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Marta Barna

D.Sc. in Economics, First Vice-Rector,
 Professor of the Department of
 Tourism and Hotel and Restaurant
 Business, Lviv University of Trade and
 Economics, Lviv, Ukraine;
 ORCID: [0000-0001-5248-9774](https://orcid.org/0000-0001-5248-9774)

Roman Myniv

Candidate of Economic Sciences,
 Associate Professor, Department of
 Management and Business
 Administration, Stepan Gzhytskyi
 National University of Veterinary
 Medicine and Biotechnologies, Lviv,
 Ukraine;
 ORCID: [0000-0002-7673-0283](https://orcid.org/0000-0002-7673-0283)

Olena Vynogradova

D.Sc. in Economics, Professor, Head of
 the Marketing Department, State
 University of Information and
 Communication Technologies, Kyiv,
 Ukraine;
 ORCID: [0000-0002-7250-5089](https://orcid.org/0000-0002-7250-5089)

Oleksiy Cherkaskyy

PhD Student of the Marketing
 Department, Simon Kuznets Kharkiv
 National University of Economics,
 Kharkiv, Ukraine;
 ORCID: [0009-0004-9537-284X](https://orcid.org/0009-0004-9537-284X)

Svitlana Bondarenko

D.Sc. in Economics, Associate
 Professor of the Department of
 Management, Kyiv National University
 of Technologies and Design, Kyiv,
 Ukraine;
 ORCID: [0000-0001-7183-1395](https://orcid.org/0000-0001-7183-1395)

Iryna Melnyk

D.Sc. in Economics, Professor, Head of
 the Department of Tourism and Hotel
 and Restaurant Business, Lviv
 University of Trade and Economics,
 Lviv, Ukraine;
 ORCID: [0000-0002-3132-6500](https://orcid.org/0000-0002-3132-6500)
 (Corresponding author)

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FINANCING INVESTMENT PROJECTS ON SECURITY INNOVATIONS IN THE MARKETING MANAGEMENT SYSTEM OF TOURISM CLUSTER BUSINESS STRUCTURES

ABSTRACT

The article is devoted to the study of financing investment projects aimed at implementing security innovations in the marketing management system of tourism cluster business structures. The paper substantiates how financial decisions, the volume of capital investments, and innovative security technologies affect the effectiveness of marketing strategies, communication tools, and management mechanisms of tourism clusters. A comprehensive statistical, economic, and mathematical analysis was conducted for 2020–2024, which made it possible to establish the relationship between investment activity, profitability, and the effectiveness of marketing management of cluster entities. It is shown that the integration of financial resources with marketing tools – digital channels of interaction, cluster cooperation, differentiation of the tourism product, and security systems – forms a stable competitive position of enterprises. The developed forecasting models demonstrate that investing in security innovations not only increases financial performance but also optimizes marketing management processes, strengthens cluster interaction, and increases the adaptability of tourism business structures to the challenges of the external environment. The practical value of the study lies in the development of recommendations for integrating security innovations into the marketing management system of tourism clusters, taking into account regional characteristics, investment attractiveness, and strategic priorities of sustainable development.

Keywords: tourism clusters, investments, profitability, innovations, marketing, security, modeling, management, forecasting

JEL Classification: C38, D22, L83, M31, O32, R11

INTRODUCTION

The modern development of the tourism industry of Ukraine takes place in conditions of a high level of uncertainty, which requires rethinking approaches to managing marketing processes and investment activities in cluster business structures. In recent years, scientific research has paid significant attention to the study of cluster development of tourism, digitalization, innovations, ensuring the safety of tourist services, as well as financial and economic mechanisms for increasing the efficiency of tourist enterprises.

At the same time, the issues of integrating security innovations into the marketing management system of tourist clusters remain insufficiently explored. Existing research is dominated by works aimed at assessing investment activity or individual aspects of marketing, but comprehensive models that combine financial instruments, security technologies, and marketing management in a cluster environment are practically absent in the scientific literature. It has also not been sufficiently studied how financing security innovations transforms the marketing strategies of tourist enterprises, affects their profitability, forms the competitive advantages of clusters, and ensures the sustainability of tourist systems.

In the context of growing security threats, changing consumer priorities, and increased demands for service quality, it is the combination of marketing management and financing of security innovations that becomes a key factor in the sustainable development of

tourism clusters. However, scientific sources lack generalized tools for assessing the effectiveness of such a combination, as well as models for predicting the impact of investments on the marketing results of cluster structures.

Thus, the unresolved issues that led to the choice of the topic of this article are:

- insufficient development of theoretical and methodological principles for integrating security innovations into the marketing management system of tourism clusters;
- lack of economic and mathematical models that reflect the relationship between investment activity, marketing tools, and the profitability of cluster entities;
- the need to clarify mechanisms for financing innovations that increase the level of security, competitiveness, and marketing efficiency of tourism enterprises.

In this context, the study is aimed at theoretical and methodological substantiation and economic and mathematical modeling of the impact of investments in security innovations on the marketing management system of tourism cluster business structures, which ensures the scientific novelty and practical significance of the results obtained.

LITERATURE REVIEW

The analysis of sources showed that effective financing of tourism clusters is possible only through the integration of innovations, digital technologies, and security strategies. Modern scientists emphasize the need to combine cluster management with analytical forecasting models, which ensures increased profitability and sustainability of the tourism industry of Ukraine.

The first group of authors emphasizes the theoretical and methodological foundations of clustering and competitiveness. Jackson J. (2006) considers the potential for the development of regional tourism in China through the activation of business clusters in a socialist market economy. The author emphasizes the role of the cluster approach in stimulating innovation and increasing the competitiveness of the industry. Iordache C., Ciochină I., & Asandei M. (2010) prove that the formation of tourism clusters contributes to the growth of the efficiency of enterprises and the development of a competitive environment. The work emphasizes the importance of inter-firm cooperation for increasing tourist attractiveness.

Vavdiuk N. et al. (2021) focus on the management of current assets of enterprises, emphasizing the importance of a rational capital structure and optimization of financial flows to ensure liquidity and sustainability of the business. Novelli M., Schmitz B., & Spencer T. (2006) analyze the British experience in the formation of tourism networks and clusters, emphasizing their role as institutional forms of innovative development. Ferreira J. M., & Estevão C. M. (2009) propose a conceptual model of regional competitiveness of tourism clusters, emphasizing the relationship between economic synergy, innovation, and spatial advantages.

The second group of authors analyzes innovation, sustainable development, and security in tourism. The article by Dwyer, L., Edwards, D., Mistilis, N., Roman, C., & Scott, N. (2009) presents a comprehensive vision of managing tourist destinations and enterprises in the context of global transformations. The authors identify the key drivers of change in the industry: economic, social, technological, demographic, and environmental, and develop a strategic model for adapting tourism systems to the challenges of the future. Plakhotnik O. et al. (2024) investigate the formation of effective management systems in higher education, focusing on innovation, adaptability, and systematic management. Their conclusions are consistent with the topic of the article, as they emphasize the importance of organizational flexibility and strategic management for ensuring the sustainability and efficiency of economic systems, particularly in the production and financial spheres. The study by Weidenfeld, A. (2013) examines the role of cross-border regional innovation systems in tourism development. The author analyzes the mechanisms for the exchange of knowledge, technologies, and management practices between border regions, which contribute to the creation of joint tourism products and increase the competitiveness of destinations. Hallenga-Brink S., & Brezet J. C. (2005) present a model of sustainable innovative design for small tourism enterprises, which allows integrating environmental standards into business models.

The third group of researchers, Tverezovska N. et al. (2022), investigates the management of the educational process using information technologies aimed at improving the quality of training of specialists in higher education institutions. The results of this work are relevant to our article, as they confirm the importance of digital transformation and innovative management solutions for increasing the efficiency and adaptability of organizational systems, which is consistent with the financial and economic aspects of enterprise sustainability. In the article, Najda-Janoszka, M., & Kopera, S. (2014) analyzed the barriers to innovative development in the tourism industry of the Southern region of Poland. Authors Pinto, H., Cruz,

A. R., & Combe, C. (2015) proposed a model of cooperation between state, scientific, and private structures, which contributes to the creation of innovative infrastructure and increases the competitiveness of maritime clusters. Hjalager A. M. (1996) investigates the relationship between tourism and the environment, revealing the innovative aspect of sustainable development.

The fourth group of authors conducted empirical research and institutional models. Lutkovska, S. et al. (2025) investigate the financial and economic management of the efficiency of energy crop production in the system of smart technological development of labor resources, which is consonant with the topic of our article. The article by Li, P., Zhou, Y., & Huang, S. (2023) substantiates the crucial role of information technology in the development of e-tourism marketing, where the authors prove that digital platforms, data analytics, and mobile services form a new ecosystem of interaction between tourism enterprises and consumers, increasing the effectiveness of promotion and personalization of tourism services. Flagestad A., & Hope C. A. (2001) substantiate strategies for sustainable value creation in winter tourist destinations, determining the balance between economic and environmental interests. Rowan N. J., & Galanakis C. M. (2020) analyze the challenges and opportunities that have arisen during the COVID-19 pandemic, emphasizing the importance of security innovations and digital transformation in the tourism sector.

The fifth group analyzes digitalization, investments, and the modeling of economic processes. Kubitskyi S. et al. (2024) assess the impact of innovative technologies on global competitiveness, emphasizing the role of investments in digital solutions. Andriushchenko, K. et al. (2019) analyze the impact of cost drivers on value-based management of investment activities of enterprises, emphasizing the role of financial indicators in strategic management. Authors Zhou, L., Buhalis, D., Fan, D. X., Ladkin, A., & Lian, X. (2024) explore the strategies of "smart" tourist destinations aimed at attracting digital nomads, focusing on innovations, digital infrastructure, and competitive advantages that shape a new model of global mobility and sustainable tourism. Kaganzi, E., Ferris, S., Barham, J., Abenakyo, A., Sanginga, P., & Njuki, J. (2009) examine the role of collective action in maintaining linkages to high-value markets in Uganda, highlighting the importance of cooperation and partnership in strengthening the position of small enterprises in global value chains. Kopishynska, O., Utkin, Y., Galych, O., Makhmudov, H., Svitlychna, A., & Lyashenko, V. (2021) substantiate the effectiveness of the case method in the study of information technology and IT project management as a tool for developing students' analytical and practical thinking. Kubitskyi, S., Shchokin, R., Fedoruk, O., Horokhivska, T., & Shorobur, I. (2023) examine modern approaches to the management of higher education institutions, emphasizing their role as an innovative mechanism for improving the quality and competitiveness of the educational environment. Su, C. T., Chen, Y. H., & Sha, D. Y. (2006) examine the relationship between innovative product development and consumer knowledge, using data mining methods to integrate customer data into the decision-making process, which increases the effectiveness of innovation management. Carson, D. A., & Carson, D. B. (2018) analyze the contribution of international lifestyle migrants to the development of rural tourism innovations in northern Sweden, showing how their sociocultural practices stimulate creativity, entrepreneurship, and the revitalization of remote areas. Kovalchuk, S. et al. (2024) explore the role of marketing analytics in value creation within the creative economy, focusing on innovative approaches to enterprise performance management.

The authors Pan, W., Xie, T., Wang, Z., & Ma, L. (2022) prove that the digital economy is a driver of innovative development and growth in total factor productivity, as it contributes to increasing the efficiency of resource use, technological innovation, and integration of intellectual capital into economic processes. Nitsenko, V. et al. (2024) consider the ethical and social factors of the transformation of business models of enterprise management in the context of sustainable development, emphasizing the importance of corporate responsibility and innovation strategies. Dmytryshyn, L., & Blahun, I. (2016) investigate the model of achieving the allocative efficiency of credit resources in the banking system of Ukraine, which is consistent with the topic of the article in terms of optimizing financial flows and increasing the stability of economic structures through rational capital management. Davydenko, N. et al. (2021) assess the components of the financial potential of the regions of Ukraine, which is relevant to our work, through the analysis of spatial differences in financial stability and the role of the institutional environment in the formation of economic security. Verhun, A. et al. (2022) analyze the logistical aspects of the safe development of enterprises in the industrial, agricultural, and tourism sectors during martial law, which is consistent with the focus of our article on the integration of financial stability with logistical solutions in crisis conditions. Blahun, I. S. et al. (2022) consider stock indices as indicators of market efficiency, which is relevant to our topic through the methodology for assessing financial risks and the relationship between market signals and enterprise security. Sitnicki, M. et al. (2024) investigate the development and support of Ukrainian entrepreneurship in the knowledge economy, which is relevant to our research through the focus on innovative management models and digital transformation of economic processes. Vavdiuk, N. et al. (2022) analyze the formation of soft skills in higher education students, which is related to the topic through human capital as a factor of management efficiency and financial sustainability in an inno-

vative economy. Davydenko, N. et al. (2021), in their study of the impact of climate change on the investment attractiveness of agricultural enterprises, emphasize the role of environmental risks, which is consistent with the analysis of external factors of instability and their impact on the financial security of agricultural businesses.

The following group of authors, Salvador, R., Simões, A., & Soares, C. G. (2016) studied the economic characteristics, internal structure, and strategic guidelines for the formation of the Portuguese maritime cluster, which is considered an example of the integration of industrial, transport, and tourism sectors. In the scientific work Muzychenko-Kozlovska, O. V. (2006) presented a methodology for assessing the level of tourist attractiveness of a region, based on a comprehensive analysis of natural, economic, and social factors of tourism development. The textbook Nakonechny, S. I., Tereshchenko, T. O., & Romanyuk, T. P. (2006) systematizes modern econometric methods of analysis necessary for modeling socio-economic processes, in particular in the field of tourism and regional economy. The author Tsyganchuk, R. O. (2013) investigates the modeling of the production process and the relationship of its economic characteristics, which is important for assessing the efficiency of tourism enterprises and regional clusters.

The next group is economic-analytical and official sources that provide official statistical data on the dynamics of the tourism industry of Ukraine, including tax revenues and investment volumes. They also provide generalized macroeconomic indicators necessary for calculating investment efficiency and predicting profitability.

A generalized analysis of scientific sources confirms that the modern development of tourism is based on a combination of a cluster approach, digital technologies, and innovative management. Leading researchers emphasize the importance of intersectoral collaboration, the use of data for strategic planning, and increasing the competitiveness of regions through the integration of business, education, and science.

AIMS AND OBJECTIVES

The purpose of the study is to provide theoretical and methodological justification and economic and mathematical modeling of financing investment projects from security innovations in the marketing management system of tourism cluster business structures, taking into account their impact on the competitiveness, profitability, and strategic development of the tourism industry.

Research objectives:

1. To generalize theoretical approaches to the development of tourism clusters, marketing management, and the implementation of security innovations, identifying their role in shaping the competitive advantages of tourist destinations.
2. To form methodological principles for integrating financing, marketing tools, and security innovations into a single management system for tourism cluster business structures.
3. To analyze the financial and economic indicators of the activities of tourism cluster enterprises for 2020–2024 to determine trends in investment support and marketing effectiveness.
4. To investigate the impact of investments in security innovations on the profitability of tourism enterprises and the effectiveness of marketing strategies within cluster interaction.
5. To develop economic and mathematical models (linear and nonlinear regressions, production functions) that quantitatively describe the relationship between the share of capital investments, marketing parameters, and financial results of enterprises.
6. To form predictive models of changes in investment activity and profitability of tourism clusters, and identify scenarios for their development in 2026.
7. To propose management and marketing recommendations for increasing the efficiency of financing security innovations in tourism clusters, taking into account regional specifics, digital transformation, and the needs of strategic sustainability.

METHODS

The methodological basis of the study involves the use of systemic, economic-mathematical, and statistical approaches that provide a comprehensive reproduction of financial and economic processes in tourism cluster business structures. The

systemic approach allowed us to consider the tourism industry as a complex reproducing system that combines economic, social, organizational, and managerial components. Key structural levels of analysis were identified - macroeconomic (national economy), mesoeconomic (regional clusters), and microeconomic (individual enterprises). At each level, indicators of investment dynamics, income, profit, and profitability were measured, which creates a basis for further modeling.

Statistical methods were used to construct dynamic data series for 2020–2024, calculate relative deviations, growth rates, and average values. This stage involved generalizing the indicators of the number of tourist enterprises, the amount of taxes paid, the amount of capital investments, and the share of investments in the total volume of capital investments. A comparative analysis was conducted on regional samples (Poltava, Khmelnytskyi, and Chernivtsi regions), which made it possible to assess geographical differences in the financing and effectiveness of investment projects.

Economic and mathematical modeling was based on the concept of production functions, which describe the relationship between the amount of resources used and the results obtained. Both linear and nonlinear regression forms were used - power, exponential, logarithmic, hyperbolic, etc. For each model, the correlation coefficients (r) and determination (R^2) were calculated, which characterize the strength and quality of the relationship between the factor and effective features. To check the adequacy of the models, the Fisher criterion was used, which allows assessing the statistical significance of the constructed dependencies at a confidence level of 95%.

The factorial feature in the study was the share of capital investments in the tourism industry in the total volume of investments, and the effective indicator was the profitability of tourism activities. The least squares method was used to determine the parameters of the regression equation, which made it possible to quantitatively assess the impact of investments on the financial results of enterprises. To predict the dynamics of indicators, the construction of a forecast series of the share of investments and the level of profitability for 2026 was used. Comparison of the obtained results made it possible to determine the best models with the highest correlation and determination coefficients, which indicate their adequacy to real data. At the stage of economic analysis, the modeling results were interpreted through the prism of marketing management mechanisms, where investments are considered as a strategic tool for the development of security innovations. This approach allowed combining financial and analytical assessment with management aspects that form the basis for the effective functioning of tourism clusters in the context of sustainable development and integration into the European economic space.

RESULTS

We begin the study of the selected topic by presenting the dynamic series of the number of travel agencies taxpayers over the last five years. As we can see, over the last five years, there has been a decrease in the number of travel agencies in Ukraine by 2520 units or 12.49%, including a rapid decrease in legal entities in the tourism business by 1637 units or 31.36%, and individuals by 883 units or 5.91%. Graphical presentation of the dynamic series of the number of travel agencies taxpayers over the last five years in Figure 1.

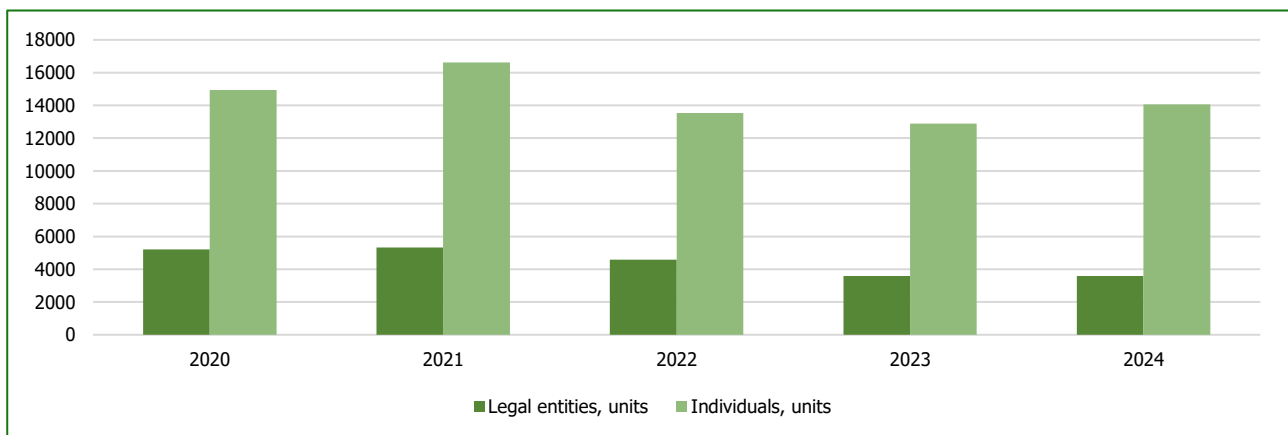


Figure 1. Dynamics of the number of taxpayer travel agencies, 2020–2024. (Source: summarized by the authors using official statistical data)

This trend requires a comprehensive interpretation from the perspective of marketing management and the functioning of tourism clusters.

Firstly, a significant factor in the reduction is military actions, which led to the reformatting of tourist flows, the temporary cessation of the activities of some enterprises, the loss of material resources, and a change in the geography of demand. In such conditions, small companies that are not part of cluster associations and do not have diversified marketing channels turned out to be less resilient. This emphasizes the role of cluster support and joint marketing as survival tools.

Secondly, the decrease in the number of entities is explained by the increased requirements for security, both physical and digital. Many micro-enterprises were unable to ensure the implementation of the necessary innovations: tourist verification systems, digital reservation platforms, and online communication tools adapted to international security standards. While cluster structures, on the contrary, were able to accumulate resources for such innovations through joint financing.

Thirdly, the reduction in the number of legal entities signals market consolidation and transformation of business models: some companies have switched to simplified forms of activity or have integrated into larger business structures. This reflects the trend towards cost optimization, revision of marketing strategies, and transition to digital sales channels.

From the point of view of marketing management, such dynamics are an indicator that tourism enterprises that have not adapted their marketing strategies to the conditions of high turbulence have lost their competitive positions. Companies that have actively used investments in security innovations - digital services, customer protection systems, automated booking systems – have demonstrated higher resilience and maintained their market presence.

Thus, the reduction in the number of tourism enterprises is a consequence of the action of external (military risks, falling demand, migration processes) and internal factors (insufficient investment, weak clustering, outdated marketing tools). From the perspective of a cluster approach, the most resilient were those entities that were integrated into joint marketing programs, had access to shared resources, and implemented security innovations into services and infrastructure.

Next, we will form a dynamic series of taxes paid to the state budget from the tourism sector over the past five years. Despite the decrease in the number of travel agencies that are taxpayers over the past five years, the state budget from the tourism sector received UAH 1,631.72 million in 2024, or 24.91% more than in 2020, which can be explained by the increase in prices for tourism services. An illustration of the dynamic series of taxes paid to the state budget from the tourism sector over the past five years is presented in Figure 2.

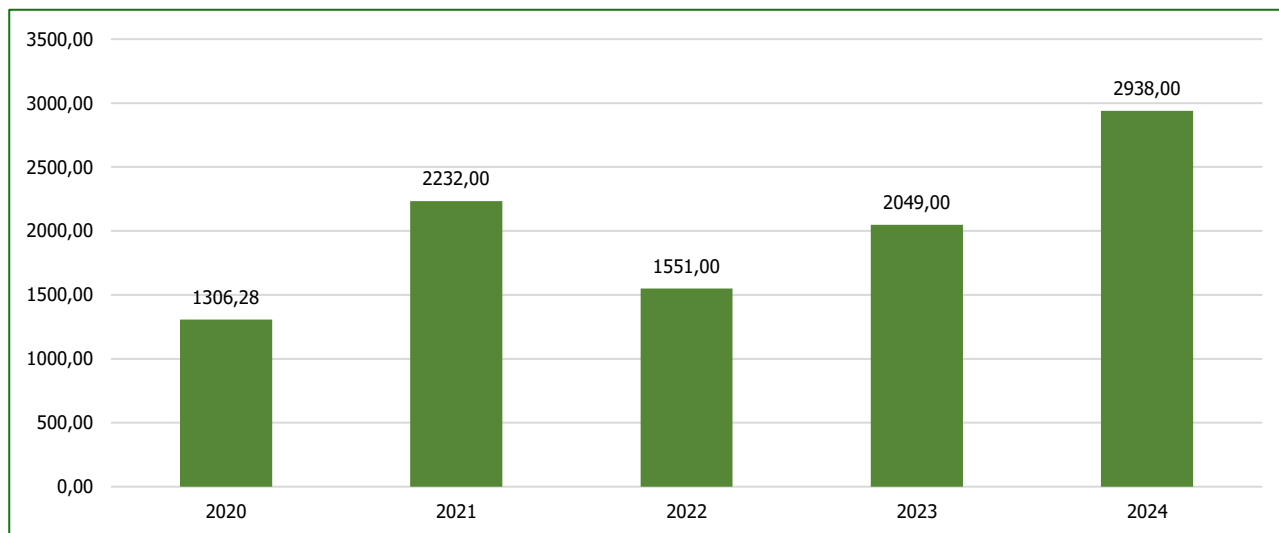


Figure 2. Dynamics of taxes paid to the state budget from the tourism sector, 2020-2024. (Source: summarized by the authors using official statistical data)

Using the data from the Statistical Yearbook of Ukraine, we constructed an expanded dynamic series that encompasses the total volume of capital investments in the national economy, the amount of capital invested specifically in the tourism sector, and their proportion within the overall structure of capital expenditures over recent years. The analysis revealed a stable upward trend in capital investment both at the macroeconomic level and within the tourism industry, indicating the gradual strengthening of tourism as an investment-attractive and strategically significant sector. At the same time, the share of capital investments directed into tourism increased to 0.16%, rising by 0.06 percentage points, which confirms the growing role of the tourism industry in shaping national investment dynamics and highlights its increasing strategic importance for regional development. The graphical representation of the time series of total capital investments and

tourism-related capital expenditures, presented in Figure 3, provides a clear visualization of structural shifts, the intensity of investment inflows, and the deepening institutional interest in the development of tourism cluster business structures.

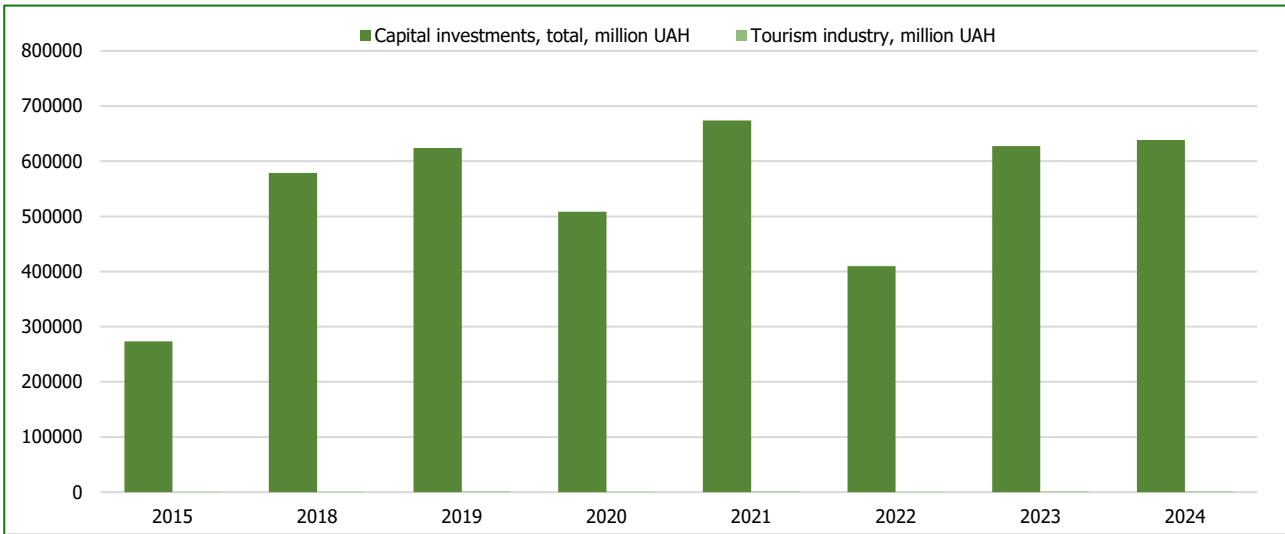


Figure 3. Dynamic series of general capital investments and capital investments in the tourism industry, 2015-2024. (Source: summarized by the authors using official statistical data)

Next, we will present the volume of capital investments in the regions, and tourism business entities will be studied, modeled, and forecasted in further research. We observe that the largest amount of capital investments in the tourism industry came to the Khmelnytskyi region, although its share in general capital investments has decreased by 0.35 pp in the recent period. The growth of capital investments in the tourism industry is explained by the historical and recreational potential of the region. A visual representation of the distribution and dynamics of capital investments directed into the tourism industry across the regions of Ukraine over the examined period is provided in Figure 4, which allows for a clearer understanding of regional disparities, investment concentration patterns, and the varying intensity of financial support for tourism-related development initiatives.

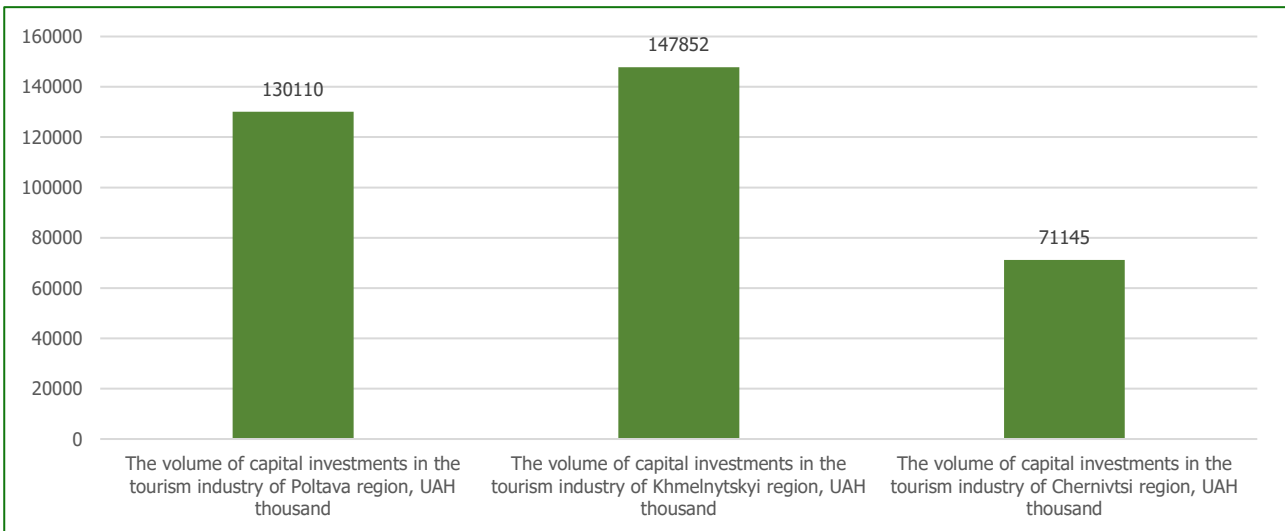


Figure 4. Volume of capital investments in the tourism industry of the regions of Ukraine, 2015-2024. (Source: summarized by the authors using official statistical data)

We outline further study of financing investment projects on security innovations in the marketing management system of tourism cluster business structures. Tourism clusters in Ukraine include: public organization "Kamynetskyi divokray", eco-agritourism cluster "Oberig", tourism cluster "Southern Tourist Ring", tourism and recreation cluster "Gogolivskie sites of Poltava region", Podolsk-Bukovyna tourism cluster, cluster "Slavutych", as well as agrotourism cluster "GorboGory". Muzychenko-Kozlovska O.V. investigated and conducted a conditional distribution of the country's regions according to the criterion of the tourist attractiveness index (Table 1).

Table 1. Distribution of the country's regions according to the criterion of the tourist attractiveness index according to the Muzychenko-Kozlovskaya method.

Level of tourist attractiveness of regions	The value of the integral exponent	Regions of the country
Highest	2.18–1.68	Kyiv, Lviv region
High	1.67–1.24	Khmelnyskyi, Vinnytsia, Odesa, Mykolaiv, Kyiv, Kharkiv, Zakarpattia regions
Average	1.23–1.05	Poltava, Volyn, Rivne, Chernivtsi, Kirovohrad, Chernihiv, Ivano-Frankivsk regions
Low	1.04–0.47	Ternopil, Sumy, Cherkasy, Zhytomyr, Dnipropetrovsk regions

Taking into account the conditional distribution of Ukrainian regions by the tourist attractiveness index, it becomes possible to identify the relevant tourism entities and justify their inclusion in specific cluster formations for the purposes of further analytical investigation. Such differentiation provides a structured basis for comparing the performance of cluster participants operating under varying levels of regional attractiveness and investment potential. The analysis of key financial indicators shows that, despite structural and functional differences among tourism enterprises and institutions within the clusters, their net income from the sale of products and services, as well as net profit, has demonstrated a stable upward trend over the past five years. This indicates not only the resilience of these entities but also the intensification of their financial and economic activity under changing market and institutional conditions. The dynamics of net income and net profit of the analyzed cluster business structures over the five-year period are visually presented in Figure 5, which allows for a clearer interpretation of growth patterns and performance trajectories.

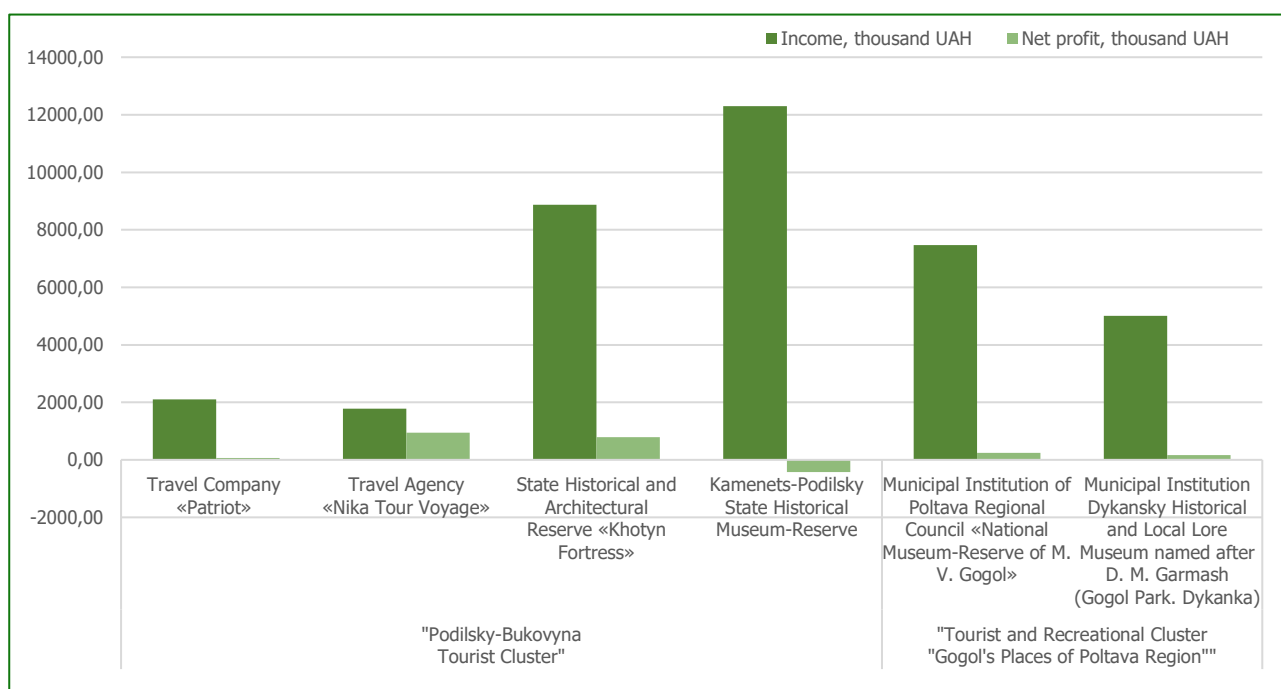


Figure 5. Net income from sales of products (goods, works, services) and net profit of cluster business entities in the tourism industry, 2020-2024. (Source: calculated by the authors using official statistical data)

Next, we will present and calculate the main coefficients and indicators of the activity of cluster business entities in the tourism industry over the past five years. These coefficients are used to analyze and assess the effectiveness of the tourism business at various levels. An illustration of the results of the activities of cluster business entities in the tourism industry - the profitability of tourism activities over the past 2024 is presented in Figure 6.

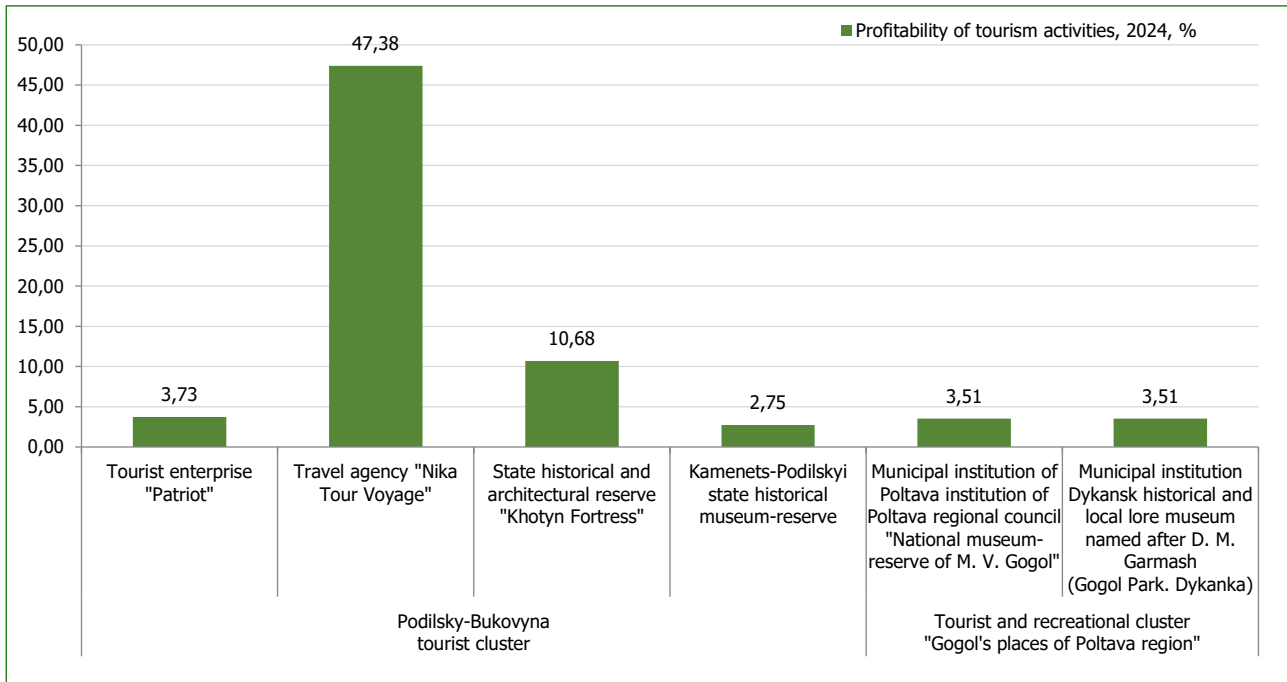


Figure 6. Profitability of tourism activities of cluster business entities in the tourism industry, 2024. (Source: calculated by the authors using official statistical data)

As we can see, the high level of profitability of tourism activities in 2024 in the travel agency "Nika Tour Voyage", but its indicator in 2024 is lower than the similar indicator in 2020 by 19.49 pp. The lowest indicator of profitability of tourism activities in the Kamianets-Podilskiy State Historical Museum-Reserve in 2024 is 2.75%, but this is a positive result of activity, because in 2020-2022 the museum-reserve was unprofitable.

The obtained statistical indicators of the activity of tourism clusters were analyzed using economic and mathematical methods and regression modeling. The production function in this context acts as a mathematical model that reflects the relationship between the volume of investments in the tourism industry and the level of its profitability. To build the model, linear and nonlinear regression functions calculated using the least squares method were used. Analysis of the correlation coefficients, determination, and Fisher's criterion confirmed the adequacy of the constructed models and the reliability of their results. This made it possible to determine the most accurate regression dependence that reflects the impact of the share of capital investments on the profitability of tourism activities and can be used for further forecasting industry efficiency (Table 2).

Table 2. Forecasting the factorial feature of the share of capital investments in the tourism industry in total capital investments of cluster entities of the tourism industry, 2026.

Clustering	Tourist entities	Share of capital investments in the tourism industry in total capital investments, %	Growth, +, -
Podilsky-Bukovyna tourist cluster	Travel company "Patriot"	1.80	0.08
	Travel agency "Nika Tour Voyage"	1.80	0.08
	State historical and architectural reserve "Khotyn Fortress"	2.65	0.09
	Kamenets-Podilskiy state historical museum-reserve	1.80	0.08
Tourist and recreational cluster "Gogol's places of Poltava region"	Municipal institution of Poltava, institution of Poltava regional council "National museum-reserve of M. V. Gogol"	0.86	0.05
	Municipal institution Dykansky historical and local lore museum named after D. M. Garmash (Gogol Park. Dykanka)	0.86	0.05

As a result of using the built-in statistical function, the growth of the share of capital investments in the tourism industry in total capital investments in the forecast year 2026 was calculated and proposed. The growth percentage is insignificant, but possible for further innovative development, marketing management, and overall effective operation of tourism cluster business structures. The graphically calculated and proposed forecast factor of the share of capital investments in the tourism industry in total capital investments of cluster business entities in the tourism industry is presented in Figure 7.

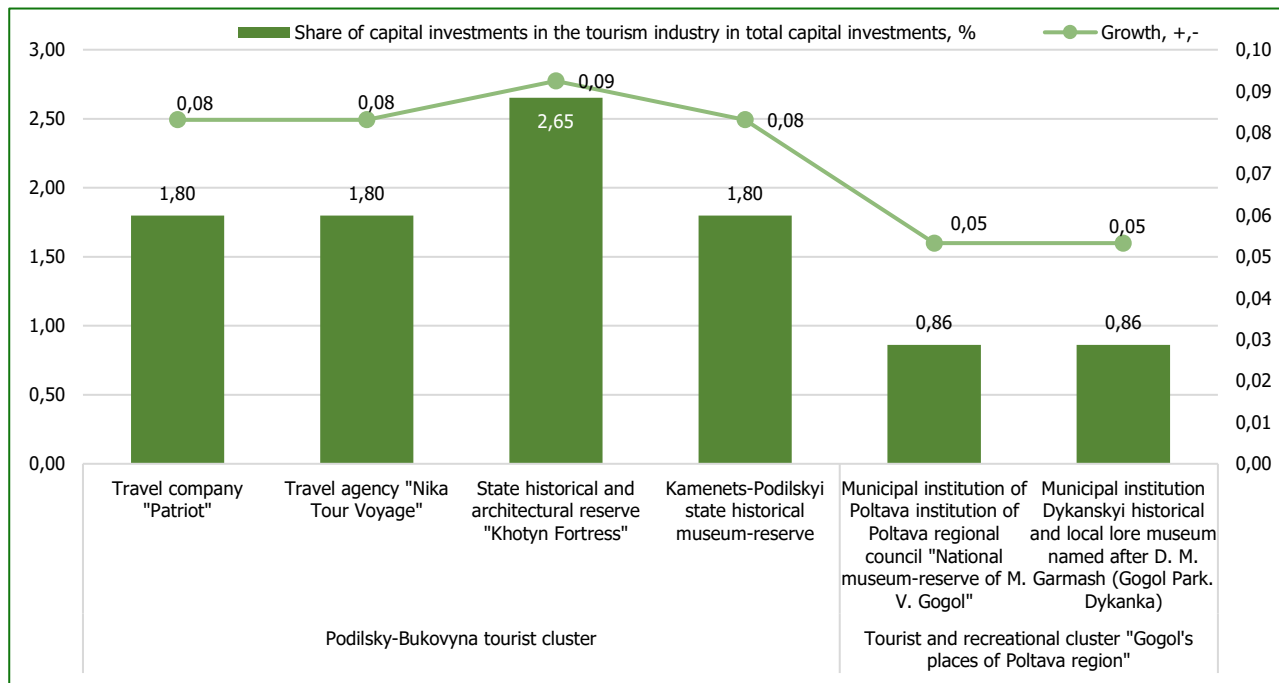


Figure 7. Forecasting the factorial feature of the share of capital investments in the tourism industry in total capital investments of cluster business entities in the tourism industry, 2026.

The next step is to select the best production regressions of the profitability of tourism activities of cluster business entities in the tourism industry. Production functions are selected according to the highest correlation coefficient, determination coefficient, and F-Fisher criterion (Table 3).

Table 3. Results of production regressions of the profitability of tourism activities of cluster business entities in the tourism industry, 2026.

Clustering	Tourist entities	Production function of the profitability of tourism activities	Forecast value of profitability of tourism activities, %, 2026	Growth (decrease), +, -, 2026 to 2024	Coefficient of determination R ²	Correlation coefficient r	The estimated value of Fisher's F test, F _{diff}
Podilsky-Bukovyna tourist cluster	Travel company "Patriot"	$Y=0.69e^x+4.14$	8.28	4.55	0.97	0.98	1.80
	Travel agency "Nika Tour Voyage"	$Y=-28.70/X+68.31$	49.69	2.30	1.00	0.89	3.56
	State historical and architectural reserve "Khotyn Fortress"	$Y=0.46X+10.97$	12.19	1.51	0.95	0.87	1.07
	Kamenets-Podilskiy state historical museum-reserve	$Y=9.58^x-3.95$	3.28	0.53	0.92	0.96	33.43
Tourist and recreational cluster "Gogol's places of Poltava region"	Municipal institution of Poltava, institution of Poltava regional council "National museum-reserve of M. V. Gogol"	$Y=0.40/X^2+3.95$	4.49	0.97	0.77	0.68	1.63
	Municipal institution Dykanskyi historical and local lore museum named after D. M. Garmash (Gogol Park. Dykanka)	$Y=0.69/LnX+3.95$	4.74	1.23	0.78	0.72	0.95

We observe qualitative results of selected production regressions of the profitability of tourism activities of cluster business entities of the tourism industry, an increase in the effective indicator in 2026, which will allow, as previously noted, enterprises and institutions of this sphere to develop. Graphically, the forecast value of the profitability of tourism activities, taking into account capital investments, as the main element of financing investment projects on security innovations in the marketing management system of tourism cluster business structures, 2026, using linear and nonlinear functions, is presented in Figure 8.

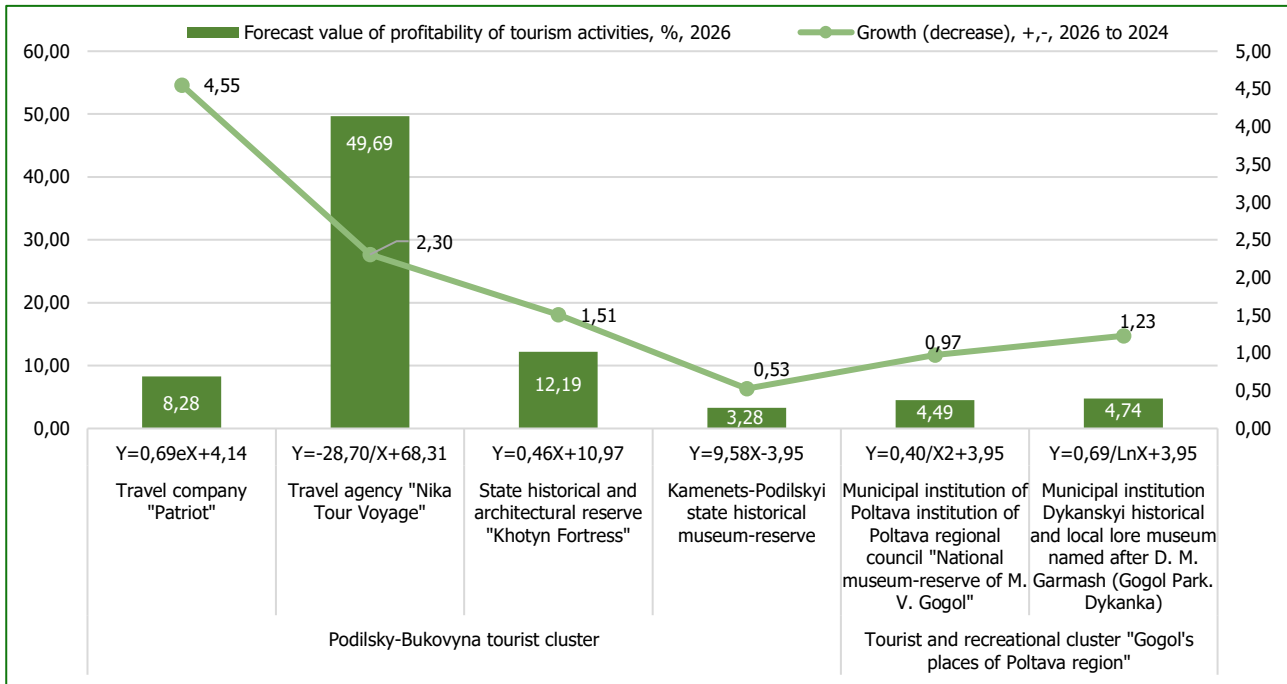


Figure 8. Forecast value of profitability of tourism activity taking into account capital investments as the main element of financing investment projects on security innovations in the marketing management system of tourism cluster business structures, 2026, using linear and nonlinear functions.

The obtained results of the study indicate a stable and statistically confirmed relationship between the volume of financing of investment projects in the tourism industry, the level of implementation of security innovations, and changes in the profitability of cluster entities. It was established that a gradual increase in the share of capital investments – especially aimed at the modernization of security infrastructure, digitalization of services, improvement of logistics, and protection of tourist routes – provides a positive dynamic of effective indicators: net profit grows, profitability ratios improve, resource turnover increases, and operational risks decrease. This means that investments perform not only the function of updating the material and technical base, but also become a strategic tool of marketing management, forming a new quality of competitive advantages of tourist clusters.

The constructed production regressions and forecasting models confirmed that it is security innovations that are the most effective in terms of return on investment: the introduction of electronic systems for controlling tourist flows, protective infrastructure, digital booking services and intelligent customer data management systems provide a tangible multiplier effect, combining an increase in financial results with increased consumer confidence, brand equity and a positive tourist image of the regions. Forecast values for 2026 demonstrate that even a slight increase in investment activity (0.05–0.09 as a share of investments) can provide a significant improvement in profitability – from 0.53 to 4.55 percentage points, depending on the enterprise. This indicates a high sensitivity of financial results to investments in security and marketing efficiency. The results of the analysis also proved that it is the cluster form of organizing tourism activities that is most favorable for attracting investments and their effective use. The coordination of interests of enterprises, authorities, cultural institutions, and recreational facilities within clusters provides a synergistic effect: the integration of the tourism product increases, logistics and marketing communications improve, information transparency increases, and innovations scale faster and cheaper. Security solutions implemented in one enterprise can be adapted by other cluster participants, which reduces costs and forms uniform standards of service quality.

DISCUSSION

Unlike previous scientific studies, which focused mainly on general mechanisms of clustering or innovative development of tourist areas (Dwyer et al., 2009; Weidenfeld, 2013), the results of our work complement the scientific discussion by using specific economic and mathematical models built on the basis of real statistical data of tourist clusters in Ukraine. The article proposes not an abstract theoretical model, but a formalized regression system that describes the relationship between the share of capital investments in the tourism industry and indicators of the profitability of enterprises. The constructed linear and nonlinear production functions, determined using the least squares method, serve as an analytical model that allows us to quantitatively assess the effectiveness of financing security innovations and predict their impact on future financial results. Unlike the works of Li et al. (2023) or Hjalager (1996), where innovations are considered mainly conceptually, our study combines financial and economic analysis with empirical modeling, which allows us to determine the actual elasticity of profitability with respect to investments, as well as to assess the investment sensitivity of tourism clusters. Regression analysis, Fisher test, and correlation indices confirmed the high statistical significance of the obtained dependencies, and forecast models for 2026 allowed us to quantitatively assess development scenarios under different rates of investment in security technologies and marketing digital solutions. Thus, the model in question is actually a system of economic and mathematical equations (linear, power, logarithmic, hyperbolic) constructed in the article, which describes the relationship "investments – security innovations – profitability – cluster competitiveness". Its novelty lies in the combination of three dimensions:

1. Financial (assessment of capital investments and profitability).
2. Innovation (assessment of the impact of security technologies).
3. Marketing and management (taking into account the interaction of entities in tourism clusters).

It is this complexity that allows us to consider a tourism cluster not as a set of isolated enterprises, but as an integrated system, where investment decisions have a multiplier effect due to joint marketing promotion, exchange of innovations, and use of a common security infrastructure. This expands the boundaries of previous approaches (Flagestad & Hope, 2001; Pinto et al., 2015) and forms a theoretical and practical basis for developing adaptive strategies for the development of tourism clusters in conditions of instability and military risks.

CONCLUSIONS

The conducted research allowed for a comprehensive reveal of the specifics of financing investment projects on security innovations in the marketing management system of tourism cluster business structures, and to establish their determining influence on the efficiency of the functioning of the tourism industry. Analysis of modern scientific approaches demonstrated that clustering of tourism activities is a key tool for increasing regional competitiveness, as it creates conditions for the formation of innovative, partnership, and financially sustainable relations between enterprises, state institutions, and cultural and recreational facilities. Research into the role of digitalization, innovation, and human capital confirmed that it is these factors that provide the basis for the implementation of modern models of marketing management capable of responding to crisis and security challenges, building tourist trust, and strengthening the positioning of tourism clusters in the market. Analysis of financial and economic indicators of cluster entities revealed a clear positive relationship between the growth of the share of capital investments in the tourism sector and the increase in the profitability of enterprises, which confirms the high effectiveness of directing investments into security innovations. The use of economic and mathematical methods and the construction of linear and nonlinear production functions allowed not only to quantitatively describe the relationship between investment flows and the efficiency of tourism enterprises, but also to substantiate forecast scenarios for 2026, which indicate a further increase in profitability even under conditions of moderate investment in innovative and security solutions. The generalization of the research results made it possible to formulate practical recommendations for strengthening the competitiveness of tourism clusters, which include increasing investments in security technologies, strengthening marketing interaction between cluster participants, the use of digital tools for managing tourism demand, and the development of standardized security mechanisms. Therefore, financing investment projects focused on security innovations is a strategic prerequisite for increasing the effectiveness of marketing management of tourism cluster business structures and forms a new model of sustainable development of the tourism industry of Ukraine in the context of war and post-war transformations.

A promising direction for further research is the development of models for assessing the long-term impact of startup cluster integration on the sustainability of local economies in the context of war and post-war transformations. It also seems advisable to study in-depth the mechanisms of interaction between financial instruments, security technologies,

and the innovative potential of communities to form adaptive development strategies. Further research can focus on modeling scenarios of international startup internationalization and their role in shaping the innovation profile of regions in global value chains.

ADDITIONAL INFORMATION

AUTHOR CONTRIBUTIONS

All authors have contributed equally.

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CONFLICT OF INTEREST

The Authors declare that there is no conflict of interest.

REFERENCES

- Andriushchenko, K., Tepluk, M., Boniar, S., Ushenko, N., & Liezina, A. (2019). Influence of cost drivers on value-oriented management of investment activity of companies. *Investment Management and Financial Innovations*, 16(3), 353-364. [http://dx.doi.org/10.21511/imfi.16\(3\).2019.31](http://dx.doi.org/10.21511/imfi.16(3).2019.31)
- Blahun, I. S., Dmytryshyn, L., Blahun, I. I., & Blahun, S. (2022). Stock Indices as Indicators of Market Efficiency and Interaction. *Economic Studies journal, Bulgarian Academy of Sciences - Economic Research Institute*, 8, 87-106. <https://ideas.repec.org/a/bas/econst/y2022i8p87-106.html>
- Carson, D. A., & Carson, D. B. (2018). International lifestyle immigrants and their contributions to rural tourism innovation: Experiences from Sweden's far north. *Journal of rural studies*, 64, 230-240. <https://doi.org/10.1016/j.jrurstud.2017.08.004>
- Davydenko, N., Buriak, A., Demianenko, I., & Buriak, M. (2021). Assessment of the Components of Financial Potential of the Regions of Ukraine. *Journal of Optimization in Industrial Engineering*, 14(1), 57-62. <https://doi.org/10.22094/JOIE.2020.677816>
- Davydenko, N., Titenko, Z., Buriak, A., & Polova, O. (2021). The impact of climate change on the investment attractiveness of agricultural enterprises. IOP Conference Series: Earth and Environmental Science. <https://doi.org/10.1088/1755-1315/915/1/012016>
- Dmytryshyn, L., & Blahun, I. (2016). A model for achieving the allocative efficiency of credit resources in Ukraine's banking system. *Banks & Bank Systems*, 11(3), 8-16. [https://doi.org/10.21511/bbs.11\(3\).2016.01](https://doi.org/10.21511/bbs.11(3).2016.01)
- Dwyer, L., Edwards, D., Mistilis, N., Roman, C., & Scott, N. (2009). Destination and enterprise management for a tourism future. *Tourism management*, 30(1), 63-74. <https://doi.org/10.1016/j.tourman.2008.04.002>
- Dykansky Historical and Local History Museum named after D.M. Garmash (2025). Interactive museum events. <https://dikankamuseum.wixsite.com/museum>
- Ferreira, J. M., & Estevão, C. M. (2009). Regional competitiveness of a tourism cluster: A conceptual model proposal. *Tourism & Management Studies*, 5, 37-51. <https://www.redalyc.org/pdf/3887/388777675004.pdf>
- Flagestad, A., & Hope, C. A. (2001). Strategic success in winter sports destinations: a sustainable value creation perspective. *Tourism management*, 22(5), 445-461. [https://doi.org/10.1016/S0261-5177\(01\)00010-3](https://doi.org/10.1016/S0261-5177(01)00010-3)
- Jackson, J. (2006). Developing regional tourism in China: The potential for activating business clusters in a socialist market economy. *Tourism Management*, 27(4), 695-706. <https://doi.org/10.1016/j.tourman.2005.02.007>
- Hallenga-Brink, S., & Brezet, J. C. (2005). The sustainable innovation design diamond for micro-sized enterprises in tourism. *Journal of Cleaner Production*, 13(2), 141-149. <https://doi.org/10.1016/j.jclepro.2003.12.021>
- Hjalager, A. M. (1996). Tourism and the environment: the innovation connection. *Journal of Sustainable Tourism*, 4(4), 201-218. Iordache, C., Ciocinã, I., & Asandei, M. (2010). Clusters-Tourism Activity Increase Competitiveness Support. *Theoretical & Applied Economics*, 17(5). <https://store.ectap.ro/articole/470.pdf>
- Kaganzi, E., Ferris, S., Barham, J., Abenakyo, A., Sanginga, P., & Njuki, J. (2009). Sustaining linkages to high value markets through collective action in Uganda. *Food policy*, 34(1), 23-30. <https://doi.org/10.1016/j.foodpol.2008.10.004>
- Kamianets-Podilskyi Museum (2025). Interactive museum events. [http://muzeum.jn.ua/Kubitskyi, S., Yeremenko, D., Danylenko, V., Bataiev, S., & Varaksina, E. \(2024\). Evaluating the impact of innovative technologies on global competitiveness through modelling. *Multidisciplinary Science Journal*, 6. <https://doi.org/10.31893/multiscience.2024ss0710>](http://muzeum.jn.ua/Kubitskyi, S., Yeremenko, D., Danylenko, V., Bataiev, S., & Varaksina, E. (2024). Evaluating the impact of innovative technologies on global competitiveness through modelling. Multidisciplinary Science Journal, 6. https://doi.org/10.31893/multiscience.2024ss0710)
- Kopishynska, O., Utkin, Y., Galych, O., Makhmudov, H., Svitlychna, A., & Lyashenko, V. (2021). Case method in the study of information technologies and IT project

- management. *Journal of Systemics, Cybernetics and Informatics*, 19(8), 198–211.
<https://doi.org/10.54808/JSCI.19.08.198>
17. Kovalchuk, S., Morokhova, V., Bondarenko, O., Mohylova, A., & Dankevych, A. (2024). Creative Economy and Value Creation through Marketing Analytics: New Approaches and Opportunities. *Pakistan Journal of Life & Social Sciences*, 22(2), 9812–9824. <https://doi.org/10.57239/PJLSS-2024-22.2.00741>
18. Kubitskyi, S., Shchokin, R., Fedoruk, O., Horokhivska, T., & Shorobur, I. (2023). Management of Higher Education Institutions as a New Tool for the Development of Higher Education. *Journal of Curriculum and Teaching*, 12(2), 74–82. <https://doi.org/10.5430/jct.v12n2p74>
19. Li, P., Zhou, Y., & Huang, S. (2023). Role of information technology in the development of e-tourism marketing: A contextual suggestion. *Economic Analysis and Policy*, 78, 307–318. <https://doi.org/10.1016/j.eap.2023.03.010>
20. Lutkovska, S., Martyn, O., Kalinichenko, O., Kulyk, M., Prokopenko, O., Lesiuk, V., & Lesiuk, A. (2025). Financial and economic management of the efficiency of energy crop production in the system of smart technological development of labor resources. *Management Theory and Studies for Rural Business and Infrastructure Development*, 47(2), 162–173. <https://doi.org/10.15544/mts.2025.13>
21. Muzychenko-Kozlovska O.V. (2006). Methodology for assessing the level of tourist attractiveness of a region. *Regional Economy*, 1, 218–228.
22. Najda-Janoszka, M., & Kopera, S. (2014). Exploring barriers to innovation in tourism industry—the case of southern region of Poland. *Procedia-Social and Behavioral Sciences*, 110, 190–201.
<https://doi.org/10.1016/j.sbspro.2013.12.862>
23. Nitsenko, V., Dankevych, A., Dzoba, O., Ustenko, A., & Bashynska, Y. (2024). Ethical and social incentives for the transformation of the business model of enterprise management in conditions of sustainable development. *Naukovyi Visnyk Natsionalnoho Hirnychoho Universytetu*, 4, 172–179. <https://doi.org/10.33271/nvngu/2024-4/172>
24. Novelli, M., Schmitz, B., & Spencer, T. (2006). Networks, clusters and innovation in tourism: A UK experience. *Tourism management*, 27(6), 1141–1152.
<https://doi.org/10.1016/j.tourman.2005.11.011>
25. Official Internet resource (2025). Official website of the Patriot Tourist Enterprise. <https://patriot.zt.ua/>
26. Official Internet resource (2025). Official website of the Nika Tour Voyage Travel Agency. <http://nika-tour.net.ua/uk/home/>
27. Opendatabot – tracking open data of Ukraine (2025). <https://opendatabot.ua>
28. Pan, W., Xie, T., Wang, Z., & Ma, L. (2022). Digital economy: An innovation driver for total factor productivity. *Journal of business research*, 139, 303–311.
<https://doi.org/10.1016/j.jbusres.2021.09.061>
29. Pinto, H., Cruz, A. R., & Combe, C. (2015). Cooperation and the emergence of maritime clusters in the Atlantic: Analysis and implications of innovation and human capital for blue growth. *Marine Policy*, 57, 167–177.
<https://doi.org/10.1016/j.marpol.2015.03.029>
30. Plakhonik, O., Syladii, I., Kubitskyi, S., Koycheva, T., & Krulko, L. (2024). Formation of an effective management system in the educational space of higher education institutions. *Amazonia investica*, 13(74), 344–360.
<https://www.webofscience.com/wos/woscc/full-record/WOS:001250068700029>
31. Rowan, N. J., & Galanakis, C. M. (2020). Unlocking challenges and opportunities presented by COVID-19 pandemic for cross-cutting disruption in agri-food and green deal innovations: Quo Vadis? *Science of the Total Environment*, 748, 141362.
<https://doi.org/10.1016/j.scitotenv.2020.141362>
32. Salvador, R., Simões, A., & Soares, C. G. (2016). The economic features, internal structure and strategy of the emerging Portuguese maritime cluster. *Ocean & Coastal Management*, 129, 25–35.
<https://doi.org/10.1016/j.ocecoaman.2016.04.012>
33. Sitnicki, M., Horbas, I., Derkach, O., Flowers, A., Wielewska, I., Tucki, K., Zuzek, D., & Pimenov, S. (2024). Development and support of Ukrainian Domestic Entrepreneurship in the Knowledge Economy. *Sustainability*, 16(13), 5682.
<https://doi.org/10.3390/su16135682>
34. State Agency for Tourism Development of Ukraine (2024). <https://www.tourism.gov.ua/blog/u-2024-turistichna-sfera-ukrayini-prinesla-v-byudzhet-mayzhe-3-mlrd-grn>
35. State Agency for Tourism Development of Ukraine (2024). <https://www.tourism.gov.ua/blog/statistika-bude-dani-shchodo-splati-turistichnogo-zboru-za-2020-rik>
36. State Statistics Service of Ukraine (2023). https://ukrstat.gov.ua/druk/publicat/kat_u/2023/zb/11/year_23_u.pdf
37. State Historical and Architectural Reserve (2025). <https://khotynska-fortecya.cv.ua/contacts>
38. Su, C. T., Chen, Y. H., & Sha, D. Y. (2006). Linking innovative product development with customer knowledge: a data-mining approach. *Technovation*, 26(7), 784–795.
<https://doi.org/10.1016/j.technovation.2005.05.005>
39. Tsyganchuk, R. O. (2013). Modeling the production process. Economic characteristics of the production process and their relationship. *Bulletin of the University of Banking*, 1(16), 302–306. http://www.irbis-nbu.gov.ua/cgi-bin/irbis_nbu/cgiiirbis_64.exe?C21COM=2&I21DBN=UJRN&P21DBN=UJRN&IMAGE_FILE_DOWNLOAD=1&Image_file_name=PDF/VUbsNBU_2013_1_58.pdf
40. Tverezovska, N., Kubitskyi, S., Dlubovska, A., Ihnatenko, N., Bodnaruk, I., Lisovyi, V., & Kuchai, T. (2022). Management of the Educational Process Using Information Technologies for High-Quality Training of Specialists in Higher Education Institutions. *JCSNS International Journal of Computer Science and Network Security*, 22(9), 561–568.
<https://doi.org/10.22937/IJCSNS.2022.22.9.72>

41. Vavdiuk, N., Stryzheus, L., Koretska, N., Tendyuk, A., Galushchak, V., Abramova, I., Vasilik, N., & Koshchii, O. (2021). Management of current assets of the enterprises. *AD ALTA: Journal of interdisciplinary research*, 11(2), 30–34. https://www.magnanimitas.cz/ADALTA/110220/papers/A_05.pdf
42. Vavdiuk, N., Koshchii, O., Galushchak, G., Vasilik, N., Smolych, D., Konstankevych, I., & Tretyak, O. (2022). Formation of the soft skills among students of higher education. *AD ALTA: Journal of Interdisciplinary Research*, 2(7), 133–136. https://www.magnanimitas.cz/ADALTA/120230/papers/A_28.pdf
43. Verhun, A., Lozhachevska, O., Mishchenko, M., Budiakova, O., Bakalo, N., Ivanyshyn, A., & Skrypnyk, V. (2022). Management of logistics design of secure development of innovative industrial, agricultural and tourist enterprises in the conditions of martial law. *Journal of Hygienic Engineering & Design*, 41, 260-273. <https://keypublishing.org/jhed/jhed-volumes/jhed-volume-41-fpp-12-antonina-verhun-olena-lozhachevska-maksym-mishchenko-olena-budiakova-stefania-vyshnevska-alla-ivanyshyn-viktoriiia-skrypnyk-2022-management-of-logistics-design-o/>
44. Weidenfeld, A. (2013). Tourism and cross border regional innovation systems. *Annals of tourism research*, 42, 191-213. <https://doi.org/10.1016/j.annals.2013.01.003>
45. Zhou, L., Buhalis, D., Fan, D. X., Ladkin, A., & Lian, X. (2024). Attracting digital nomads: Smart destination strategies, innovation and competitiveness. *Journal of Destination Marketing & Management*, 31, 100850. <https://doi.org/10.1016/j.jdmm.2023.100850>

Барна М., Минів Р., Виноградова О., Черкаський О., Бондаренко С., Мельник І.

ФІНАНСУВАННЯ ІНВЕСТИЦІЙНИХ ПРОЄКТІВ ІЗ БЕЗПЕКОВИХ ІННОВАЦІЙ У СИСТЕМІ УПРАВЛІННЯ МАРКЕТИНГОМ ТУРИСТИЧНИХ КЛАСТЕРНИХ БІЗНЕС-СТРУКТУР

Стаття присвячена дослідженню фінансування інвестиційних проєктів, спрямованих на впровадження безпекових інновацій у системі маркетингового управління туристичних кластерних бізнес-структур. У роботі обґрунтовано, як фінансові рішення, обсяги капітальних інвестицій та інноваційні безпекові технології впливають на ефективність маркетингових стратегій, інструментів комунікації та управлінських механізмів туристичних кластерів. Проведено комплексний статистичний, економічний та економіко-математичний аналіз за 2020–2024 рр., що дав змогу встановити взаємозв'язок між інвестиційною активністю, рентабельністю та результативністю маркетингового управління кластерних суб'єктів. Показано, що інтеграція фінансових ресурсів із маркетинговими інструментами – цифровими каналами взаємодії, кластерною кооперацією, диференціацією туристичного продукту та системами безпеки – формує стійку конкурентну позицію підприємств. Розроблені моделі прогнозування демонструють, що інвестування в безпекові інновації не лише підвищує фінансову результативність, а й оптимізує процеси маркетингового управління, зміцнює кластерну взаємодію та підвищує адаптивність туристичних бізнес-структур до викликів зовнішнього середовища. Практична цінність дослідження полягає в розробці рекомендацій щодо інтеграції безпекових інновацій у систему маркетингового управління туристичних кластерів з урахуванням регіональних особливостей, інвестиційної привабливості та стратегічних пріоритетів сталого розвитку.

Ключові слова: туристичні кластери, інвестиції, рентабельність, інновації, маркетинг, безпека, моделювання, управління, прогнозування

JEL Класифікація: C38, D22, L83, M31, O32, R11