DOI: 10.55643/fcaptp.6.59.2024.4663

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Received: 15/10/2024
Accepted: 15/12/2024
Published: 31/12/2024

INNOVATIVE MANAGEMENT OF INTEGRATED BUSINESS STRUCTURES IN THE FINANCIAL MECHANISM OF POST-WAR RECOVERY

ABSTRACT

The article is devoted to the study of innovative management of integrated business structures in the context of the financial mechanism of post-war recovery. The emphasis is on the importance of introducing innovations into agricultural enterprises and on the possibilities of their development in the conditions of post-war recovery. The analysis and forecasting of the main indicators of the effectiveness of innovative activity of four agricultural companies that are part of the integrated group "Agroprosperis" were carried out. The dynamics of profitability, coefficients of innovative growth, activity and informatisation of work, as well as financial dependence and personnel policy of enterprises for the period 2019–2023, were studied with forecasts for 2025–2026. It was determined that the main driver of development is investments in innovative and project activities, which is especially clearly manifested in the company "Golden Dawn (agro)" LLC, which demonstrates leadership in this direction. The forecasts showed positive dynamics of growth of innovative potential, but at the same time, revealed significant differences between enterprises in terms of the level of innovative activity, financial stability and personnel policy. Recommendations are proposed for improving the innovation management system to increase the efficiency of investments in innovation in the context of ensuring a stable workforce and improving the financial stability of enterprises in the future. The results of the article emphasise the need to strengthen innovation management to ensure the sustainable development of agricultural enterprises in the context of economic recovery after the war.

Keywords: management, innovation, post-war recovery, finance, integrated structures

JEL Classification: B26, M11, O31

INTRODUCTION

The study of the system of innovative management of integrated business structures in the financial mechanism of post-war recovery is of great importance and relevance in modern conditions. The post-war period is characterised by the need not only to restore infrastructure and production facilities but also to find new approaches to managing enterprises and resources in conditions of economic instability. The introduction of innovative management models becomes a key factor for the effective use of financial and production resources, contributing to the rapid restoration of economic activity and ensuring the sustainability of enterprises. Integrated business structures that combine different business systems have a high potential for creating synergistic effects and optimising the use of resources, especially during the period of recovery from crises. At the same time, the development of new financial instruments and mechanisms that take into account the specifics of post-war recovery are an important component for attracting investments and ensuring long-term economic development. Therefore, the study of innovation management in the context of integrated enterprises in financial recovery mechanisms is key to finding optimal ways to ensure sustainable economic development and increase the competitiveness of enterprises in the global market. Continuing the study of innovation management in integrated business structures is an important stage in developing strategies for effective recovery after the war since this process requires not only stability but also the ability to quickly adapt to changing conditions. Innovations allow not only to reduce costs and increase productivity but also to ensure the stability of economic systems, which is especially important in conditions of resource scarcity

and instability of financial flows. Integration of enterprises through joint initiatives, such as consortia, clustering, strategic alliances or partnerships, allows for the creation of more effective mechanisms for coordinating and implementing innovation projects, which makes it possible not only to reduce the risks associated with market fluctuations but also to increase the level of technological readiness of enterprises for future challenges. Special attention in this context should be paid to financial instruments that contribute to stimulating investment in innovation and recovery. The development of new forms of financing, such as state support programs, venture investments, international grants and loans, allows not only to ensure the rapid restoration of production capacities, but also to integrate innovative solutions for the development of the economy as a whole. In addition, integrated business structures in the conditions of recovery can become important platforms for the implementation of new technologies and innovative solutions. For example, in such conditions, advanced business models, such as digitalisation, green economy, and automation of production, can be implemented more quickly, which will positively affect the growth of productivity and competitiveness.

LITERATURE REVIEW

Consider a study that is directly related to the innovative management of integrated business structures in the financial mechanism of post-war recovery. For example, the work (Starostina et al., 2023) reveals the essence of an entrepreneurial university in wartime, which can serve as a basis for developing educational strategies in the post-war period. In turn, (Khaddour and Deng, 2023) analyse multi-criteria risk management for housing reconstruction, which creates an important context for integrating innovative approaches into the housing and communal services sector.

The scientific work (Leal Filho et al., 2023) investigates medical waste management in Ukraine, which correlates with an innovative approach to sustainable development, in particular in the field of health care during recovery. Scientists (Gryshchenko et al., 2021) analyse the advantages of a university educational innovation cluster, which can be useful for implementing the latest methods in business structures.

Scholars (Gill, 1992) focus on the globalisation of the economy, which sets the strategic context for financial recovery mechanisms. Also, the work of (Aranchiy et al., 2020) and others offers innovative approaches to the management of ecological enterprises, which can be integrated into economic recovery mechanisms through entrepreneurial structures focused on ecological sustainability. Thus, all these studies form the basis for the development of innovative management, which takes into account both global trends and local challenges, contributing to the financial stability and recovery of the Ukrainian economy. The presented studies reveal important aspects of innovative management, which are relevant for integrated entrepreneurial structures in the financial mechanism of post-war recovery. For example, (Nielsen et al., 2023) analyse the impact of disasters on international business, which can be used to develop strategies for the recovery of enterprises in unstable conditions.

Some scientists (Kyryliuk et al., 2021) investigate organisational and economic factors for ensuring the safety and improving the quality of livestock products, which is an example of the adaptation of the agricultural sector to new challenges. Some scientists (Turnheim and Geels, 2013) draw attention to the destabilisation of existing regimes, which correlates with the need to introduce new management mechanisms to ensure sustainable development in the post-war period. Scientists (Zolkover and Ovcharenko, 2024) focus on modelling the assessment of the level of innovation security, which directly relates to financial mechanisms for ensuring the sustainability of business structures. Scientists (Devlin et al., 2024) develop a technical and economic optimisation of steel supply chains in the context of the transition to clean energy, which meets the needs of infrastructure modernisation.

Colleagues (Mikhno et al., 2022) analyse digital globalisation in the international development of strategic alliances, which contributes to effective coordination between enterprises. The scientist (Etzkowitz, 2017) explores the concept of an entrepreneurial university, which can become the basis for innovation clusters. Finally (Balanovska et al., 2018) consider the competencies of entrepreneurs in the development of rural areas, which is relevant for economic recovery at the regional level. Thus, all these works contribute to the formation of a scientific basis for the effective implementation of innovation management in the process of post-war economic recovery of Ukraine.

The presented studies consider various aspects related to the innovative management of integrated business structures in the financial mechanism of post-war recovery, so (Pascariu et al., 2023) focus on regional knowledge necessary for the restoration of the spatial economy of Ukraine, which forms the basis for the development of effective strategies for managing business structures. The features of the development of agrarian entrepreneurship are studied (Balanovska et al., 2022), which contributes to the adaptation of business structures to challenges in the agricultural sector.

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The work (Oseredchuk et al., 2022) is devoted to monitoring the quality of higher education in the process of distance learning, which is important for the training of qualified specialists who can ensure the management of innovative structures. Scientists (Golubchikov and Deda, 2012) propose an integrated policy framework for energy-efficient housing, which can be used to modernise infrastructure in the recovery period.

The work (Voznyuk et al., 2021) is relevant to the innovative management of integrated business structures in the financial mechanism of post-war recovery, as it emphasises the importance of developing new approaches to learning. The use of interdisciplinary methods can contribute to the preparation of specialists who are able to manage complex structures, integrating innovative practices into business models. The study (Kruk et al., 2010) focuses on the restoration of health systems in post-conflict countries, which is directly related to the creation of effective financial mechanisms within the framework of post-war recovery since a stable health system is key to maintaining the working capacity of the population and ensuring social sustainability. In the context of innovative management, the results of this study can serve as a basis for integrating entrepreneurial structures into the healthcare sector, developing new business models, and attracting financing for their implementation.

Scientists (Vasylchak et al., 2022) analyse state regulation of employment in the context of innovative entrepreneurship development, which creates opportunities for optimising labour resources. The article (Saeed et al., 2022) examines the reconstruction of Mosul after the war with the Islamic State, in particular, the reconstruction of housing, which may be related to post-war recovery processes in which innovative approaches in management and finance can be used. Although the main focus is on housing reconstruction, aspects of organisational structures and financial mechanisms can be useful for understanding managerial innovations in the context of post-war recovery.

Researchers (Raskin et al., 2017) propose financial recovery mechanisms and methodological approaches to data analysis and can be applied in the management of financial and entrepreneurial structures during post-war recovery, in particular for the analysis of financial flows or optimisation of resource allocation.

A scientific paper (Pysarenko et al., 2020) focuses on data in marketing logistics business models, which can be useful for creating innovative business models within the framework of recovery. Using data to improve logistics, including in agro-industry or other sectors in need of recovery, can be important for the financial mechanisms of post-war recovery. Research (Kharazishvili et al., 2022) develops strategic scenarios for the sustainable development of air transport, which is important for the integration of innovative solutions in the transport sector. Thus, these works create a theoretical and practical basis for the implementation of innovation management in post-war reconstruction, contributing to the sustainable development of business structures.

The work (Skydan et al., 2022) deals with the topic of innovation management in integrated business structures and financial mechanisms for post-war recovery, which is likely to be directly relevant to your topic. Such an approach may include research into innovation management methods that are necessary for the effective recovery of economic and financial infrastructure after war. For example, integrated business structures that combine different types of enterprises or financial instruments can be important for ensuring resilience and accelerating recovery in the post-conflict period. The presented studies make a significant contribution to understanding the aspects of innovation management of integrated business structures that are critical for the development of a financial mechanism for post-war recovery.

Scientists (Porfirenko et al., 2023) investigate ways to optimise the mobility of passenger transportation in megacities, which is relevant for improving transport infrastructure in recovery conditions. The authors (Mihus and Zaiets, 2024) focus on forecasting the current assets of enterprises to ensure financial security, which is the basis for preventing bankruptcies and stabilising economic structures. Scientists (Hall et al., 2016) consider financing mechanisms for the public energy sector that can be adapted to attract resources in the post-war energy sector. Scientists (Khodakivska et al., 2022) model the management of economic security of innovative entrepreneurship, which forms a conceptual framework for integrating innovations into regional recovery.

The works of scientists (Sutrisno et al., 2014) are interesting for our article in terms of methodology and tools. In addition, (Koshova et al., 2024) investigate the financing of space activities in wartime, proposing solutions to support high-tech sectors of strategic importance. The work (Kompanets et al., 2022), which concerns the simulation modelling of the distribution of rights and management systems for the innovative development of enterprise personnel under the influence of COVID-19 pandemic factors, may have some relevance to the topic "Innovative management of integrated business structures in the financial mechanism of post-war recovery", but through several indirect connections. Scientists (Karmaker et al., 2023) analyse the impact of technologies on the productivity of a sustainable supply chain, which correlates with

innovations in logistics management. Scientists (Bolton, 2024) analyse non-standard approaches to the management process in times of crisis. Finally (Stolyarov et al., 2022) work on optimising logistics, which contributes to increasing the efficiency of industrial enterprises in difficult economic conditions.

Scientists (Skydan et al., 2022) on the implementation of the experience of the European Green Deal in ensuring food security in Ukraine has a significant bearing on the topic of innovative management of integrated business structures in the financial mechanism of post-war recovery. Such studies emphasise the importance of integrating environmentally oriented strategies into business models, which contributes to sustainable development, in particular in the agro-industrial sector. The use of Green Deal approaches can strengthen the resilience of enterprises and increase the efficiency of resource use in post-war conditions. The article (Antonelli et al., 2014) studies the mechanisms of knowledge management through state-owned enterprises and their impact on economic growth in Italy after 1950. Although this study addresses the historical context and the specificities of the public sector, its findings can be useful in understanding how public management and innovative approaches can be used in financial mechanisms for post-conflict recovery. Knowledge management and public enterprises can play a key role in economic recovery, especially in post-conflict countries where a new approach to infrastructure and business is needed.

Maconachie et al. (2012) examine the impact on urban agriculture, youth and food security in post-conflict Freetown, Sierra Leone. It is directly relevant to post-conflict recovery as it examines how entrepreneurial structures (particularly agricultural enterprise associations) can be important for restoring economic activity and ensuring food security. Innovative management of such structures can help in introducing new business practices in post-conflict economies, as well as in involving youth in recovery processes.

Scholars (Chen et al., 2024) review policies in China's automotive industry, which may be less directly related to post-conflict recovery but can provide valuable lessons on managing innovation in strategic sectors that have a large impact on economic growth. Innovation in industrial sectors, such as the automotive industry, can be applied to the recovery of important sectors of the economy in post-conflict countries, especially when it comes to integrating entrepreneurial structures into financial recovery mechanisms. Scholars (Gaevska, 2017) have proposed indicators for assessing the use of innovation potential, which are also used in our article.

Overall, further research should focus on the synergy between innovation, entrepreneurship and financial mechanisms to create sustainable and effective recovery models in post-conflict economies, which will ensure not only economic but also social stability through supporting local enterprises, involving young people and adapting to new conditions.

AIMS AND OBJECTIVES

The purpose of the article is to study the innovation management of integrated business structures in the agricultural sector in the context of the financial mechanism of post-war economic recovery, as well as to analyse the impact of innovation activity on the efficiency of the work of agricultural enterprises that are part of the integrated group, with a forecast of their development for the coming years.

Objectives of the article:

- to analyse the role of innovation management in agricultural enterprises in the processes of post-war economic recovery;
- to study the financial and economic indicators of the efficiency of innovation activity of agricultural companies of the integrated group "Agroprosperis" for the period 2019–2023;
- to forecast the main indicators of the efficiency of innovation activity of agricultural enterprises for 2025–2026;
- to identify key factors that affect the innovative activity of enterprises and their financial stability;
- to assess the role of personnel policy in the implementation of innovative projects at agricultural enterprises;
- to develop recommendations for improving innovation management to increase the efficiency of investments in the agricultural industry in the conditions of post-war recovery.

METHODS

The main method of our scientific research is taxonomic. The use of the taxonomic analysis method in the context of innovative management of integrated business structures in the financial mechanism of post-war recovery is an important

DOI: 10.55643/fcaptp.6.59.2024.4663

tool for systematising and assessing the effectiveness of various management strategies in post-conflict recovery. Taxonomic analysis allows you to classify enterprises by key indicators, such as the level of innovative activity, technological readiness, financial stability and resource efficiency. The use of this method helps to identify optimal approaches to integrating enterprises into a single system, which helps to maximise synergistic effects and reduce risks during economic recovery. The taxonomic analysis method allows you to divide enterprises into classes corresponding to different levels of innovative development and financial stability, which is critically important for developing effective recovery policies. This approach makes it possible to identify enterprises with high potential for rapid adaptation to changes in the external environment, as well as those that require additional support in financial or technological aspects. Taxonomic analysis also provides the opportunity to build forecasting models that take into account various recovery factors, including political, economic and social aspects. The application of this method in the financial mechanism of recovery allows authorities and investors to make more informed decisions on financing and supporting enterprises, focusing on the real state of each enterprise, which allows for the creation of a system that uses limited resources as efficiently as possible to restore the national economy and ensure the stable development of enterprises in the post-crisis period. Thus, taxonomic analysis becomes an important tool for ensuring strategic management in the process of post-war recovery, allowing not only to assess the current state of enterprises but also to form forecasts of their development in a changing financial environment.

In our case, it is necessary to conduct a taxonomic analysis of the indicators of innovative activity of agricultural enterprises of the integrated business structure of the company "Agroprosperis" for the last five years, in particular: the level of profitability of the production of innovative agricultural products, the coefficient of innovation growth, the coefficient of innovation activity, the coefficient of informatisation of work, the coefficient of financial dependence of innovative activity, the coefficient of turnover of personnel engaged in innovative development and the profitability of permanent capital. The adaptation of the taxonomic assessment is presented by five Ukrainian innovative associations: "Golden Dawn (Agro)"; "Bio Agro"; "Rei Agro"; "Latagro"; "New Agro Management". Namely, on the basis of their accounting and financial reporting for the last five years (borrowed from the site https://clarity-project.info/), we will study the state of innovative management of integrated business structures in the financial mechanism of post-war recovery using the method of taxonomic analysis. The main indicators of innovation management in dynamics have been proposed for taxonomic analysis; an example is the innovation growth coefficient. The innovation growth coefficient shows the rate of change and the efficiency of implementing innovations in the activities of an enterprise or economic system. It is a quantitative indicator that allows us to assess how successfully an enterprise or industry uses innovative developments to ensure its development, increase competitiveness and increase economic indicators. A high innovation growth coefficient indicates that an enterprise or system actively uses the potential of innovations for development, while a low coefficient may signal the need to improve approaches to innovation management.

The profitability of permanent capital is a financial indicator that reflects the efficiency of using long-term (permanent) sources of financing of an enterprise to generate profit. This indicator shows how profitably an enterprise uses its own capital and long-term liabilities, which form the basis of its financial stability. In our case, the use of the taxonomic analysis method is a method of quantitative assessment of objects, aimed at classifying and ordering according to certain characteristics. The stages of taxonomic analysis calculation allow you to evaluate complex systems, identify the main trends and classify objects for effective decision-making. Stages of taxonomic analysis calculation:

1. A set of objects to be assessed is selected and the purpose of the analysis is established, for example, assessing the level of innovativeness of enterprises or the efficiency of resource use.
2. Key indicators (criteria) are determined that characterise the objects of analysis, such indicators must be measurable, relevant to the purpose of the study and independent of each other.
3. Indicators are normalised, since indicators can be presented in different units of measurement, they must be brought to a comparable form.
4. A reference object is calculated, according to which an "ideal" object (reference) is created, which has the best values of all indicators (maximum for stimulants and minimum for de-stimulators).
5. The distances between objects and the reference are determined, at which the euclidean distance of each object from the reference is calculated.
6. Calculation of distances between objects and the reference, which are calculated as the euclidean distance of each object from the reference.

7. Interpretation of the results, where the objects are classified by level of development based on the obtained coefficients, while the strengths and weaknesses of the objects are determined, recommendations for improvement are formed.

The authors' own development is the forecasting of the taxonomic indicator of the effectiveness of innovative activity for the next period.

In the first stage, we build a matrix of standardised indicators of innovative activity of the presented agricultural enterprises (Zij) for the last five years (Table 1).

Table 1. Matrix of standardised indicators of innovation activity of agricultural enterprises, 2019-2023. (Source: calculated by the authors taking into account the financial statements of enterprises https://clarity-project.info/)

Years	Level of profitability of production of innovative agricultural products, %	Innovation growth rate	Innovation activity coefficient	Coefficient of informatisation of works	Coefficient of financial dependence of innovation activity	Turnover rate of personnel engaged in innovative development, %	Return on permanent capital, %
LLC "Golden Dawn (agro)"							
2019	1.25	-1.01	-1.40	-1.53	1.75	0.75	-0.44
2020	0.87	-0.89	-0.28	-0.41	-0.19	1.37	-0.78
2021	-0.34	0.27	0.06	0.26	-0.67	-0.90	-0.93
2022	-0.94	0.20	0.22	0.78	-0.58	-0.51	1.10
2023	-0.83	1.44	1.39	0.91	-0.31	-0.70	1.05
LLC "Rey Agro"							
2019	-1.45	0.57	0.99	-1.29	-1.68	-1.39	-1.09
2020	-0.43	1.14	1.03	-0.77	-0.07	-0.61	-1.10
2021	0.58	0.26	-0.03	1.03	0.55	0.17	0.70
2022	0.14	-1.41	-1.04	0.26	0.32	0.96	0.78
2023	1.16	-0.56	-0.95	0.77	0.88	0.87	0.70
LLC "Latagro"							
2019	-1.38	1.55	1.76	-0.44	-1.09	-1.39	-1.79
2020	-0.36	0.48	-0.12	-1.53	-0.93	-0.62	0.46
2021	-0.13	-0.65	-0.54	0.44	0.15	0.27	0.45
2022	0.62	-0.70	-0.55	0.55	0.62	1.08	0.44
2023	1.25	-0.68	-0.55	0.98	1.24	0.66	0.44
LLC "New Agro Management"							
2019	-1.35	-0.98	0.87	-1.07	-1.61	1.34	1.12
2020	-0.45	-0.96	0.71	-0.93	0.23	0.30	1.06
2021	-0.09	0.02	-1.24	0.11	0.69	-0.73	-0.65
2022	0.63	0.57	-0.93	0.65	-0.23	0.30	-0.83
2023	1.26	1.34	0.58	1.24	0.92	-1.21	-0.70

At the next stage, it is possible to conditionally divide the indicators of the efficiency of the innovative activity of agricultural enterprises, which directly or indirectly affect the effectiveness of the activities of business entities as follows:

- level of profitability of the production of innovative agricultural products, % Stimulator (resultant indicator of the innovative activity of agricultural enterprises);
- coefficient of innovative growth Stimulator (positive factor of influence on the innovative activity of agricultural enterprises);

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- coefficient of innovative activity, Stimulator (positive factor of influence on the innovative activity of agricultural enterprises);
- coefficient of informatisation of works, Stimulator (positive factor of influence on the innovative activity of agricultural enterprises);
- coefficient of financial dependence of innovative activity, Stimulator (positive factor of influence on the innovative activity of agricultural enterprises);
- coefficient of turnover of personnel engaged in innovative development %, Destimulator (negative factor of influence on the innovative activity of agricultural enterprises);
- profitability of permanent capital, % Destimulator (indirect factor of influence on the innovative activity of agricultural enterprises).

We emphasise that such a division is conditional and is based solely for calculations using the method of taxonomic analysis of the innovative activity of business entities (Table 2).

Table 2. Definition of the reference vector for calculation by the method of taxonomic analysis of innovative activity of business entities, 2019-2023.
(Source: calculated by the authors taking into account the financial statements of enterprises https://clarity-project.info/)

Years	Level of profitability of production of innovative agricultural products, % Stimulator	Innovation Growth Factor Stimulator	Innovation activity coefficient Stimulator	Coefficient of informatisation of works Stimulator	Coefficient of financial dependence of innovation activity Stimulator	Turnover rate of personnel engaged in innovative development % Demotivator	Return on permanent capital, % Disincentive
LLC "Golden Dawn (agro)"							
Standard (Z_{0j}) (stimulator – max)	30.71	0.92	85.07	36.40	3.62	X	X
Standard (Z_{0j}) (destimulator – min)	X	X	X	X	X	9.60	1.22
LLC "Rey Agro"							
Standard (Z_{0j}) (stimulator – max)	27.54	0.03	0.37	21.18	2.08	X	X
Standard (Z_{0j}) (destimulator – min)	X	X	X	X	X	10.10	0.03
LLC "Latagro"							
Standard (Z_{0j}) (stimulator – max)	25.17	0.67	6.28	21.15	2.24	X	X
Standard (Z_{0j}) (destimulator – min)	X	X	X	X	X	10.56	0.11
LLC "New Agro Management"							
Standard (Z_{0j}) (stimulator – max)	25.64	0.10	1.44	22.59	1.72	X	X
Standard (Z_{0j}) (destimulator – min)	X	X	X	X	X	8.94	1.38

Next, using the classical method of taxonomic evaluation, the distances between individual indicators of innovative activity of agricultural enterprises and the reference vector (Ci0) were determined using the formula described in the work (Ivanova, 2016):

$$C_{i0} = \sqrt{\sum_{i=1}^{m}(Z_{ij} - Z_{0j})^2} \quad (1)$$

The following calculation of the values, which are the input values used to calculate the taxonomic indicator of innovative activity of integrated business structures over the last five years:

1. Average distance:

$$\bar{C}_0 = \frac{1}{m}\Sigma_{i=1}^{m} C_{i0} \quad (2)$$

2. Standard deviation:

$$S_0 = \sqrt{\frac{1}{m}\Sigma(C_{i0} - \bar{C}_0)^2} \quad (3)$$

3. Total distance between indicators and the standard:

$$C_0 = \bar{C}_0 + 2S_0 \quad (4)$$

4. Deviation of indicators of the i-th year from the standard:

$$d_i = \frac{C_{i0}}{C_0} \quad (5)$$

Finally, we determine the taxonomic indicator of innovative activity of integrated business structures over the last five years:

$$K_i = 1 - d_i \quad (6)$$

Table 3. Calculation of the taxonomic indicator of innovative activity of integrated business structures, 2019-2023. *(Source: calculated by the authors taking into account the financial statements of enterprises https://clarity-project.info/)*

Years	Level of profitability of production of innovative agricultural products, %	Innovation growth rate	Innovation activity coefficient	Coefficient of informatisation of works	Coefficient of financial dependence of innovation activity	Turnover rate of personnel engaged in innovative development, %	Return on permanent capital, %
LLC "Golden Dawn (agro)"							
2019	0.665	0.565	0.525	0.469	0.370	0.313	0.245
2020	0.685	0.595	0.565	0.496	0.374	0.327	0.255
2021	0.705	0.625	0.605	0.523	0.378	0.341	0.265
2022	0.725	0.655	0.645	0.550	0.382	0.355	0.275
2023	0.745	0.685	0.685	0.577	0.386	0.368	0.286
LLC "Rey Agro"							
2019	0.655	0.555	0.515	0.455	0.365	0.305	0.235
2020	0.675	0.585	0.555	0.485	0.375	0.315	0.245
2021	0.695	0.615	0.595	0.515	0.365	0.335	0.255
2022	0.715	0.645	0.635	0.545	0.375	0.345	0.265
2023	0.735	0.675	0.675	0.565	0.375	0.355	0.275
LLC "Latagro"							
2019	0.645	0.545	0.505	0.445	0.355	0.295	0.225
2020	0.665	0.575	0.545	0.475	0.365	0.305	0.235
2021	0.685	0.605	0.585	0.505	0.355	0.325	0.245
2022	0.705	0.635	0.625	0.535	0.365	0.335	0.255
2023	0.725	0.665	0.665	0.555	0.365	0.345	0.265
LLC "New Agro Management"							
2019	0.635	0.535	0.495	0.435	0.345	0.285	0.215
2020	0.655	0.565	0.535	0.465	0.355	0.295	0.225
2021	0.675	0.595	0.575	0.495	0.365	0.315	0.235
2022	0.715	0.625	0.615	0.525	0.357	0.325	0.245
2023	0.724	0.655	0.655	0.545	0.356	0.335	0.255

DOI: 10.55643/fcaptp.6.59.2024.4663

The application of the taxonomic analysis method allows us to calculate the integral indicator of innovative management of integrated business structures and offer a forecast and recommendations for the development of integrated business structures in the financial mechanism of post-war recovery.

RESULTS

As a result of the implementation of the taxonomy method, it is possible to interpret the innovative activity of integrated business structures over the past five years. Analysis of the table, which reflects the calculation of the taxonomic indicator of innovative activity of integrated business structures for 2019–2023, demonstrates a gradual increase in the efficiency of innovative management in all the companies considered. In the dynamics of the indicators, a steady trend of improvement of key characteristics is observed, which indicates adaptation to innovation challenges and gradual integration of new approaches to management. In all enterprises included in the analysis, the level of profitability of the production of innovative agricultural products, the innovation growth coefficient and other key indicators are increasing, which indicates the effective implementation of the latest technologies and improved management of innovative development processes. In particular, LLC "Golden Dawn (agro)" demonstrates the most pronounced positive trend in most indicators, which may indicate the high efficiency of the implemented innovation strategies. The coefficient of innovation activity, which characterises the level of involvement of enterprises in innovation processes, is gradually increasing in all companies, which may be the result of increased investment in research and development or improved organisational conditions for innovation. The coefficient of informatisation of work also has a stable growth, which confirms the wider use of digital technologies to optimise business processes. The coefficient of financial dependence of innovation activity has a slight change in dynamics, which indicates a stable financing structure, which allows enterprises to avoid critical risks associated with external sources of capital. At the same time, the turnover rate of personnel engaged in innovative development is increasing noticeably, which may indicate the need to improve personnel policies aimed at retaining qualified employees. The profitability of permanent capital also demonstrates growth, which indicates a more efficient use of long-term resources to generate profit, which is an important indicator of the stability and resilience of enterprises. Thus, the results of the analysis indicate the overall positive dynamics of the innovative development of the enterprises under consideration, although certain aspects, in particular personnel stability, require additional attention to ensure sustainable long-term growth.

If we divide the analysis by enterprises, we will obtain a picture for each enterprise.

In particular, LLC "Golden Dawn (agro)" demonstrates the highest indicators among the analysed companies in all key aspects. The profitability of the production of innovative products increases from 0.665 in 2019 to 0.745 in 2023, which indicates a constant increase in the efficiency of using innovations in production. The innovation growth coefficient increased from 0.565 to 0.685, reflecting the progressive introduction of new technologies and improvement of development strategies. The innovation activity coefficient increased from 0.525 to 0.685, which indicates an increase in the volume of innovative activity and the involvement of the enterprise in the innovation environment. The coefficient of informatisation of works reached 0.577 in 2023, which indicates a significant level of digitalisation of processes. The coefficient of financial dependence remains stable with a slight increase, which ensures the financial stability of the enterprise. The turnover coefficient increased from 0.313 to 0.368, which may be caused by personnel changes in the field of innovative development. The profitability of permanent capital is steadily increasing, reaching 0.286 in 2023, which indicates the effective use of long-term resources.

The enterprise "Rei Agro" LLC demonstrates similar dynamics but with slightly lower indicators compared to "Golden Dawn". The profitability of innovative products increased from 0.655 to 0.735. The coefficient of innovative growth increased from 0.555 to 0.675, reflecting active development. The coefficient of innovative activity increased from 0.515 to 0.675, indicating an increase in innovative potential. The coefficient of informatisation of work increased to 0.565, indicating a positive dynamic of digitalisation. The coefficient of financial dependence remained relatively stable. The coefficient of staff turnover is increasing, which may be a consequence of staff instability. The profitability of permanent capital reached 0.275, demonstrating a stable improvement in the use of financial resources.

The enterprise LLC "Latagro" has the lowest indicators among all analysed companies but demonstrates gradual progress. The profitability of innovative product production increased from 0.645 to 0.725. The innovation growth coefficient increased from 0.545 to 0.665, which indicates a moderate introduction of innovations. The innovation activity coefficient rose from 0.505 to 0.665. The coefficient of informatisation of work reached 0.555, indicating an improvement in the digital component of the enterprise's work. The coefficient of financial dependence demonstrates stability without significant changes. The turnover coefficient remains lower than that of other enterprises, but its growth may signal insufficient attention to personnel policy. The profitability of permanent capital is improving, reaching 0.265 in 2023.

The New Agro Management LLC enterprise demonstrates a growth trend, although slower than that of the leaders. The profitability of innovative products increased from 0.635 to 0.724. The innovation growth coefficient increased from 0.535 to 0.655. The innovation activity coefficient improved from 0.495 to 0.655. The work informatisation coefficient increased to 0.545, demonstrating the stable implementation of digital technologies. The financial dependence coefficient remained relatively stable, which is a positive factor. The staff turnover coefficient has a slight increase, which may indicate problems with staff retention. The profitability of permanent capital reached 0.255 in 2023.

So, all enterprises demonstrate positive dynamics of indicators. However, LLC "Golden Dawn (agro)" has the highest results, which indicates leadership in the implementation of innovations. The remaining companies are gradually adapting to innovative conditions, although difficulties are observed in some aspects, particularly personnel stability. In general, the results indicate an improvement in the efficiency of innovative activity in all enterprises.

Before forecasting the taxonomic indicator of integrated business structures of the company "Agroprosperis" for the next period, let's analyse and forecast the cost indicators of agricultural enterprises: net income from sales of products (goods, works, services), gross profit (loss) and expenses for innovation and project activities. The dynamics of the cost indicators of agricultural enterprises and their graphical representation and comparison for the last studied period are presented in Figures 1-3. We observe an increase in the cost indicators of innovative activity of agricultural integrated business structures for the project period, which can be a positive phenomenon in the complex of all activities of agricultural enterprises.

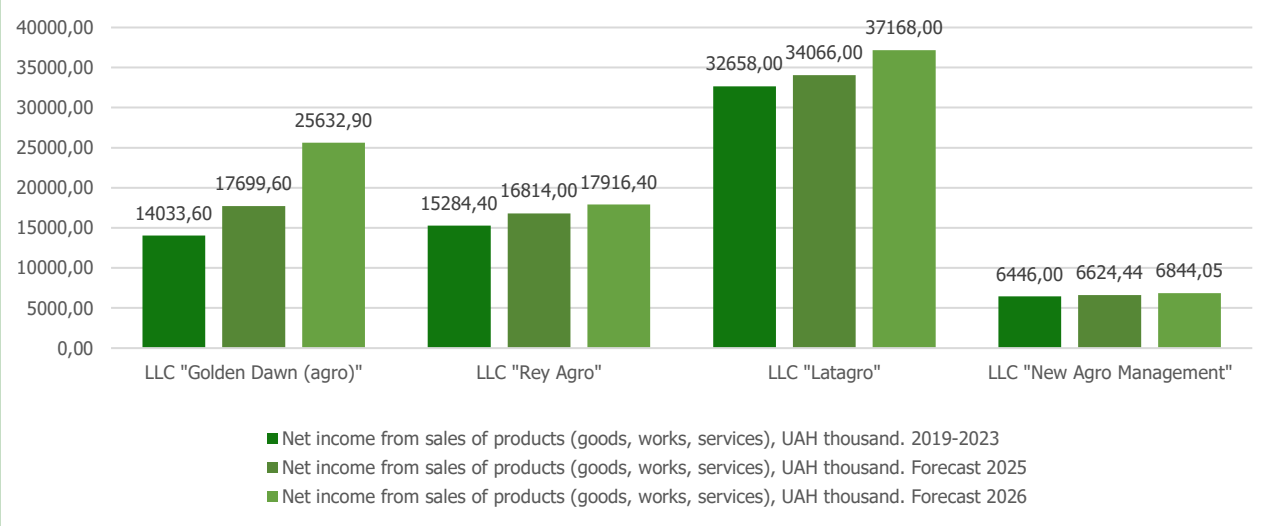

Figure 1. Dynamics and forecast of net income from sales of products (goods, works, services) of agricultural integrated business structures, 2019-2023, 2025-2026. *(Source: forecast calculated by the authors taking into account the financial statements of enterprises https://clarity-project.info/)*

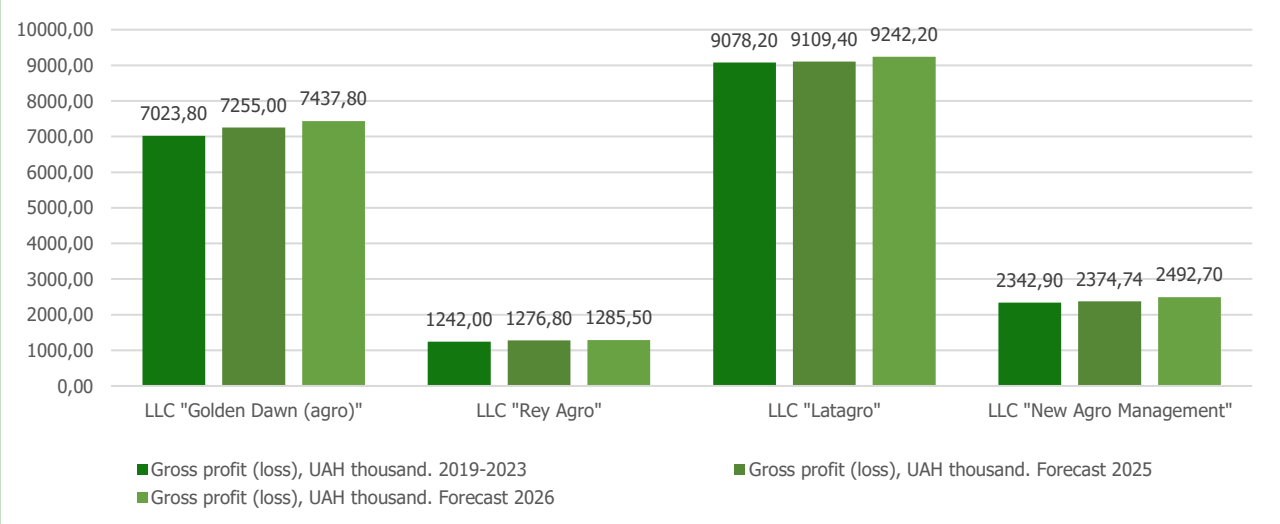

Figure 2. Dynamics and forecast of gross profit of agricultural integrated business structures, 2019-2023, 2025-2026. *(Source: forecast calculated by the authors taking into account the financial statements of enterprises https://clarity-project.info/)*

DOI: 10.55643/fcaptp.6.59.2024.4663

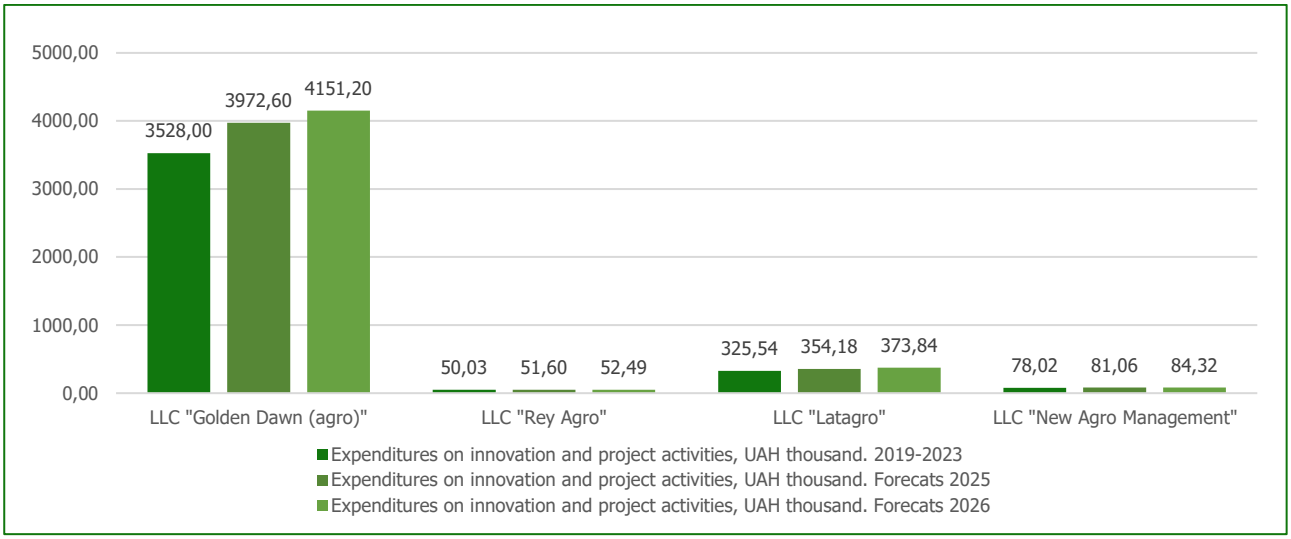

Figure 3. Dynamics and forecast of costs for innovation and project activities of agricultural integrated business structures, 2019-2023, 2025-2026. *(Source: forecast calculated by the authors taking into account the financial statements of enterprises https://clarity-project.info/)*

A detailed analysis of the dynamics of the cost indicators of the activities of agricultural enterprises in the Agroprosperis group of companies for the period 2019–2023 and forecasts for 2025–2026 allows us to assess the financial stability and management efficiency of each enterprise. Golden Dawn (agro) LLC demonstrates stable financial development with a strong emphasis on innovative and project activities. Net sales revenue increased from UAH 14,033.60 thousand in 2019–2023 to the projected UAH 25,632.90 thousand in 2026, which indicates an increase in demand for products and efficient use of resources. Gross profit also increased from UAH 7,023.80 thousand to UAH 7,437.80 thousand. A slight increase in profit indicates stable cost control. Expenditures on innovation and project activities are the largest among enterprises, reaching UAH 4,151.20 thousand in 2026, which indicates the priority of innovations in the enterprise's strategy. The enterprise "Rey Agro" LLC demonstrates low innovation activity and moderate financial growth. Net sales revenue increases from UAH 15,284.40 thousand to UAH 17,196.40 thousand in 2026, but the growth rate is the slowest among all enterprises. Gross profit increases slightly - from UAH 1,242.00 thousand to UAH 1,285.50 thousand, which indicates low business margins. Innovation expenses remain the lowest, only UAH 52.49 thousand in 2026, which may indicate insufficient attention to innovative development. The company "Latagro" LLC demonstrates the highest net income and stable growth in indicators. Net sales revenue increased from UAH 32,658.00 thousand to UAH 37,168.00 thousand in 2026, which is the highest indicator among all companies. Gross profit also increases from UAH 9,078.20 thousand to UAH 9,242.20 thousand. Innovation costs, although remaining relatively small (UAH 373.84 thousand in 2026), show a gradual increase, which indicates a certain interest in innovative development. For "New Agro Management", LLC demonstrates the lowest financial indicators but is also growing. Net sales revenue increased from UAH 6,446.00 thousand to UAH 6,844.05 thousand in 2026. The increase in income is the smallest among all companies. Gross profit increases from UAH 2,342.90 thousand to UAH 2,492.70 thousand, which indicates stable profitability, albeit at a low level. Innovation costs increased from UAH 78.02 thousand to UAH 84.32 thousand, which indicates moderate innovation activity.

Thus, LLC "Golden Dawn (agro)" is the leader in costs for innovation and project activities, which emphasises its strategic focus on innovation. LLC "Latagro" has the highest net income and gross profit, which indicates the scale of its activities. LLC "Rei Agro" and LLC "New Agro Management" demonstrate a low level of innovation costs, which may limit their future development. Forecasts for 2025–2026 indicate the continuation of current trends, with a gradual increase in income, profits and innovation investments. However, individual companies need to strengthen the innovation component to ensure competitiveness. At the final stage, the taxonomic indicator of the innovative activity of agricultural integrated business structures, its graphical representation and comparative summary analysis for the next two years were forecasted. The forecasting of these indicators was carried out by the authors and is a proposal for improving the innovation management system of integrated business structures in the financial mechanism of post-war recovery and the formation of goals for the comprehensive activity of business entities. Thus, the taxonomic indicator of the innovative activity of agricultural enterprises was forecasted using a built-in predictive statistical function that shows that the coefficient indicators of innovativeness are growing and approaching the normalised value of 1, which can be a positive and effective phenomenon (Table 4).

Table 4. Forecast of the taxonomic indicator of innovative activity of agricultural integrated business structures, 2025-2026. *(Source: forecast calculated by the authors taking into account the financial statements of enterprises https://clarity-project.info/)*

Years	Level of profitability of production of innovative agricultural products, %	Innovation growth rate	Innovation activity coefficient	Coefficient of informatisation of works	Coefficient of financial dependence of innovation activity	Turnover rate of personnel engaged in innovative development, %	Return on permanent capital, %
LLC "Golden Dawn (agro)"							
2025	0.785	0.745	0.765	0.631	0.394	0.396	0.306
2026	0.805	0.775	0.805	0.658	0.398	0.409	0.316
LLC "Rey Agro"							
2025	0.775	0.735	0.755	0.625	0.379	0.383	0.295
2026	0.795	0.765	0.795	0.653	0.381	0.396	0.305
LLC "Latagro"							
2025	0.765	0.725	0.745	0.615	0.369	0.373	0.285
2026	0.785	0.755	0.785	0.643	0.371	0.386	0.295
LLC "New Agro Management"							
2025	0.776	0.715	0.735	0.605	0.366	0.363	0.275
2026	0.800	0.745	0.775	0.633	0.368	0.376	0.285

Visualisation of the forecast values of the taxonomic indicator of innovative activity of agricultural integrated business structures is presented in Figures 4-7.

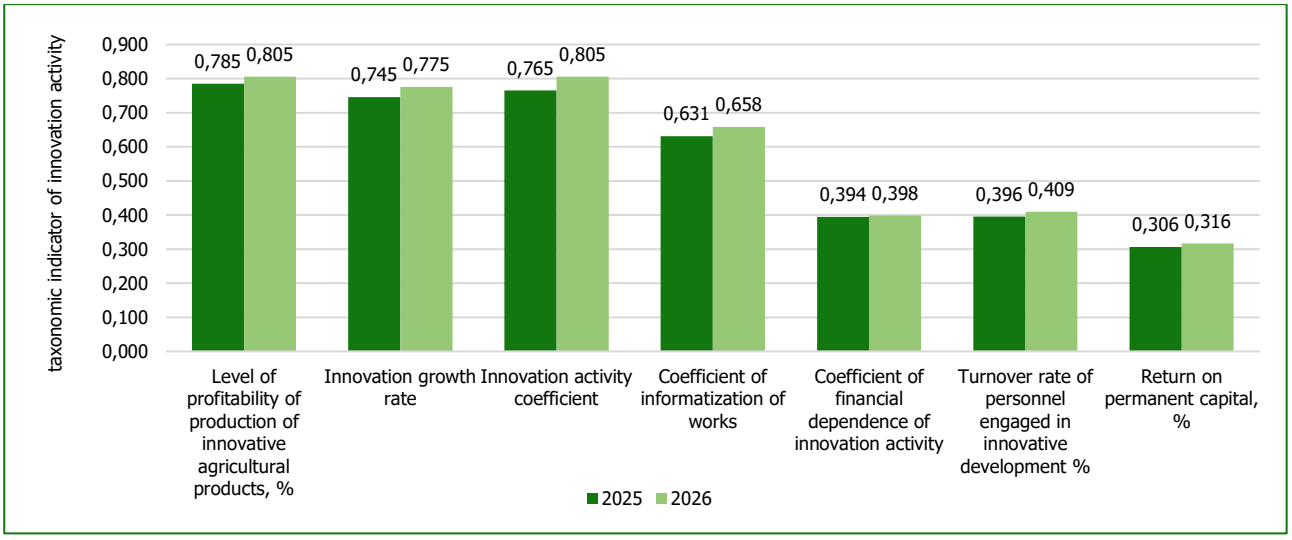

Figure 4. Forecasting the taxonomic indicator of innovative activity of LLC "Golden Dawn (agro)" of the integrated business structure of the company "Agroprosperis", 2025-2026. *(Source: forecast calculated by the authors taking into account the financial statements of enterprises https://clarity-project.info/)*

DOI: 10.55643/fcaptp.6.59.2024.4663

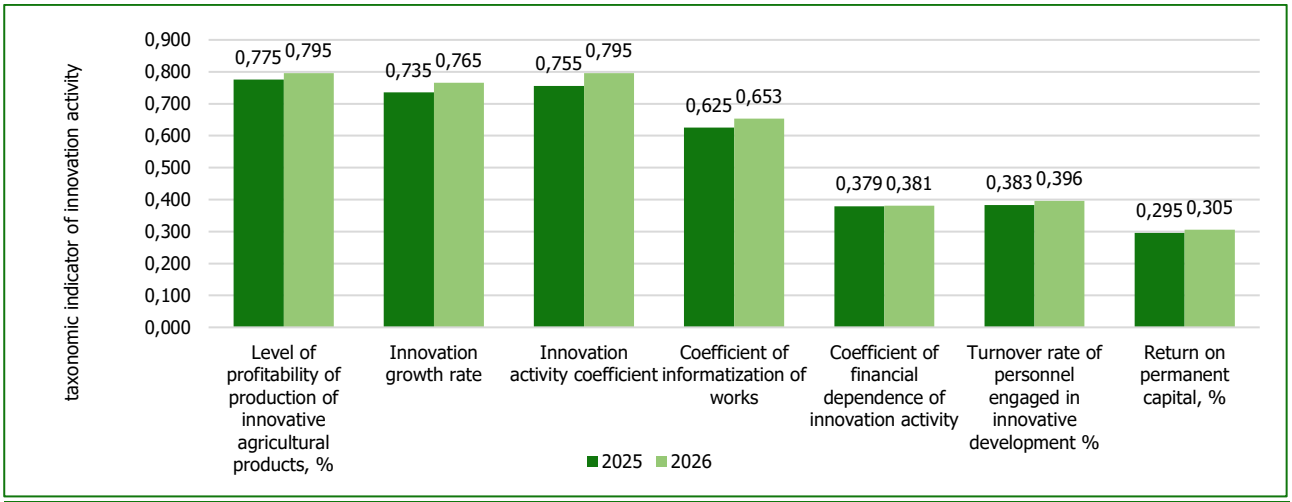

Figure 5. Forecasting the taxonomic indicator of innovation activity of LLC "Rey Agro" of the integrated business structure of the company "Agroprosperis", 2025-2026. *(Source: forecast calculated by the authors taking into account the financial statements of enterprises https://clarity-project.info/)*

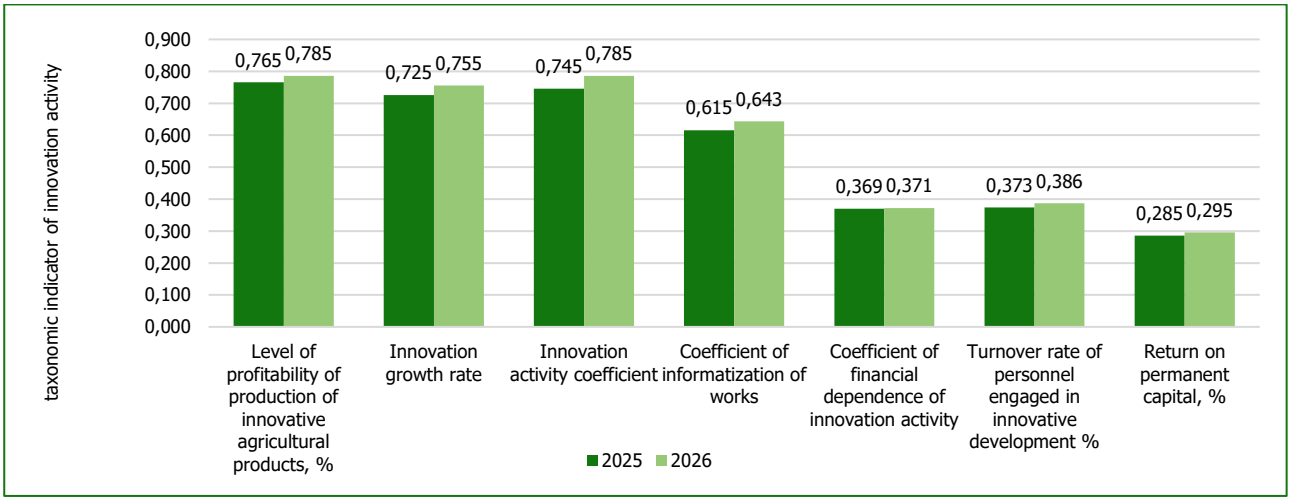

Figure 6. Forecasting the taxonomic indicator of innovative activity of LLC "Latagro" of the integrated business structure of the company "Agroprosperis", 2025-2026. *(Source: forecast calculated by the authors taking into account the financial statements of enterprises https://clarity-project.info/)*

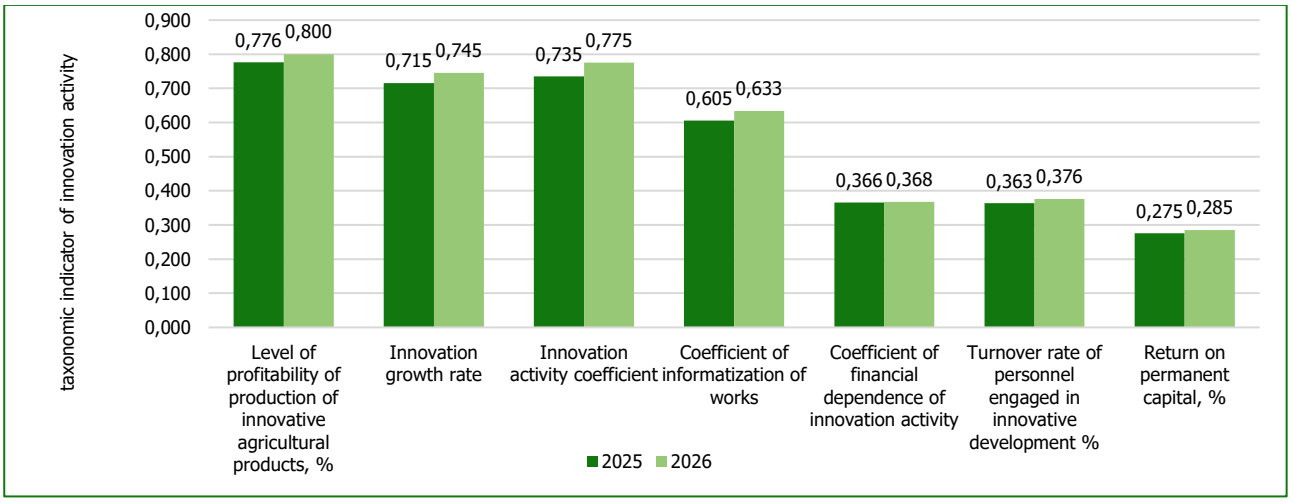

Figure 7. Forecasting the taxonomic indicator of innovation activity of LLC "New Agro Management" of the integrated business structure of the company "Agroprosperis", 2025-2026. *(Source: forecast calculated by the authors taking into account the financial statements of enterprises https://clarity-project.info/)*

Also, for comparative analytical characteristics, a summary of actual and forecast data on innovation activity and the taxonomic indicator of the innovation management system of integrated business structures is proposed for analysts, economists and scientists for a visual comparison of these indicators.

Analysis of the taxonomic indicator, which reflects the forecast of the taxonomic indicator of innovation activity of agricultural integrated business structures for 2025–2026, allows us to assess the dynamics of the main coefficients of efficiency, innovation and financial stability.

For LLC "Golden Dawn (agro)", it is clear that the enterprise demonstrates stable growth in almost all indicators. The level of profitability of innovative products increases from 0.785 in 2025 to 0.805 in 2026, which indicates an improvement in the efficiency of the production of innovative products. The innovation growth coefficient also increases steadily, reaching 0.775 in 2026. This indicates a high growth rate of innovative activity. The profitability of permanent capital increases to 0.316, which demonstrates the effectiveness of long-term investment.

For LLC "Rei Agro", it is clear that the enterprise shows a gradual increase in indicators, although its results are less pronounced. The level of profitability of innovative products increased from 0.775 in 2025 to 0.795 in 2026, which indicates stable development. The coefficient of financial dependence of innovative activities remains practically stable (from 0.379 to 0.381), which indicates an unchanged financing structure. The turnover coefficient increased to 0.396 in 2026, which may indicate difficulties in retaining specialists.

The enterprise LLC "Latagro" demonstrates moderate growth rates with an emphasis on stability. The level of profitability of innovative products increases from 0.765 in 2025 to 0.785 in 2026, which indicates an improvement in productivity. The coefficient of innovative activity increased to 0.785 in 2026, which demonstrates an increase in the intensity of innovative activity. The profitability of permanent capital reaches 0.295 in 2026, remaining at the lowest level among all enterprises.

The enterprise LLC "New Agro Management" demonstrates the least dynamics among the indicators, but stable growth. The level of profitability of innovative products increased from 0.776 in 2025 to 0.800 in 2026. The coefficient of informatisation of work increased to 0.633 in 2026, which indicates progress in the implementation of technologies. The staff turnover rate remains relatively low (0.376), which indicates a stable personnel situation.

Thus, all enterprises demonstrate an increase in innovation indicators, but the leader is LLC "Golden Dawn (agro)", which has the highest profitability and innovative growth indicators. LLC "Latagro" shows stable, innovative activity but has a low return on capital. LLC "New Agro Management" is distinguished by a stable personnel policy, but its innovative indicators remain the lowest. LLC "Rei Agro" has average results with moderate growth, but its low level of financial dependence may limit scaling. The projected indicators indicate a general improvement in the innovative potential of all enterprises, but for full development, some of them require increased investments in innovation and personnel policy.

DISCUSSION

The research of scientists (Porfirenko et al., 2023) is aimed at optimising the mobility of passenger transportation in megacities but does not sufficiently consider the integration of transport innovations into business structures, as well as the impact of such initiatives on the financial mechanisms of regional recovery. Scientists (Mihus et al., 2024) focused on forecasting current assets to prevent bankruptcies but did not consider how these forecasts can be integrated into a broader mechanism of financial recovery or support for innovative business structures. Scientists (Khodakivska et al., 2022) conducted a modelling of the economic security management of innovative entrepreneurship, limited to general theoretical approaches, without taking into account the practical challenges associated with recovery after military conflicts. Scholars (Koshova et al., 2024) focus on financing space activities in wartime, which is important, but do not consider the mechanisms of interaction of this sector with other business structures or their role in the financial recovery of regions. Scholar (Bolton, 2024) carried out an analysis of risks in electricity market reforms is useful but does not consider the specific conditions of the post-war context or the possibilities of integrating these approaches into financial mechanisms for supporting business structures. Scholars (Maconachie et al., 2012) conducted an assessment of urban farming in Sierra Leone focusing on food security but did not highlight the mechanisms for integrating business structures into the financial environment of post-war recovery. Scholars (Chen et al., 2024) analysed the policies of the Chinese automobile industry, but their conclusions do not take into account the specifics of the business environment during the post-war economic restructuring.

DOI: 10.55643/fcaptp.6.59.2024.4663

CONCLUSIONS

Thus, the article analyses the implementation of innovation management in agricultural enterprises in the processes of post-war economic recovery. The financial and economic indicators of the efficiency of innovative agricultural companies of the integrated group "Agroprosperis" for the period 2019–2023 were studied, and the main indicators of the efficiency of innovative agricultural enterprises for 2025–2026 were forecasted. The above allowed us to identify key factors that affect the innovative activity of enterprises and their financial stability and assess the role of personnel policy in the implementation of innovative projects at agricultural enterprises. Based on the calculations, recommendations were made to improve innovative management to increase the efficiency of investments in the agricultural industry in the conditions of post-war recovery.

The results of the analysis are extremely important for understanding the role of innovation management in integrated business structures in the context of the financial mechanism of post-war recovery. They demonstrate the effectiveness of innovation management, the level of their integration into the strategic goals of enterprises and the impact on the general economic condition of agricultural structures. Indicators such as the profitability of innovative products, innovative growth, and informatisation of work and activity reflect the dynamics of the ability of enterprises to adapt to new challenges arising in the post-crisis period. The high level of these indicators in leading companies, such as Golden Dawn (agro) LLC, indicates their ability to effectively use resources, implement new technologies and attract financing for development, which ensures business sustainability and creates the prerequisites for economic growth in the region. The results also highlight the impact of personnel policy on innovative development. For example, the turnover rate reflects the stability of labour resources, which are key to the implementation of innovative projects. Enterprises with stable personnel, such as New Agro Management LLC, can more effectively implement innovative solutions. The level of financial dependence indicates the ability of companies to attract external financing for innovative projects. The growth of this indicator indicates the expansion of access to credit and investment resources, which is critically important in the recovery period. The informatisation of work reflects progress in the implementation of digital technologies that contribute to increasing management efficiency and reducing costs.

The results obtained in the article are also of strategic importance for the formation of a financial mechanism for post-war recovery. They demonstrate which areas of development are most effective for integrated business structures, and suggest which aspects should be strengthened, for example, increasing investment in innovation, developing digital technologies, or improving personnel policy. Thus, the results of the study are key to creating an adapted financial mechanism that will support innovative development and contribute to economic stability and growth of enterprises in the conditions of post-war recovery.

Prospects for research into innovative management of integrated business structures in the financial mechanism of post-war recovery cover several key areas that are of strategic importance for economic development. One of the main areas is the further analysis of the impact of innovative approaches on the financial sustainability of enterprises, which includes the development of models for the optimal distribution of financial resources between innovative projects and traditional activities, as well as the study of opportunities for reducing financial risks through the integration of modern technologies. Another promising area is the improvement of personnel policy. Research should focus on ways to retain highly qualified personnel, develop competencies in the field of innovation, and create motivational mechanisms for attracting young specialists, which will reduce staff turnover and improve the quality of implementation of innovative projects. An important aspect is the study of digitalisation and automation of business processes in the context of innovation management. Prospects include the analysis of the impact of digital technologies on the efficiency of enterprise management, the development of work informatisation, and the introduction of artificial intelligence to forecast economic indicators. The significant potential is provided by research aimed at integrating enterprises into international innovation networks, which will open up opportunities for exchanging experience, attracting foreign investment and entering new markets, which is critically important during the period of economic recovery after the crisis.

ADDITIONAL INFORMATION

AUTHOR CONTRIBUTIONS

All authors have contributed equally.

FUNDING

The Authors received no funding for this research.

CONFLICT OF INTEREST

The Authors declare that there is no conflict of interest.

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ІННОВАЦІЙНИЙ МЕНЕДЖМЕНТ ІНТЕГРОВАНИХ ПІДПРИЄМНИЦЬКИХ СТРУКТУР У ФІНАНСОВОМУ МЕХАНІЗМІ ПОВОЄННОГО ВІДНОВЛЕННЯ

Стаття присвячена дослідженню інноваційного менеджменту інтегрованих підприємницьких структур у контексті фінансового механізму повоєнного відновлення. Акцентовано увагу на важливості впровадження інновацій в аграрні підприємства та на можливості їхнього розвитку в умовах відновлення після війни. Проведено аналіз і прогнозування основних показників ефективності інноваційної діяльності чотирьох аграрних компаній, що входять до складу інтегрованої групи «Агропросперіс». Вивчено динаміку рентабельності, коефіцієнтів інноваційного зростання, активності та інформатизації робіт, а також фінансової залежності й кадрової політики підприємств за період 2019–2023 років із прогнозами на 2025–2026 роки. Визначено, що основним драйвером розвитку є інвестиції в інноваційно-проєктну діяльність, що особливо чітко проявляється в компанії ТОВ «Золотий світанок (агро)», яка демонструє лідерство в цьому напрямі. Прогнози показали позитивну динаміку зростання інноваційного потенціалу, але водночас виявили суттєві відмінності між підприємствами за рівнем інноваційної активності, фінансовою стійкістю та кадровою політикою. Запропоновано рекомендації щодо вдосконалення системи інноваційного менеджменту для підвищення ефективності інвестицій в інновації в контексті забезпечення стабільного кадрового складу та поліпшення фінансової стійкості підприємств у майбутньому. Результати дослідження підкреслюють необхідність посилення інноваційного менеджменту для забезпечення стійкого розвитку аграрних підприємств в умовах відновлення економіки після війни.

Ключові слова: менеджмент, інновації, повоєнне відновлення, фінанси, інтегровані структури

JEL Класифікація: B26, M11, O31

DOI: 10.55643/fcaptp.6.59.2024.4663