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Cost-Oriented Management of Agritourism Social Infrastructure in Ukraine

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ABSTRACT

In the current conditions of declining tourism activity due to the coronavirus pandemic, Ukraine agritourism needs an appropriate level of investment support from real and potential investors. An effective form of development of agritourism is its development as one of the types of subsidiary production of agricultural enterprises. That is, the agricultural enterprise must be socially responsible and develop infrastructure for tourism. The purpose of the study is to implement N-dimensional model of cost-oriented management based on actuarial accounting at domestic agricultural enterprises in rural areas, the content of which will provide investors with an objective assessment of their value through the prism of actuarial reporting. The object of the study is the process of cost-oriented management of rural agribusiness based on the Actuarial Balance Sheet. The research methodology is based on the application of the 3D-recording method, discounted valuation and 5D-actuarial reporting in displaying information from the actuarial accounting system. Inventions and conclusions. The results of the study showed that agricultural enterprises need to attract investment not only in the development of agricultural production, but also in the development of infrastructure for tourism which could attract tourists and prolong their stay in rural areas. The innovation and value of the results confirmed the effectiveness of the proposed N-dimensional model for cost-oriented management of agritourism social infrastructure on the grounds of accounting and information base of N-dimensional actuarial reporting.

1. Introduction

Ukraine is currently in a rather difficult economic situation due to the introduction of martial law. Moreover, the country, like most countries in the world is experiencing a post-pandemic period, because the impact of the global pandemic COVID-19 on the tourism system at various levels, including agritourism, was quite significant. To support the domestic economy, in particular in the field of food

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security, agricultural enterprises should attract investment not only into the development of agricultural production but also into the improvement of infrastructure for tourism, i.e. into the system of institutions that make up not only territorial but also material as well as organizational basis for agritourism development, especially in the post-pandemic and post-war periods.

Real and potential foreign investors assess the feasibility of investing temporarily free financial resources into the development of an enterprise on the basis of financial statements informational content, which reflects the financial condition of the potential investment object, financial results, cash flows and capital structure, but such documentation is compiled only by large and medium-sized enterprises, the share of which in the agricultural sector of Ukraine is quite insignificant.

In particular, according to the official data of the Ukrainian State Statistics Service, the number of agricultural enterprises of Ukraine in 2020 amounted to 49452 units, of which large enterprises accounted for only 0.1% (36 units), medium enterprises accounted for 4.3% (2134 units). These are the enterprises which compile a complete set of financial statements, the rest of the enterprises are small ones, their share is 95.6% (47282 units), of which 85.0% (or 42042 units) are micro-enterprises that compile simplified financial statements, namely forms № 1-m and № 2-m, and № 1-ms and № 2-ms respectively. Simplified financial reporting does not form the appropriate level of content to interest a real capital supplier, and does not allow to qualitatively assess the value of the business. However, such information content is embodied in the actuarial reporting system, which is the basis of effective costoriented enterprise management. Therefore, the aim of the research topic is to introduce actuarial accounting into domestic agricultural enterprises in rural areas, the information content of which, through the prism of actuarial reporting, will ensure that investors make an objective assessment of their value and will help to attract investment into agritourism social infrastructure.

The originality of the study purpose lies in the development of an Ndimensional model for cost-oriented management of Ukrainian agritourism social infrastructure based on the information content of the Actuarial Balance Sheet (Actuarial Financial Statement). The social infrastructure of agritourism includes: accommodation; catering establishments; road infrastructure; cultural and historical infrastructure; excursion infrastructure; sports infrastructure; production and household inventory; information infrastructure; financial and credit infrastructure, etc. Therefore, the study aims to increase the social responsibility of agricultural enterprises by comprehensively ensuring the development of infrastructure for tourism.

The main drawback of the value-based management (VBM) is that its essence is based on traditional financial reporting, which complicates the process of assessing the economic value of the business, i.e. increases its complexity. Accordingly, the use of N-dimensional actuarial reporting as an information base for VBM will help to improve the efficiency of agricultural enterprise management in the long run and will provide an objective assessment of its value to real and potential investors, which determines the relevance of the study.

2. Literature Review

Agritourism is an important factor in the socio-economic development of the agricultural complex of the country, and prerequisites for this are being formed by the agritourism activity. That is why agricultural enterprises must develop social infrastructure for tourism, but this requires additional investment, both from the state and from investors. Such scientists as Grebenyuk et al. (2021), Denysenko (2021) paid attention to the investigation of these questions, in particular, scientists place a strong emphasis on an innovative approach to the development of tourism and to the hotel and restaurant business as a component of tourism infrastructure. Mainly, the works of Gursoy et al. (2021b) reveal the peculiarities of the pandemic impact on hotel and restaurant activity, the mood and needs of tourists in their place of residence.

Internationally, the dynamics of tourist flows is also studied very carefully, in particular, tourists' choice of hotels is analyzed, and this is primarily due to vaccination demands in the COVID-19 pandemic era. This issue is comprehensively disclosed in the works of Atadil and Lu (2021), Böhm et al. (2019), Chen et al. (2022). In their turn Chen et al. (2021) pay attention to functioning peculiarities of smart hotels as an important component of the tourism social infrastructure. Many scholars suggest new models of tourism flow management and assess the risks of their reliability, in particular, the researches of Cummings et al. (2021) are dedicated to this matter. The level of tourists' trust to travel is revealed in the works of Denton et al. (2020), Gursoy and Chi (2020), Gursoy et al. (2021a). The scientific investigations of Yoon et al. (2019) examine the consumers' intentions to participate in responsible tourism.

The works of Poguda and Rozmetov (2018) reveal in detail and comprehensively the current state of the tourist market development of Ukraine, provide its critical assessment and estimate prospects for development. Brych and Halysh (2020) disclose a resource approach to strategic management of a tourism enterprise. Kazyuka (2021) addresses the problems of improving the efficiency of tourism business management in the context of the COVID-19 pandemic, mainly proposes to use the levers of crisis management influence. Lisovyi and Sikach (2020) examine the development of tourism in rural areas in the context of increasing nonagricultural employment. Pidvalna (2019) substantiates the impact of agritourism on the improvement of socio-economic activities. Vlasenko (2017) reveals the aspects of state support for rural green tourism in Ukraine and abroad. Meanwhile in the research of Plotnikova and Martinchuk (2018) green tourism is characterized as a mechanism for multifunctional development of the state and regions. Lukomska (2016) addresses the issues of agri-business diversification based on active promotion of green tourism as an important innovative direction of agribusiness development, and Nikolayev (2016) explores the development of rural green tourism in Ukraine.

Moreover, Tyshchenko (2018) considers the development of rural green tourism in the context of non-traditional management form.

Therefore, in our study we propose to use a non-traditional approach to valuebased management of tourism social infrastructure in Ukraine centered on the Ndimensional approach of Golden (2016), who was the first to offer presenting financial state and performance results of enterprises in 3D space focusing on the application of traditional financial reporting in spatial interpretation. In our opinion, this approach should be the basis of the N-dimensional model of cost-oriented management for rural green tourism enterprises based on actuarial accounting and actuarial reporting. The practical introduction of actuarial accounting in agritourism business will help increase the investment attractiveness of this sector of the economy and attract the necessary amount of investment in its development. The basis of such accounting information content is the Actuarial Balance Sheet (Financial Statement), form No1-a. The basics of actuarial accounting and actuarial reporting are disclosed in detail in the works of Shigaev (2011). The place of actuarial accounting in the system of value-based management is thoroughly studied by Rishar and Sokolov (2000), Cutter (2016) and Penman (2013). Mainly scholars characterize actuarial accounting as accounting for the purpose of valuing property as an integral property complex (IPC). Emphasis on the use of actuarial balance data to assess the financial condition of the enterprise as an IPC is carried out in the research of Kulikova and Semenikhina (2013), who in particular propose to calculate the surplus (deficit) of business value after the actuarial valuation. However, the need to increase the investment attractiveness of rural agribusiness in Ukraine, in terms of value-based management of agritourism social infrastructure development, centered on the concept of actuarial accounting, has not yet been investigated in detail and allaround, which necessitated research in this field.

3. Methodology

The main purpose of the study is to implement the N-dimensional model of value-based management at agricultural enterprises of Ukraine in rural areas centered on actuarial accounting, the content of which, through the prism of actuarial reporting, will provide investors with an objective assessment of their value and promote investment in agritourism social infrastructure development. This will solve the problem of agritourism growth in the context of rural ancillary industries reforming.

The research basis for the study constituted the Ukrainian public joint-stock company Agrifirm Provesin, which is conducting agricultural activity in rural areas and can serve as a type of ancillary production for the development of agritourism when attracting investment.

The research methodology is based on the application of 3D-recording method, actuarial calculations, discounted valuation, 5D-actuarial reporting and classical mechanics methods in displaying information from the actuarial accounting system onto 3D force accounts to develop N-dimensional model of cost-oriented

agritourism social infrastructure management in Ukraine on the basis of the information content of the Actuarial Balance Sheet (Actuarial Financial Statement).

3.1. Modeling the level of agritourism investment attractiveness

Modeling the level of investment attractiveness of agritourism enterprises is carried out on the basis of reporting, which is transformed into the N-dimensional format in the actuarial accounting system. According to the Actuarial Balance Sheet (Actuarial Financial Statement), form №1-a, the investor immediately sees the prospects of business value changes. That is, actuarial reporting is the basis of value-based management (VBM) of agricultural enterprises. Its main difference from traditional reporting is that the actuarial accounting system uses the pricing method through the discounted value of future cash flows.

Therefore, the method of discounting was used in the research process as an important mechanism that allows to provide reliable information about the financial state of the enterprise, as the current value of future financial flows may differ significantly from the nominal value. Any, even complex discounting operations are reduced to a single formula:

$$PV = \frac{FV}{\left(1+i\right)^n},\tag{1}$$

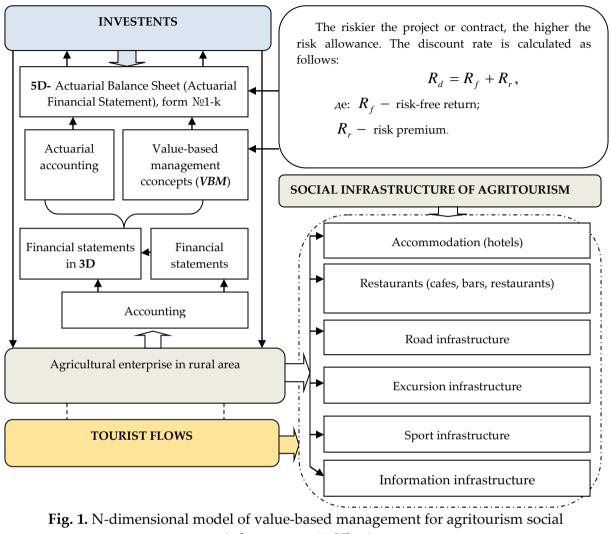
where PV – is current value; FV – is future value; i – is the discount rate; n – is the number of periods before maturity date.

The amount of discounting depends on the discount rate. In this case, each fixed value of the expected future value may correspond to several values of the *discounted value*, depending on which *discount rate* is selected. Thus, determining the *discount rate* is a key point, as well as in the process of compiling the Actuarial Balance Sheet (Actuarial Financial Statement).

3.1.1. N-dimensional model of value based management for agritourism social infrastructure

A possible "quick" option for the discount rate, although not ideal, is the discount rate of the National Bank of Ukraine (NBU). The discount rate should be taken on the date of the Actuarial Balance Sheet (Actuarial Financial Statement), form N $^{\circ}$ 1-a. Among the possible ways to calculate the expected rate of return on equity one can consider the Capital Asset Pricing Model (CAPM) which is based on economic and statistical methods.

According to the Actuarial Balance Sheet (Actuarial Financial Statement), the investor immediately sees a change in the economic value of agribusiness in the long run, which underlies the concept of value-based management (VBM), which aims to maximize the shareholder value of agricultural enterprises. Attracted in this way investments into one of the types of auxiliary production of agritourism - agricultural enterprises will promote the development of agritourism social infrastructure. To this end, we have developed an N-dimensional model of value-based management for agritourism social infrastructure in Ukraine based on the information content of the Actuarial Balance Sheet (Actuarial Financial Statement), Fig. 1.



infrastructure in Ukraine *Source:* Authors' elaboration

Fig. 1 illustrates that the discount rate determination is usually based on the so-called "safe" or guaranteed level of return on financial investments provided by the National Bank of Ukraine on transactions with deposits or securities. This may take into account the *risk allowance*.

The study of the problem of agritourism activity development in the conditions of reforming rural ancillary industries was carried out on the basis of increasing the level of their investment attractiveness through the prism of actuarial reporting and included the following stages:

• At the first stage, the discount rate was chosen at the level of the NBU discount rate;

• At the second stage, the discounted value of assets and liabilities was determined: fixed assets and intangible assets; financial investments; unfinished construction; receivables; long-term loans and borrowings;

• At the third stage, the Actuarial Balance Sheet (Actuarial Financial Statement), Form Nº1-a, was compiled, and the surplus (deficit) of agribusiness value was determined as a basis for improving the image of its investment attractiveness in the market and attracting funds into its development as an important agritourism constituent.

4. Results and Discussion

The development of rural areas of Ukraine is a complex task, but it can be reduced to solving two main problems: the development of rural social infrastructure and support for the village economic development, says Pidvalna (2019). Rural tourism (or agritourism) is a holiday in the countryside (village, hamlet, farmstead), during which tourists lead a rural lifestyle, get acquainted with local culture and customs, discover traditional rural work and take part in it.

Agritourism is one of the promising areas of the tourism industry development, as in many countries it attracts a significant proportion of foreign tourists. Italy, Spain, Ireland, France and Switzerland are particularly striking examples.

Ukraine, especially its western part, has a very rich tourist and recreational potential, with beautiful landscapes (such as the Prut-Bukovina Carpathians) in rural areas. Bukovyna, a historical part of Western Europe, is a very attractive investment region. Currently, its northern part is Chernivtsi region of Ukraine, and the southern part is a Romanian territory. According to the rating of investment attractiveness for the Ukrainian regions, Chernivtsi region is quite a promising one.

However, the global pandemic COVID-19, as well as the military operation (which began on February 24, 2022) significantly changed the situation in the tourist market of Ukraine. According to the official State Statistics Service of Ukraine, the number of tourists served by tour operators and travel agents, by type of tourism in 2020 compared to 2019 decreased by almost three times, Table 1.

Table 1 shows that over the past 20 years the total number of tourists who visited Ukraine increased by 346.3 thousand people, or by 17.19%. The largest flows of tourists were typical for 2008, 2012 - 2013, and 2018 - 2019. In particular, in 2019 the number reached its maximum and amounted to 6132.10 thousand people, but in 2020 their number decreased by 3771.82 thousand people or by 61.51% against 2019 and amounted to 2360.29 thousand.

Among the tourist complexes of Chernivtsi region, which are located in rural areas, quite attractive for tourists are: tourist complex "Kozacky Hutir", tourist complex "Coast of Love", "Quiet Farm" vacation site in the Carpathians, tourist complex "Sunny Valley", guest house "Fisherman's", entertainment and recreation complex "Valeria", restaurant "Kolyba" in Myhovo, recreation complex "Georg Park".

		Including						
Years	Number of tourists served by tour operators and travel agents, total	incoming (foreign) tourists	outbound tourists	domestic tourists				
2000	2013998	377871	285353	1350774				
2001	2175090	416186	271281	1487623				
2002	2265317	417729	302632	1544956				
2003	2856983	590641	344332	1922010				
2004	1890370	436311	441798	1012261				
2005	1825649	326389	566942	932318				
2006	2206498	299125	868228	1039145				
2007	2863820	372455	336049	2155316				
2008	3041655	372752	1282023	1386880				
2009	2290097	282287	913640	1094170				
2010	2280757	335835	1295623	649299				
2011	2199977	234271	1250068	715638				
2012	3000696	270064	1956662	773970				
2013	3454316	232311	2519390	702615				
2014	2425089	17070	2085273	322746				
2015	2019576	15159	1647390	357027				
2016	2549606	35071	2060974	453561				
2017	2806426	39605	2289854	476967				
2018	4557447	75945	4024703	456799				
2019	6132097	86840	5524866	520391				
2020	2360278	11964	2125702	222612				

Table 1. Dynamics of the number of tourists served by tour operators and travel agents,according to the tourism type in Ukraine for 2000 - 2020 (persons)

Source: Adapted from State Statistics Service of Ukraine Primary data: http://www.ukrstat.gov.ua

In order to ensure the socio-economic efficiency of agritourism activities in Chernivtsi region, it is necessary to attract foreign investment in its development. An effective form of agritourism growth (rural green tourism) is its development as one of the types of ancillary production of agricultural enterprises. The information base for attracting investments is the accounting system and financial statements of agricultural enterprises. However, since 95.6% (47282 units) of agricultural enterprises of Ukraine are small and micro in size, they compile a simplified form of financial reporting: Balance Sheet (Statement of Financial State) and Statement of Financial Results (Statement of Comprehensive Income) form N $^{\circ}$ 1-m and N $^{\circ}$ 2-m, and N $^{\circ}$ 1-ms and N $^{\circ}$ 2-ms respectively. Simplified financial statements do not provide an appropriate level of information and are not able to secure an investor or other capital provider.

To overcome this problem, we proposed an N-dimensional model of valuebased management for agritourism social infrastructure in Ukraine (see Fig. 1), which is based on the transformation of traditional financial reporting into 3D, according to Golden (2016), and application of actuarial accounting as well as reporting at agricultural enterprises Shigaev (2011). In particular, for small and micro agricultural enterprises we propose to compile an Actuarial Balance Sheet (Actuarial Report on Financial Status), form №1-a. This will help to build an effective system of value-based management (VBM) according to actuarial accounting data as studied by Risha and Sokolov (2015), Cutter (2016) and Penman (2013). Moreover, the Actuarial Balance Sheet (Actuarial Financial Statement) will increase the image of the investment attractiveness of an agricultural enterprise in rural areas, and will help attract investment in the development of social infrastructure for agritourism.

As an example let us use the official financial statements of a public agricultural company Provesin, which is located in Western Ukraine. In particular, we will transform the Balance Sheet (Financial Statement) into a 5D-Actuarial Balance Sheet (Actuarial Financial Statement) according to the official website Stock Market Infrastructure Development Agency of Ukraine SMIDA (SMIDA).

As a discount rate we will choose the average annual refining rate of the National Bank of Ukraine, which on 31.12.2021 amounted to 9.92%.

Then we determine the discounted value of long-term loans. The content of other long-term liabilities of the public joint-stock company Provesin on 31.12.2021 is presented in Table 2.

Tı	ransaction	Cost, thousand UAH	Yield rate	Maturity, years	Note
	1	2	3	4	5
Intere	est-free rate	9016,0	-	2	-
TOTA	AL	9016,0	X	X	X

 Table 2. Other long-term liabilities of the public joint-stock company Provesin on 31.12.2021

Source: Authors' elaboration

The discounted value of the interest-free loan to the public joint-stock company Agrifirm Provesin will be:

 $PV = 9016 \div (1+0.0992)^2 = 9016 \div 1.20824064 = 7462.09 \text{ muc.cph.}$ (2)

We calculate the discounted value of unfinished capital construction (unfinished capital investments). The information required for the calculation is presented in Table 3.

According to the approach of Rishar and Sokolov (2000), the discount rate for unfinished construction was used at 13% (percentage of normal profitability for the relevant period and type of agricultural production).

Table 3. Information on the object of unfinished construction at public joint-stock company
Agrifirm Provesin on 31.12.2021

Commissioning period	Estimated initial cost,				
	thousand UAH				
2	3				
01.01.2024	1656				
	2				

Source: Authors' elaboration

The discounted value of the object of unfinished construction of public jointstock company Agrifirm Provesin will be:

$$PV = 1656 \div (1+0,13)^3 = 1656 \div 1,442897 = 1147,69$$
 тис.грн. (3) Discounted value of intangible assets - Table 4.

Transaction	Initial cost,	Discount rate	Useful life,	Note
	thousand UAH		years	
1	2	3	4	5
Intangile assets	10,0	9,92	2	-
TOTAL	10,0	X	X	X

Table 4. Intangible assets of public joint-stock company Agrifirm Provesin as on 31.12.2021

Source: Authors' elaboration

$$PV = 10 \div (1 + 0.0992)^2 = 10 \div 1.20824064 = 8.28 \text{ muc.sph.}$$
(5)

After calculating the discounted value of all assets and liabilities on the balance sheet of public joint-stock company Agrofirm Provesin, the final stage - preparation of the Actuarial Balance (Actuarial Financial Statement), form Nº1-a.

P	'AC Ag	rifirm Prov	vesin on 31	1.12.2021, thousan	d UAH		
Asset	Line	At the	At the end	Liability	Code	At the	At the end
	code	beginning	of the		line	beginning	of the
		of the	reporting			of the	reporting
		reporting	period			reporting	period
		period				period	
1	2	3	4	5	6	7	8
	erating as			Net	financial li	abilities	
I. Operat	ting assets	(OA)		I. Fi	inancial ass	ets (FA)	
Operating cash	5000	514	303	Financial	5200	-	-
				investments in cash			
Receivables	5005	7477	7734	and cash equivalents			
Inventories	5010	3662	3629				
Other current assets	5015	8964	9004	Other financial	5205	4062	1148
Fixed assets	5020	7057	6381	assets			
Other non-current assets	5025	10	8				
Intangible assets							
Total for section I	5030	27684	27061	Total for section I	5210	4062	1148
II. Operati	Ŭ		1	II. Financial liabilities (FL)			
Accounts payable and	5035	429	3090	Short-term loans	5215	2801	2780
accrued liabilities				and the current part			
Deferred tax liabilities	5040	-	-	of long-term loans			
Accounts payable on	5045	14191	19089	Promissory notes	5220	-	-
settlements with the				payable			
budget and non-budget							
funds							
Other long-term liabilities	5047	9016	7462	Long-term loans	5222	-	-

Table 5. 5D-Actuarial Balance Sheet (Actuarial Financial Statement)

Total for section II	5050	23636	29641	Total for section II	5225	2801	2780
III. Net operating assets (OA-OL)	5055	4048	5716	III. Net financial liabilities (FL-FA)	5230	(1291)	(1632)
					IV. Equi	ty	
				Registered capital	5236	12546	12546
				Retained earnings (uncovered loss)	5237	(9789)	(13064)
				Total for section IV	5245	2787	(518)
				The difference in the enterprise valuation - property complex - surplus (deficit)	5250	-	6234
BALANCE	5100	4048	5716	BALANCE	5300	4048	5716

Source: Compiled by the authors according to SMIDA; adapted from Kulikova and Semenikhina (2013), Shigaev (2011)

Primary data: https://smida.gov.ua/about

In Table 5 we used the approach of Kulikova and Semenikhina (2013) to determine the deficit (surplus) of the business economic value.

According to the results of calculations presented in Tables 2, 3, 4 and 5, we see that the economic value of the studied agricultural enterprise exceeds the book value by 6234.00 thousand UAH. This is due to the implementation of actuarial calculations based on the discounted value of future cash flows which may interest real and potential investors. According to the 5D-Actuarial Balance Sheet (Table 5), the investor sees additional benefits from investing in this agricultural enterprise and prospects for increasing the economic value of agribusiness, so he makes a positive decision to invest in public joint-stock company Agrifirm Provesin.

Accordingly, as an agricultural enterprise must be socially responsible and develop infrastructure for tourism, the investments attracted by public joint-stock company Agrifirm Provesin should be invested in the development of tourism infrastructure, as economic factor (lack of investment) is the first cause hindering the development of agritourism in Ukraine.

Thus, the purpose of the study has been achieved and the hypothesis concerning feasibility of implementing N-dimensional model of value-based management based on actuarial accounting in agricultural enterprises of Ukraine in rural areas has been confirmed, the content of which, through the prism of actuarial reporting, will provide investors with an objective assessment and will promote investment in the development of agritourism social infrastructure. This will solve the problem of agritourism development in the context of reforming rural ancillary industries. In contrast to the results of other studies, we have substantiated feasibility of using actuarial accounting and reporting for the development of social infrastructure of agritourism based on improving the image of investment attractiveness of agricultural enterprises in rural areas.

5. Conclusion

Thus, one of the main strategic directions of agritourism social infrastructure development in Ukraine should be an effective system of value-based management (VBM) of agricultural enterprises in rural areas, as one of its subsidiary industries.

Ukraine has the resources necessary for the development of rural tourism. The sights of Ukraine make it an extremely attractive country for all types of tourism: the beauty of nature (lakes, rivers, forests), friendly, hospitable population, diversity of agricultural landscapes, a unique cultural and historical heritage. Transport service in Ukraine is relatively developed, visa-free regime has been introduced.

The proposed N-dimensional model of value-based management established on actuarial accounting is based upon the information content of 5D-actuarial reporting, namely the form №1-a. This form is called 5D-Actuarial Balance Sheet (Actuarial Statement of Financial Status) and is based on a discounted estimate of long-term assets and liabilities value. It is the pricing at discounted value that interests the investor, as it reflects the present value of future cash flows and increases the investment attractiveness of the agricultural enterprise. Accordingly, foreign investments attracted in this way can be directed to the development of infrastructure for agritourism, in particular:

• hotel services (construction of quality accommodation for tourists in rural areas, in particular the organization of a network of rural hotels);

- restaurant business;
- road infrastructure;
- sports infrastructure;
- cultural and historical infrastructure.

Therefore, research is important both nationally and internationally. Prospects for further research will be aimed at improving the hospitality management of Ukraine.

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