uncertainty, which is directly related to the study of the integration of financial and marketing strategies in agro-processing.

Thus, the literature review shows that scientific works cover a wide range of aspects - from financial security, creditworthiness, and controlling to clustering, digitalization, and energy sustainability. This confirms the complexity of the issues of financial management and innovative marketing of agro-processing smart enterprises and emphasizes the need for integrated approaches in the study of their effectiveness.

## AIMS AND OBJECTIVES

The aim of the article is to provide a theoretical and methodological justification and empirical study of the impact of financial management and innovative marketing on the results of trading activities of agro-processing smart enterprises. The objectives of the study are to identify the features of the functioning of key enterprises in the industry, analyze the dynamics of their financial and economic indicators, assess investment activity and the effectiveness of marketing costs, and build regression models that demonstrate the relationships between financial results and innovative approaches to marketing.

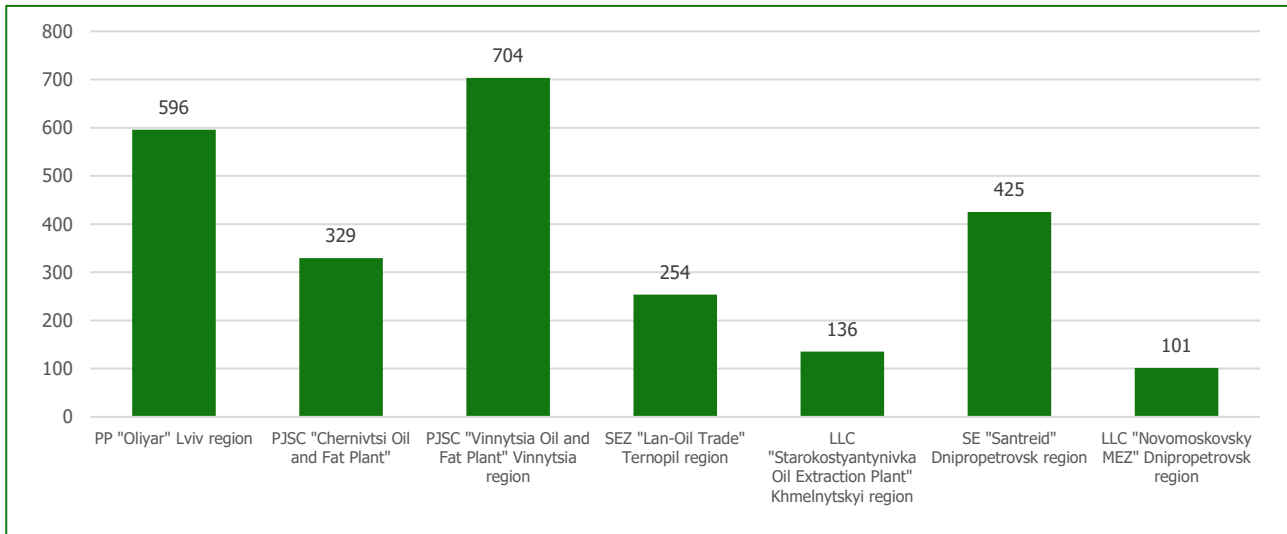
## METHODS

The study used a systematic and comprehensive approach that combines quantitative and qualitative analysis. The basis for the empirical study was the financial and economic reports of a number of leading agro-processing enterprises of Ukraine for the last five years. Methods of financial analysis, comparative statistics, and graphic visualization of the dynamics of indicators were applied. For an in-depth assessment of the efficiency of the functioning of enterprises, correlation-regression modeling was conducted, which allowed to identify the relationship between revenue volumes, marketing expenses, and the autonomy coefficient. The use of economic and mathematical forecasting tools made it possible to determine possible scenarios for the development of enterprises and the prospects for their financial stability.

## RESULTS

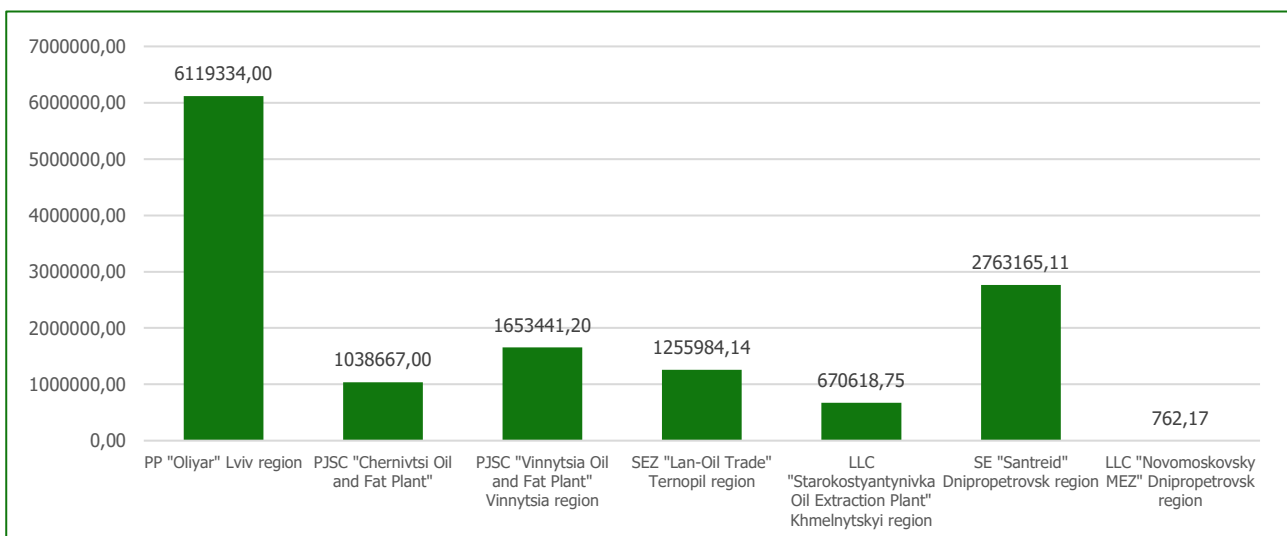
The study of the methodology of financial management and innovative marketing in the trading activities of agro-processing smart enterprises requires reference to the practice of key business entities in the processing industry. An important example is the industrial group "ViOil", which includes a number of business entities. In particular, PJSC "Chernivtsi Oil and Fat Plant" which operates in the Chernivtsi region and specializes in the production and processing of oilseeds. Among them, a special place is occupied by PE "Oliyar", which operates in the Lviv region and demonstrates modern approaches to the organization of production and sales processes. Similarly, a significant role in the formation of innovative business models is played by PJSC "Vinnytsia Oil and Fat Plant", located in the Vinnytsia region and known for its stable financial results. In the Ternopil region, there is an oil extraction plant "Lan-Oil Trade", which combines modern marketing practices with a high level of production capacity. Significant experience in processing activities is demonstrated by LLC "Starokostyantynivskyi Oil Extraction Plant", located in the Khmelnytskyi region, which is distinguished by its ability to adapt to changing market conditions. At the same time, an example of effective international cooperation is the subsidiary with foreign investment "Santrade", which operates in the Dnipropetrovsk region and implements the latest financial management tools. This group of enterprises is complemented by LLC "Novomoskovskiy MEZ", also located in the Dnipropetrovsk region, which focuses on the application of innovations in production processes and expanding export potential. The selected agro-processing companies occupy leading positions among innovation-oriented business entities in their regions. Their activities are characterized by the active use of digital information technologies, the implementation of foreign economic projects, the implementation of integrated marketing strategies, and an orientation towards investment development.

Using public statistical, accounting, and financial information, we will analyze the performance indicators and financial analytics of selected agro-processing enterprises over the last five years. A graphical comparison of the performance indicators of selected agro-processing smart enterprises over the last five years is presented in Figures 1-5.



**Figure 1. Dynamics of the number of employees of agro-processing smart enterprises, 2020-2024.** (Source: summarized by the authors using financial and economic reporting of enterprises)

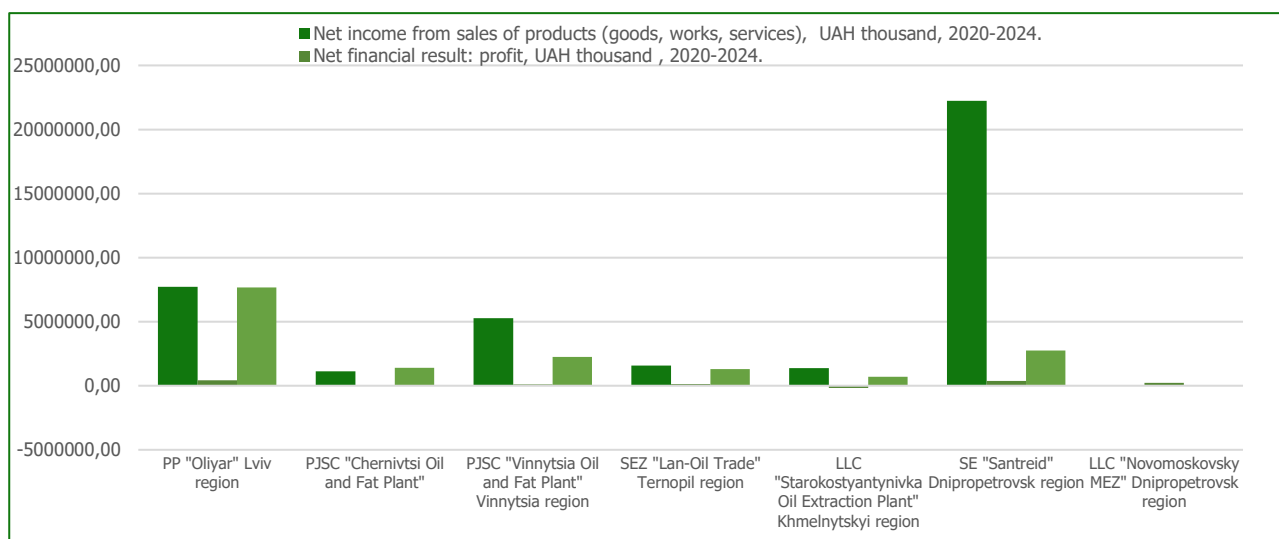
The largest number of employees is at PJSC "Vinnytsia Oil and Fat Plant", where 704 people work. The second largest is PE "Oliyar" (Lviv region) with 596 employees, which indicates high production capacity and a significant impact on the regional economy. A fairly large employer is also SE "Santreid" (Dnipropetrovsk region) with a staff of 425 people. Among medium-sized enterprises in terms of the number of employees, PJSC "Chernivtsi Oil and Fat Plant" (329 people) and SEZ "Lan-Oil Trade" (Ternopil region) (254 people) stand out. Such companies demonstrate stability, but are inferior to the leaders in terms of scale. The smallest number of personnel is in LLC "Starokostyantynivskiy Oleinoekstraktsiyny Zavod" (136 people) and LLC "Novomoskovskii MEZ" (101 people), which indicates their smaller production capacities and possible specialization in narrow market segments. The general trend shows that the number of personnel directly correlates with the size of enterprises and the scale of their activities in the domestic and foreign markets. The leaders of the industry are concentrated in Vinnytsia, Lviv, and Dnipropetrovsk regions, which form regional centers for the development of the processing industry.



**Figure 2. Dynamics of the cost of products sold (goods, works, services) of agro-processing smart enterprises, 2020-2024.** (Source: summarized by the authors, taking into account the financial and economic reporting of enterprises)

In Diagram 2, there is a significant difference in the costs of enterprises. The absolute leader in terms of the cost of products sold is PE "Oliyar" (Lviv region) with an indicator of over UAH 61 million, which is almost 2.2 times higher than

the value of the closest competitor. This indicates the scale of production and the high share of this enterprise in the market. The second place in terms of costs is taken by SE "Santrade" (Dnipropetrovsk region) with a level of over UAH 27.6 million, which indicates a significant intensity of production and sales processes and active participation in foreign economic activity. The average level of costs is demonstrated by PrJSC "Vinnytsia Oil and Fat Plant" (UAH 16.5 million) and SEZ "Lan-Oil Trade" (UAH 12.6 million), which occupy stable positions in the regional context and ensure the optimal ratio between costs and production volumes. Lower indicators are observed in PrJSC "Chernivtsi Oil and Fat Plant" (UAH 10.4 million) and LLC "Starokostyantynivsky Oil Extraction Plant" (UAH 0.67 million). This may indicate relatively limited production capacity or narrow specialization of these enterprises. The lowest cost level is observed in LLC "Novomoskovsky MEZ" (UAH 762 thousand), which is significantly inferior to the rest of the companies and may be a consequence of both a decrease in production volumes and a transformation of the business model towards more niche products. In general, the analysis indicates a high concentration of the market in the hands of several large players, "Oliyar" and "Santrade", which determine the dynamics of cost in the industry. The remaining enterprises operate in the medium and small segment, which creates conditions for regional specialization and maintaining diversification of the agro-processing sector.



**Figure 3. Dynamics of production and financial activity indicators of agro-processing smart enterprises, 2020-2024.** (Source: summarized by the authors, taking into account the financial and economic reporting of enterprises)

The graph shows three key indicators: net income from sales of products, net financial result (profit), and sales revenue.

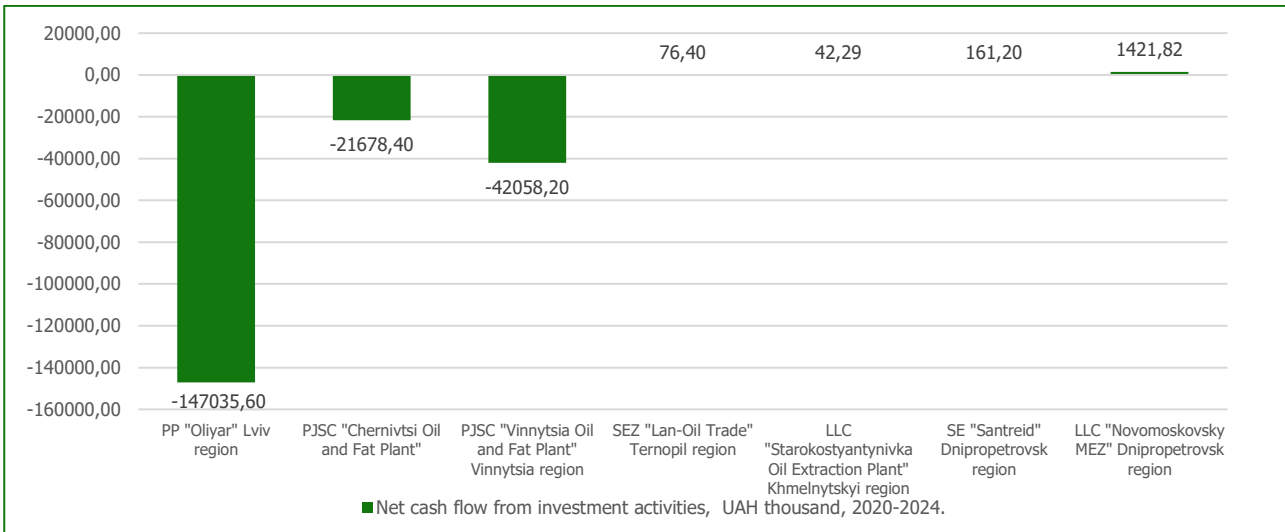
The highest results are demonstrated by SE "Santrade" (Dnipropetrovsk region), which is significantly ahead of other enterprises in terms of net income and revenue. This indicates the significant integration of the company into foreign economic markets and the scale of its activities.

High indicators are also shown by PE "Oliyar" (Lviv region) and PrJSC "Vinnytsia Oil and Fat Plant", which maintain stable positions among the industry leaders. They are characterized by a balance between income, profit, and expenses, which confirms their financial stability.

PrJSC "Chernivtsi Oil and Fat Combine", OEZ "Lan-Oil Trade" (Ternopil region), and LLC "Starokostyantynivskyi Oil Extraction Plant" (Khmelnytskyi region) demonstrate average results: their income and revenues are significantly lower, but they remain in the positive zone in terms of profitability, which indicates the ability to maintain market positions.

LLC "Novomoskovsky MEZ" (Dnipropetrovsk region) attracts particular attention, which has minimal indicators and practically no net profit. This indicates a weak market position and possible problems with the development strategy or resource base.

Overall, the analysis confirms that the market for agro-processing enterprises is highly concentrated: the lion's share of income and profits is formed by a few large companies, while others operate within the framework of regional specialization. This creates a situation where innovative management models and strategic financing become critical for increasing the efficiency of medium and small enterprises.



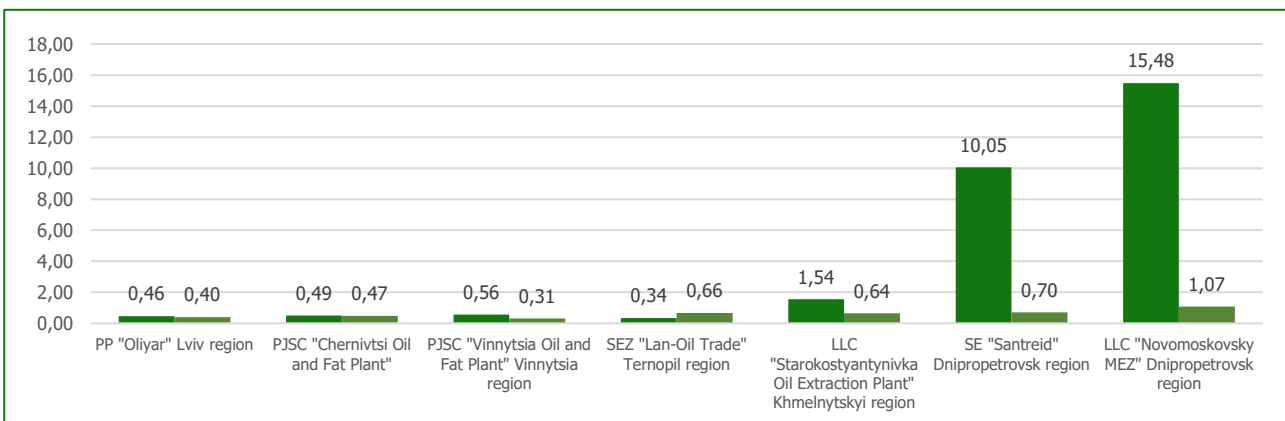
**Figure 4. Dynamics of net cash flow from investment activities of agro-processing smart enterprises, 2020-2024.** (Source: summarized by the authors, taking into account the financial and economic reporting of enterprises)

Figure 4 shows a significant difference in the indicators of enterprises. The largest negative values are for PrJSC "Vinnytsia Oil and Fat Plant" (UAH -42,058.2 thousand) and PE "Oliyar" Lviv region (UAH -147,035.6 thousand), which indicates significant investment costs aimed at modernization and development of production. Similarly, PrJSC "Chernivtsi Oil and Fat Plant" also demonstrates a negative cash flow (UAH -21,678.4 thousand), which indicates an active investment policy.

On the other hand, SEZ "Lan-Oil Trade" (UAH 76.4 thousand), LLC "Starokostyantynivskiy Oil Extraction Plant" (UAH 42.29 thousand), SE "Santreid" (UAH 161.2 thousand), and especially LLC "Novomoskovskii MEZ" (UAH 1421.82 thousand) show positive values. This means that their investment costs were less than the compensation or income, which may indicate a cautious policy or the completion of active investment cycles.

In general, negative indicators of leading enterprises in the industry are interpreted as a sign of active renewal of production capacities and development of innovative activities. At the same time, positive values in smaller companies may indicate both effective management of investment flows and limitations in the implementation of large-scale modernization projects.

Thus, the agro-processing market demonstrates multi-directional strategies: large players actively invest in the future, forming the basis for long-term growth, while small and medium-sized enterprises strive for stabilization and preservation of liquidity.



**Figure 5. Dynamics of financial indicators of agro-processing smart enterprises, 2020-2024.** (Source: summarized by the authors, taking into account the financial and economic reporting of enterprises)

Figure 5 presents two key indicators - the autonomy coefficient and the debt ratio, which allow assessing the financial stability of enterprises.

In most companies, the autonomy coefficient ranges from 0.3 to 0.6, which indicates a relatively balanced ratio between own and borrowed resources. Thus, in PrJSC "Vinnytsia Oil and Fat Plant" (0.56), PrJSC "Chernivets Oil and Fat Plant" (0.49), and PE "Oliyar" (0.46), there is an optimal value, which indicates the ability of enterprises to finance a significant part of their activities from their own capital.

At the same time, the enterprises LLC "Starokostyantynivskiy Oleinoekstraktsiynny Zavod" (1.54), DP "Santreid" (10.05), and especially LLC "Novomoskovskii MEZ" (15.48) demonstrate critically high debt ratios. This means that their activities are largely dependent on borrowed funds, which reduces financial stability and increases the risk of insolvency in the event of market fluctuations.

On the other hand, the autonomy ratios of most medium-sized companies (0.31–0.66) indicate relative stability, as they provide a certain independence from creditors. This is especially true for the agro-processing industry, where the need for long-term investments is significant.

In general, the analysis shows the presence of two opposing groups of enterprises: the first is financially stable companies that rely mainly on their own resources, the second is enterprises with a high dependence on borrowed capital, which, on the one hand, ensures rapid growth, but on the other hand, creates serious risks in the field of financial security. At the next stage, using the financial statements of selected agro-processing enterprises, we will verify the compliance of their production and financial results with the requirements of the "golden rule of enterprise economics". In the process of studying the dynamics of absolute indicators, it is important to analyze how their changes are consistent with the optimal proportions of development. For this purpose, Table 1 will systematize the key indicators of production and financial activity of enterprises over the past five years.

**Table 1. Dynamics of indicators of production and financial activity of agro-processing smart enterprises, 2020–2024.** (Source: summarized by the authors using financial and economic reporting of enterprises)

Indicator	Growth rate 2021/2020, %	Growth rate 2022/2021, %	Growth rate 2023/2022, %	Growth rate 2024/2023, %
PP "Oliyar" Lviv region				
Net financial result: profit	61.97%	307.63%	113.83%	110.01%
Net income from sales of products (goods, works, services)	137.79%	146.69%	83.81%	115.07%
Average value of assets	106.85%	105.35%	101.88%	101.83%
PrJSC "Chernivtsi Oil and Fat Plant"				
Net financial result: profit	151.48%	97.16%	21.42%	36.43%
Net income from sales of products (goods, works, services)	60.04%	794.76%	383.06%	51.79%
Average value of assets	107.82%	106.29%	102.79%	102.74%
PJSC "Vinnytsia Oil and Fat Plant", Vinnytsia region				
Net financial result: profit	159,88%	64,27%	98,40%	96,52%
Net income from sales of products (goods, works, services)	963,51%	18,45%	52,88%	42,17%
Average value of assets	105,53%	104,06%	100,65%	100,62%
SEZ "Lan-Oil Trade" Ternopil region				
Net financial result: profit	134,68%	1426,37%	81,01%	83,05%
Net income from sales of products (goods, works, services)	113,58%	614,32%	207,67%	115,60%
Average value of assets	109,36%	107,79%	104,22%	104,14%
LLC "Starokostyantynivka Oil Extraction Plant" Khmelnytskyi region				
Net financial result: profit	-6,53%	-4087,72%	0,62%	3356,52%
Net income from sales of products (goods, works, services)	177,02%	198,08%	276880,48%	15,27%
Average value of assets	109,36%	107,79%	104,22%	104,14%
SE "Santrade" Dnipropetrovsk region				
Net financial result: profit	120,06%	-186,36%	-42,54%	149,48%
Net income from sales of products (goods, works, services)	141,88%	39,49%	112,10%	151,97%
Average value of assets	109,36%	107,79%	104,22%	104,14%
LLC "Novomoskovskiy MEZ" Dnipropetrovsk region				
Net financial result: profit	752.74%	20.80%	371.30%	172.08%
Net income from sales of products (goods, works, services)	108.20%	76.92%	29.93%	66.67%
Average value of assets	109.36%	107.79%	104.22%	104.14%

To determine the extent to which the indicators of production and financial activity of the selected agro-processing smart enterprises correspond to the "golden rule of enterprise economics", we adapt the balanced growth formula. Thus, as a result of calculating the compliance of the studied agro-processing enterprises with the "golden rule of enterprise economics" over the past five years, the characteristics of their activities were obtained, which are grouped in Table 2.

**Table 2. Calculation of compliance of agro-processing smart enterprises with the "golden rule of enterprise economics", 2020-2024.**  
 (Source: calculated by the authors using financial and credit reporting of enterprises)

Agro-processing enterprises	2021/2020	2022/2021	2023/2022	2024/2023
PP "Oliyar" Lviv region	Incomplete compliance with the "golden rule of enterprise economics"	Full compliance with the "golden rule of enterprise economics"	Incomplete compliance with the "golden rule of enterprise economics"	Full compliance with the "golden rule of enterprise economics"
PJSC "Chernivtsi Oil and Fat Plant"		Incomplete compliance with the "golden rule of enterprise economics"		Incomplete compliance with the "golden rule of enterprise economics"
PJSC "Vinnytsia Oil and Fat Plant", Vinnytsia region	Full compliance with the "golden rule of enterprise economics"			
SEZ "Lan-Oil Trade" Ternopil region				
LLC "Starokostyantynivka Oil Extraction Plant" Khmelnytskyi region	Incomplete compliance with the "golden rule of enterprise economics"			
SE "Santrade" Dnipropetrovsk region	Full compliance with the "golden rule of enterprise economics"	Incomplete compliance with the "golden rule of enterprise economics"		Full compliance with the "golden rule of enterprise economics"
LLC "Novomoskovsky MEZ" Dnipropetrovsk region				

Table 2 demonstrates the assessment of the compliance of the dynamics of production and financial indicators of agro-processing smart enterprises with the "golden rule of enterprise economics" for the period 2020–2024. The analysis shows that none of the enterprises was able to maintain stable full compliance throughout the entire period under study. Only individual companies in certain years achieved optimal proportions of profit, income, and asset growth, which indicates the presence of positive trends, but at the same time, the lack of consistency in compliance with this rule.

PE "Oliyar" and SE "Santrade" periodically demonstrated compliance with the "golden rule", but also had years with a decrease in dynamics, which indicates fluctuations in the ratio of financial results. PrJSC "Vinnytsia Oil and Fat Combine" and SEZ "Lan-Oil Trade" only once confirmed compliance with optimal proportions, after which the indicators deviated from the requirements. PJSC "Chernivtsi Oil and Fat Plant" throughout the entire period did not achieve full compliance, which characterizes its development as unstable in terms of financial balance.

Among the positive exceptions, LLC "Novomoskovsky MEZ" stands out, which in most years demonstrated compliance with the "golden rule", which reflects a certain level of financial stability and competent resource management even in the conditions of regional specificity and smaller scale of activity.

In general, the results of the table confirm that compliance with the "golden rule" remains more of a situational achievement than a stable trend. This indicates the need to strengthen financial management, strategic planning, and an innovative approach to resource management in order to ensure harmonious and balanced development of enterprises in the long term.

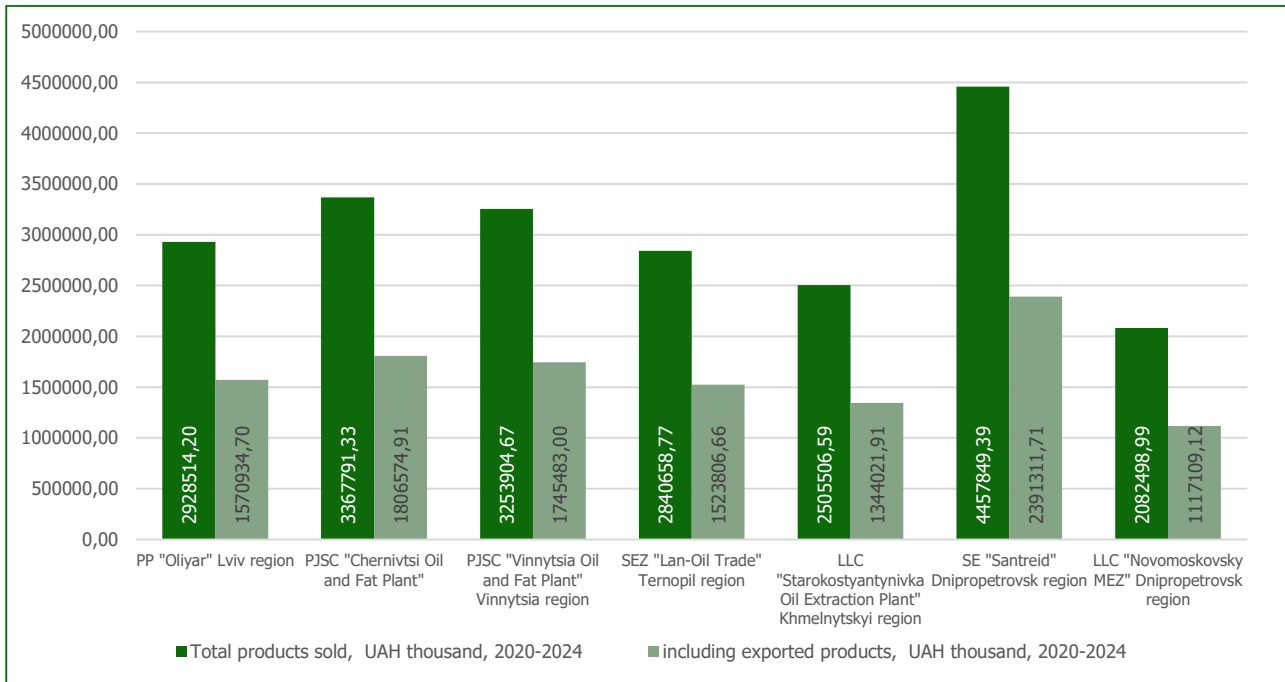
The next stage of research on the selected topic is the participation of the specified agro-processing smart enterprises in trading activities and the expansion of the innovative marketing system.

The dynamics of the indicators of trade activity of agro-processing smart enterprises over the last five years are presented in Table 3.

**Table 3. Dynamics of the indicators of trade activity of agro-processing smart enterprises, 2020-2024.** (Source: summarized by the authors using financial and credit reporting of enterprises)

Indicators	2020	2021	2022	2023	2024	On average, 2020-2024	Deviation 2024 from 2020, + -
<b>PP "Oliyar" Lviv region</b>							
Export of products, tons	1732.68	674.19	10769.22	11628.57	13446.84	7650.30	11714.16
Total products sold, UAH thousand	1588432.50	3130199.10	3249423.90	3327009.90	3347505.60	2928514.20	1759073.10
including exported products, UAH thousand	1110812.40	1651087.80	1680129.00	1689993.00	1722651.30	1570934.70	611838.90
Share of exports in the total volume of products sold, %	62.94	47.47	46.53	45.72	46.31	49.80	-16.62
Average selling price of exported products, UAH/t	3495.60	5142.60	8785.80	9298.20	10143.30	7373.10	6647.70
<b>PJSC "Chernivtsi Oil and Fat Plant"</b>							
Export of products, tons	1992.58	775.32	12384.60	13372.86	15463.87	8797.84	13471.28
Total products sold, UAH thousand	1826697.38	3599728.97	3736837.49	3826061.39	3849631.44	3367791.33	2022934.07
including exported products, UAH thousand	1277434.26	1898750.97	1932148.35	1943491.95	1981049.00	1806574.91	703614.74
Share of exports in the total volume of products sold, %	72.38	54.59	53.52	52.57	53.26	57.26	-19.12
Average selling price of exported products, UAH/t	4019.94	5913.99	10103.67	10692.93	11664.80	8479.06	7644.85
<b>PJSC "Vinnytsia Oil and Fat Plant", Vinnytsia region</b>							
Export of products, tons	1925.20	749.10	11965.80	12920.63	14940.93	8500.33	13015.73
Total products sold, UAH thousand	1764925.00	3477999.00	3610471.00	3696677.67	3719450.67	3253904.67	1954525.67
including exported products, UAH thousand	1234236.00	1834542.00	1866810.00	1877770.00	1914057.00	1745483.00	679821.00
Share of exports in the total volume of products sold, %	69.93	52.75	51.71	50.80	51.46	55.33	-18.47
Average selling price of exported products, UAH/t	3884.00	5714.00	9762.00	10331.33	11270.33	8192.33	7386.33
<b>SEZ "Lan-Oil Trade" Ternopil region</b>							
Export of products, tons	1680.70	653.96	10446.14	11279.71	13043.43	7420.79	11362.74
Total products sold, UAH thousand	1540779.53	3036293.13	3151941.18	3227199.60	3247080.43	2840658.77	1706300.91
including exported products, UAH thousand	1077488.03	1601555.17	1629275.13	1639293.21	1670971.76	1523806.66	593483.73
Share of exports in the total volume of products sold, %	61.05	46.05	45.14	44.35	44.93	48.30	-16.12
Average selling price of exported products, UAH/t	3390.73	4988.32	8522.23	9019.25	9839.00	7151.91	6448.27
<b>LLC "Starokostyantynivka Oil Extraction Plant" Khmelnytskyi region</b>							
Export of products, tons	1482.40	576.81	9213.67	9948.89	11504.52	6545.26	10022.11
Total products sold, UAH thousand	1358992.25	2678059.23	2780062.67	2846441.80	2863977.01	2505506.59	1504984.76
including exported products, UAH thousand	950361.72	1412597.34	1437443.70	1445882.90	1473823.89	1344021.91	523462.17
Share of exports in the total volume of products sold, %	53.85	40.62	39.81	39.11	39.62	42.60	-14.22
Average selling price of exported products, UAH/t	2990.68	4399.78	7516.74	7955.13	8678.16	6308.10	5687.48
<b>SE "Santreid" Dnipropetrovsk region</b>							
Export of products, tons	2637.52	1026.27	16393.15	17701.27	20469.08	11645.46	17831.55
Total products sold, UAH thousand	2417947.25	4764858.63	4946345.27	5064448.40	5095647.41	4457849.39	2677700.16
including exported products, UAH thousand	1690903.32	2513322.54	2557529.70	2572544.90	2622258.09	2391311.71	931354.77
Share of exports in the total volume of products sold, %	95.81	72.26	70.84	69.59	70.50	75.80	-25.30
Average selling price of exported products, UAH/t	5321.08	7828.18	13373.94	14153.93	15440.36	11223.50	10119.28
<b>LLC "Novomoskovsky MEZ" Dnipropetrovsk region</b>							
Export of products, tons	1232.13	479.42	7658.11	8269.21	9562.20	5440.21	8330.07
Total products sold, UAH thousand	1129552.00	2225919.36	2310701.44	2365873.71	2380448.43	2082498.99	1250896.43
including exported products, UAH thousand	789911.04	1174106.88	1194758.40	1201772.80	1224996.48	1117109.12	435085.44
Share of exports in the total volume of products sold, %	44.76	33.76	33.09	32.51	32.93	35.41	-11.82
Average selling price of exported products, UAH/t	2485.76	3656.96	6247.68	6612.05	7213.01	5243.09	4727.25

Let's track and analyze the sales of products in monetary terms and the cost of sales of agro-processing smart enterprises over the past five years. The dynamics of sales of products in monetary terms and the cost of sales of agro-processing smart enterprises over the past five years are graphically presented in Figure 6.



**Figure 6. Dynamics of sales in monetary terms and the cost of sales of agro-processing smart enterprises, 2020-2024.** (Source: summarized by the authors using financial and credit reporting of enterprises)

The diagram shows the total sales volumes and the share of exported goods. The highest results were achieved by the State Enterprise "Santrade" (Dnipropetrovsk region), where the total cost of sales exceeded UAH 6.8 million thousand, of which more than UAH 2.39 million thousand is for export. This indicates its key role in foreign economic operations and confirms its strong integration into international markets.

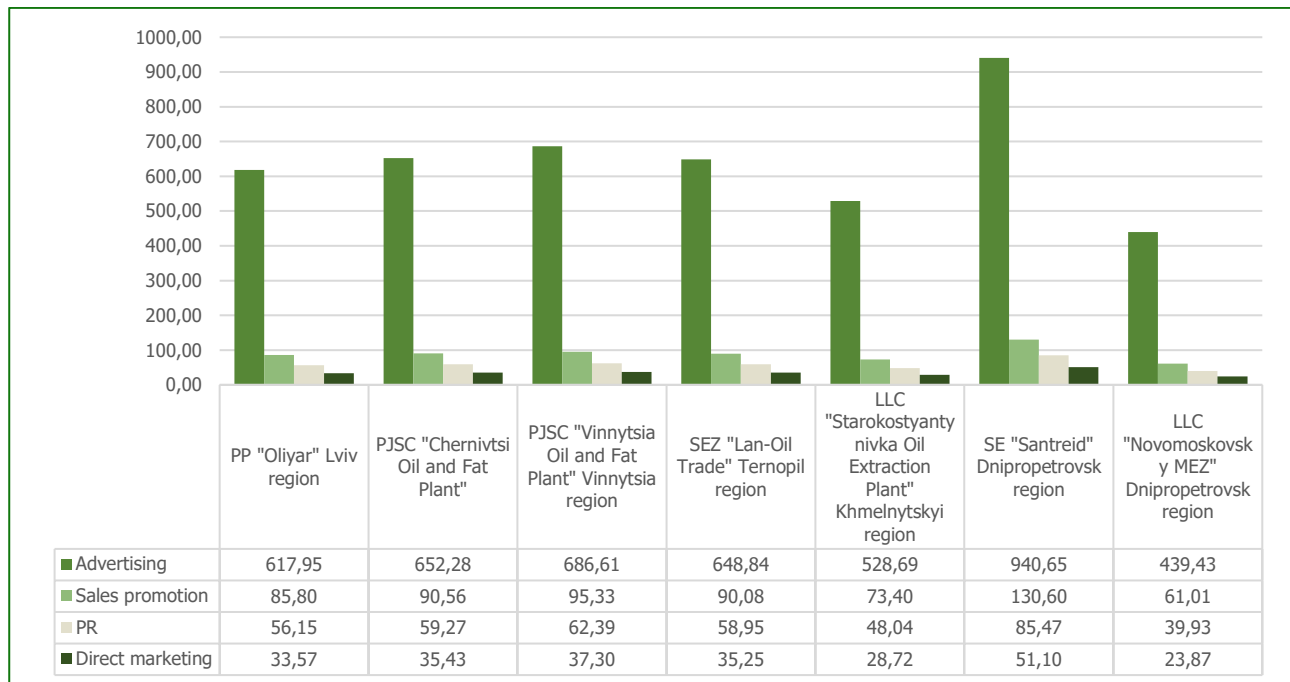
Stable high indicators are also observed in PrJSC "Chernivtsi Oil and Fat Plant" and PrJSC "Vinnytsia Oil and Fat Plant", the sales volumes of which are over UAH 3.3 million thousand, and the export component exceeds UAH 1.7–1.8 million thousand. This indicates well-established external logistics and the competitiveness of their products in international markets.

PP "Oliyar" (Lviv region) sold products at the level of UAH 2.9 million thousand, of which UAH 1.57 million thousand went to export. This indicates a significant dependence on international trade, since the share of exported products is significant relative to the total volume. The average level of sales was shown by OEZ "Lan-Oil Trade" (Ternopil region) with a volume of over UAH 2.8 million thousand and LLC "Starokostyantynivskiy Oil Extraction Plant" (Khmelnytskyi region) with UAH 2.5 million thousand. In both cases, the share of exports exceeds UAH 1.3–1.5 million thousand, which confirms their active participation in foreign markets, although the scale is inferior to the leaders.

The lowest indicators were recorded at LLC "Novomoskovskiy MEZ", which sold products at the level of UAH 2.08 million thousand, while exports amounted to only UAH 1.11 million. This may indicate both limited production capacities and narrow specialization of products that are less in demand in world markets.

In general, the analysis shows a clear pattern: industry leaders combine significant production volumes with a significant share of exports, which indicates their orientation to international markets and competitive positions in the global space. Smaller enterprises, although they have stable sales volumes, remain more vulnerable to fluctuations in the foreign economic environment.

The dynamics of innovative marketing costs of selected agro-processing smart enterprises over the past five years are graphically presented in Figure 7.



**Figure 7. Dynamics of innovative marketing costs of agro-processing smart enterprises, 2020-2024.** (Source: calculated by the authors, taking into account the financial and economic reporting of enterprises)

As we can see, the share of innovative marketing costs of the studied agro-processing smart enterprises is occupied by advertising tools on average 73.16%, sales promotion 10.18% and the least by direct marketing tools on average 3.93%.

The final stage of the study of financial management and innovative marketing in the trading activities of agro-processing smart enterprises was the conduct of a regression analysis with elements of modeling and forecasting of key parameters of the efficiency of their functioning. To build economic and mathematical dependencies, a linear production function, the Statistica 12 tool, and its statistical capabilities were used. This made it possible to investigate how net income from sales of products, in combination with marketing costs, affects the autonomy coefficient, which is an indicator of the financial stability and independence of the enterprise. As a result of processing the primary data of the selected agro-processing companies, correlation-regression models were built that reflected the quantitative measurement of the indicated relationships. The obtained parameters of the regression equations are summarized and presented in Table 4, which serves as the basis for further analytical conclusions and the formation of forecast scenarios for the development of enterprises (Table 4).

**Table 4. Coefficients of regression models of agro-processing smart enterprises, 2020-2024.**

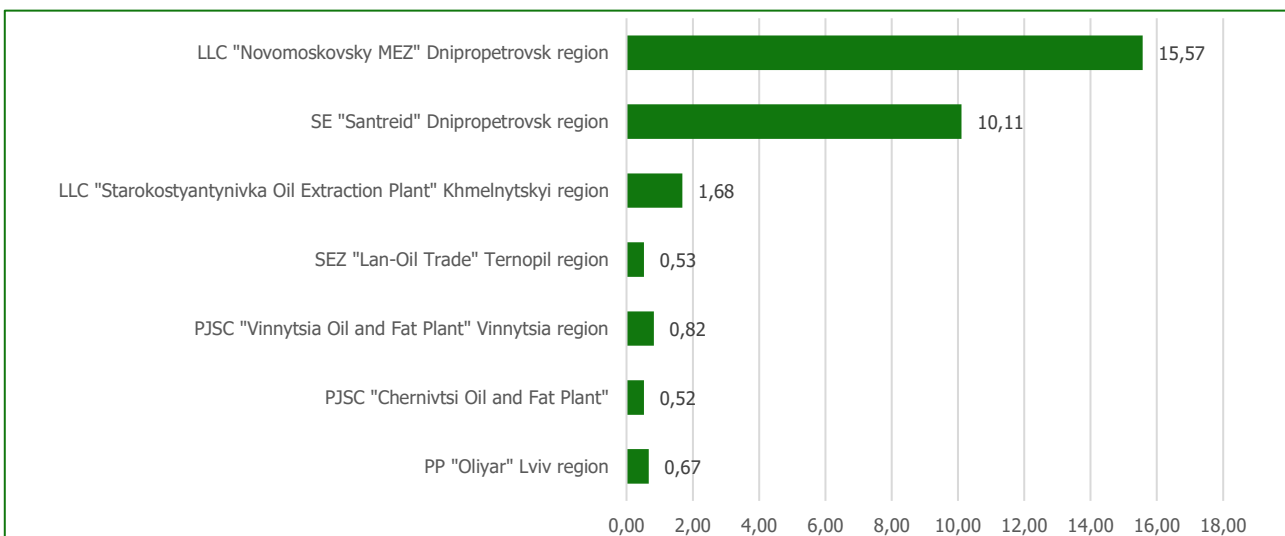
Equation coefficients	a <sub>2</sub>	a <sub>1</sub>	a <sub>0</sub>
PP "Oliyar" Lviv region	0,0028	-0,00000007	-1,24
PJSC "Chernivtsi Oil and Fat Plant"	-0,0028	0,000000025	2,81
PJSC "Vinnytsia Oil and Fat Plant", Vinnytsia region	-0,00017	-0,000000012	0,77
SEZ "Lan-Oil Trade" Ternopil region	0,00010	0,000000037	0,20
LLC "Starokostyantynivka Oil Extraction Plant" Khmelnytskyi region	0,00069	-0,000000001	1,07
SE "Santreid" Dnipropetrovsk region	-0,00049	-0,000000006	10,78
LLC "Novomoskovsky MEZ" Dnipropetrovsk region	-0,00324	-0,000272193	17,57

Further, using the obtained coefficients of production regressions of agro-processing smart enterprises, a forecast was made of both factor characteristics and the effective indicator of the autonomy coefficient (Table 5).

**Table 5. Forecasting of factor characteristics and the effective indicator of the autonomy coefficient of agro-processing smart enterprises, 2026.**

Agro-processing enterprises	Net income from sales of products (goods, works, services), UAH thousand	Marketing expenses, UAH thousand	Autonomy coefficient
PP "Oliyar" Lviv region	11953599,20	969,35	0,67
PJSC "Chernivtsi Oil and Fat Plant"	1712031,70	1023,21	0,52
PJSC "Vinnytsia Oil and Fat Plant", Vinnytsia region	760638,00	1077,06	0,82
SEZ "Lan-Oil Trade" Ternopil region	5059756,02	1017,82	0,53
LLC "Starokostyantynivka Oil Extraction Plant" Khmelnytskyi region	920288,00	829,33	1,68
SE "Santrade" Dnipropetrovsk region	23637575,20	1475,57	10,11
LLC "Novomoskovsky MEZ" Dnipropetrovsk region	483,50	689,32	15,57

Table 5 presents the forecast for 2026 for three blocks: net sales revenue, marketing expenses, and autonomy coefficient. In terms of revenue, the following stands out: SE "Santrade" - about UAH 23.64 million thousand, which is more than twice as much as PE "Oliyar" ( $\approx$ UAH 11.95 million thousand) and almost five times as much as SEZ "Lan-Oil Trade" ( $\approx$ UAH 5.06 million thousand); the group of medium and smaller ones - PrJSC "Chernivetskyi OZHK" ( $\approx$ UAH 1.71 million thousand), LLC "Starokostyantynivskyi OEZ" ( $\approx$ UAH 0.92 million thousand) and PrJSC "Vinnytsia OZHK" ( $\approx$ UAH 0.76 million thousand). The outsider in terms of revenue is LLC "Novomoskovskiy MEZ" ( $\approx$ UAH 0.00048 million), which contrasts sharply with the rest of the sample and indicates a very narrow scale of operations or data failures. Marketing expenses in most companies are negligible relative to revenue: the estimated intensity is about 0.006% in "Suntrade", 0.008% in "Oliyar", 0.020% in "Lan-Oil Trade", 0.060% in "Chernivtsi OZHK", 0.090% in "Starokostyantynivskyi OEZ", and 0.142% in "Vinnytsia OZHK". The exception is "Novomoskovskiy MEZ", where the forecast marketing expenses ( $\approx$ UAH 689.3 thousand) exceed the revenue itself ( $\approx$ UAH 483.5 thousand), i.e., more than 142% of revenue; this is economically unsustainable and likely signals a methodological or accounting anomaly. Given the combination of low marketing intensity with very high revenue, "Suntrade" and "Oliyar" compete primarily through scale of production, supply chain effects, and positions in B2B channels, rather than through brand promotion; the middle group supports external sales with moderate investments in marketing; "Novomoskovsk MEZ" needs to verify forecast parameters or revise its business model. In general, the picture for 2026 suggests market concentration among large exporters, a stable but sensitive position of middle farmers, and the need for methodological refinement of the "autonomy coefficient" indicator, where its values exceed one. A visualization of the forecast value of the autonomy coefficient of selected agro-processing smart enterprises for the next year is presented in Figure 8.



**Figure 8. Forecasting the autonomy coefficient as an indicator of financial independence of agro-processing smart enterprises, 2026.**

Therefore, the study showed that financial management and innovative marketing in agro-processing smart enterprises not only determine their current efficiency but also act as a mechanism for long-term adaptation to global challenges. The

results emphasize that the main condition for further development is a combination of technological innovations, personnel policy, and strategic vision, which allows enterprises to form their own models of sustainability. The practical significance of the article is that it outlines the directions for strengthening the competitive positions of the industry through institutional integration, digital transformation, and efficient use of resources in the post-war period.

## DISCUSSION

The obtained results of the study confirm the key thesis that the financial sustainability of agro-processing smart enterprises is formed due to the integration of innovative marketing into strategic management. At the same time, this integration is uneven, which coincides with the conclusions of Voronina et al. (2022), which indicate the heterogeneity of the implementation of competitive strategies in different sectors of the innovative economy. This means that even within the same sphere, individual companies are able to demonstrate leadership results, while others remain at risk.

The role of investment activity, manifested through negative cash flow indicators in the largest enterprises, can be considered in the context of the research of Markina et al. (2022), where the emphasis is on resource conservation and modernization of production as a tool for increasing efficiency. This confirms the thesis that large-scale expenditures in the short term can ensure sustainable growth in the future.

The weak positions of medium-sized enterprises correlate with the conclusions of Dankevych et al. (2023), who note that integration processes and quality standards often remain a challenge for Ukrainian companies, especially those operating for export. This indicates that without proper training of personnel and a system of managerial innovations, medium-sized companies cannot ensure long-term stability.

An important factor is the digitalization of financial processes. Zhyvko et al. (2022) and Kubitskyi et al. (2024) emphasize that the transition to digital accounting models and the use of innovative technologies directly affect the financial transparency and sustainability of enterprises. In our study, this is confirmed by correlation-regression analysis models, where digital marketing and financial indicators were found to be interconnected with the autonomy coefficient.

Foreign economic factors are of particular importance. The study by Mamonova et al. (2023) on the resilience of the global food system during wartime demonstrates that dependence on exports creates both advantages and threats. This is confirmed by the results of our analysis: Suntrade and Oliyar maintain their leadership thanks to exports, but at the same time become vulnerable to global fluctuations. A similar approach is observed in Mirzoieva et al. (2024), where the production of niche crops is considered as a tool for ensuring food security.

When considering the institutional context, it is worth paying attention to the studies of Boru et al. (2025) and Dankevych et al. (2020), which show that integrated agro-industrial parks and strategic planning systems are an important component of the innovation ecosystem. In our case, this means that enterprises involved in regional clusters have a better chance of adapting to an unstable environment.

The financial and economic security of enterprises is another aspect confirmed by the works of Ruvin et al. (2020) and Bezverkhyi et al. (2019). They emphasize that transparency of reporting and data security are becoming crucial for investor confidence and business stability. This directly resonates with the results of our analysis of debt ratios: dependence on borrowed funds without proper financial security creates risks of loss of sustainability.

Finally, the study by Bielialov et al. (2024) on the role of artificial intelligence in supporting entrepreneurial initiatives of internally displaced persons opens up prospects for agro-processing companies to use the latest digital tools in marketing practices. Combining this approach with the conclusions of Holinko et al. (2023) on information systems of technological security allows us to talk about a comprehensive digital transformation of the industry.

In summary, the discussion confirms that the results of the study harmoniously fit into global scientific trends. They demonstrate that financial management of agro-processing enterprises cannot be considered in isolation from innovative marketing, digitalization, and institutional support. Only the combination of these components allows ensuring competitiveness in the long term, which is especially relevant for Ukraine in the context of war and post-war transformations.

## CONCLUSIONS

The study made it possible to establish that the combination of financial management and innovative marketing is a determining factor in ensuring the effectiveness of the trading activities of agro-processing smart enterprises. An analysis of the dynamics of financial indicators for 2020–2024 showed a significant differentiation of enterprises by scale of activity,

level of investment activity, and financing structure. Market leaders, in particular PE "Oliyar" and SE "Santrade", demonstrate strong export capabilities and financial stability; however, their high dependence on the world market creates additional risks. Medium and small enterprises, such as SEZ "Lan-Oil Trade" or LLC "Starokostyantynivsky SEZ", remain vulnerable to market fluctuations and require improvement of financial management strategies. It was found that negative cash flow indicators in large companies are not a sign of a crisis, but indicate large-scale investments in the modernization of production, which corresponds to global practices in the development of innovative business models. In contrast, positive values in small enterprises indicate a restrained investment policy, which may limit their long-term competitiveness. Autonomy coefficients confirmed the existence of two polar groups: companies that finance their activities mainly with their own resources, and enterprises dependent on borrowed capital. It is the second group that is characterized by the highest risks of loss of solvency in the event of crisis events.

A study of export activity has shown that the stability of agro-processing companies is largely determined by their integration into international markets. The largest enterprises form the main export flows, while medium-sized enterprises are focused on diversification and regional specialization. At the same time, the structure of costs for innovative marketing indicates the dominance of traditional advertising tools with insufficient use of personalized digital technologies. This reduces the potential for individual work with the consumer and limits the possibilities of long-term branding.

Correlation-regression analysis confirmed the significance of the impact of income and marketing expenses on the autonomy coefficient, which allows using these variables as indicators of financial stability. Forecasting for 2026 showed market concentration in large exporters and unstable positions of smaller companies, which requires new strategic approaches.

Practical recommendations are reduced to the need to strengthen innovative marketing through digital tools, diversify sources of financing, and introduce resource-saving technologies. It is also important to develop cluster forms of cooperation that can ensure synergy between enterprises of different scales and reduce their vulnerability to external threats.

Thus, the results of the study confirm that an integrated approach to financial management and innovative marketing is the key to the competitiveness of agro-processing smart enterprises in Ukraine and forms the basis for their sustainable development in the conditions of post-war recovery and global economic turbulence.

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## ADDITIONAL INFORMATION

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### AUTHOR CONTRIBUTIONS

*All authors have contributed equally.*

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### CONFLICT OF INTEREST

*The Authors declare that there is no conflict of interest.*

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## МЕТОДОЛОГІЯ ФІНАНСОВОГО МЕНЕДЖМЕНТУ Й ІННОВАЦІЙНОГО МАРКЕТИНГУ ТОРГОВЕЛЬНОЇ ДІЯЛЬНОСТІ АГРОПЕРЕРОБНИХ СМАРТПІДПРИЄМСТВ

У дослідженні вивчено взаємозв'язок між фінансовим менеджментом та інноваційним маркетингом у торговельній діяльності агропереробних смартпідприємств. Акцент зроблено на тому, що поєднання сучасних фінансових інструментів управління з інноваційними маркетинговими стратегіями є ключовим фактором забезпечення конкурентоспроможності й стійкості компаній у мінливому глобальному середовищі. Проведено аналіз фінансово-економічних показників провідних підприємств галузі, простежено динаміку їхньої інвестиційної активності, експортної орієнтації та особливості використання маркетингових інструментів для зміцнення ринкових позицій. Використання статистичних методів та економіко-математичного моделювання дозволило кількісно оцінити вплив чистого доходу від реалізації продукції й витрат на маркетинг на рівень фінансової автономії підприємств.

Результати дослідження показують, що підприємства, які активно впроваджують інноваційні маркетингові інструменти й поєднують їх із ефективним фінансовим менеджментом, демонструють вищий рівень фінансової стабільності, здатність адаптуватися до коливань ринку та формують передумови для довгострокового зростання. Значна увага приділена експортній діяльності як чинникові інтеграції в міжнародні ринки та підвищення фінансової автономії компаній. Показано, що великі підприємства галузі схильні до активної інвестиційної політики, яка в короткостроковій перспективі може створювати негативний грошовий потік, проте в довгостроковій перспективі забезпечує модернізацію та зміцнення конкурентних переваг.

Отже, системне поєднання фінансового менеджменту та інноваційного маркетингу в агропереробних смартпідприємствах є не просто умовою підвищення ефективності їхньої діяльності, а й стратегічним напрямом розвитку, що визначає їхню стійкість, інвестиційну привабливість і здатність забезпечувати економічну безпеку держави в умовах глобальної економічної турбулентності.

**Ключові слова:** фінансовий менеджмент, методологія, інноваційний маркетинг, агропереробні смартпідприємства, експортна діяльність, фінансова автономія

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