Building Engineering 2023; 1(1): 388.
Original Research Article

Project management and partner banking as tools for the recovery concept in Ukraine

Arkadii Sukhorukov[1], Tatiana Yegorova-Hudkova[2,*], Maksim Bojko[3]

[1] *Kyiv National Sikorsky's Politechnical Institute, Kyiv, Ukraine*
[2] *Odesa National Mechnikov's University, Odesa, Ukraine*
[3] *Maksim Odesa, Odesa region Police of Ukraine, Ukraine*
*** Corresponding author:** Tatiana Yegorova-Hudkova, Tatiana1yeg@gmail.com

ARTICLE INFO

Received: 6 November 2023
Accepted: 15 December 2023
Available online: 23 December 2023

doi: 10.59400/be.v1i1.388

ABSTRACT: The main purpose of this study is to investigate the effect of project management and partnership banking. Due to the shortage of investment, Ukraine always needs to plan for finance resource. All over the world the partnership banking is becoming an increasingly common and attractive type of investment in projects. In the conditions of modern Ukraine, the need to restore industrial and infrastructure construction projects one can predict a significant growth in the construction services market and the need of investment. In this study, the ways of possible increasing of investment in construction industry have been discussed based on the use of a logical-structural approach in project management and partnership banking as a source of investment.

KEYWORDS: logical-structure approach; project management; reconstruction; investment; partnership banking; economic security

1. Introduction

In the conditions of the current situation, as a result of military operations in Ukraine, infrastructure facilities, industrial enterprises of various sizes and forms of ownership, objects of social purpose, etc. have suffered significantly.

In October 2023, a third of budget revenues were provided by international support.

According to the Ministry of Finance of Ukraine, without the support of partner countries, there will be a "hole" in the budget of 29 billion dollars in 2024. (06.10.23) and funds have been needed since January. In the draft state budget for 2024, the deficit is −1.57 trillion Ukrainian hryvna (UAH), external borrowings amount to 41 billion dollars. Currently (09.11.2023) the EC is considering the possibilities of financing Ukraine in 2024, but it is counting on the adoption by the Council of the EU of the Ukrainian fund, from which financial assistance will be provided to Kyiv in 2024-27. This decision must be approved by all 27 EU members.

Therefore, Ukraine is expected to have a spending plan from the EU Ukrainian Fund, as well as a recovery and reconstruction plan. For this purpose, the National Council for the Recovery of Ukraine from the Consequences of the War was created in April a consultative and advisory body under the President of Ukraine. What should a Recovery Plan look like?

What is already being done in the EU to help Ukraine?

The EC presented a plan for the EU's immediate response to eliminate Ukraine's financing deficit and long-term reconstruction (Brussels, 18.05.22).

As part of immediate response and needs in the near future, support is provided in the following forms: Macro-financial assistance, budget support, emergency assistance, crisis response and humanitarian assistance. Along with grant support, loans with long repayment terms and preferential interest rates are provided thanks to guarantees from the Union budget.

There will be support. Recovery efforts in the medium and long term should be led by the Ukrainian authorities in close partnership with the EU and other key partners of the G7 and G20, as well as third countries. The EC will work as a general strategic management body responsible for approving the developed reconstruction plan. "Rebuild Ukraine". This plan, based on the assessment of needs, will become the basis for determining priorities, areas of support and specific projects.

To support the plan, the EC proposes to create the "Rebuild Ukraine" fund as the main legal instrument of European Union support through a combination of grants and loans. This will be included in the EU budget with a clear link to investments and reforms.

The possibilities of bank financing are limited due to the fact that it is mainly collateral, short-term and provides for a fairly significant bank interest rate.

Therefore, the study of investment experience in the countries of Asia and the East made it possible to open such a form of investment as partnership, which, according to the authors, is safe from the point of view of economic security requirements and project-like in form.

2. The necessity of doing research

One of the most important sources of investment attraction is the banking system.

The functioning of banks is one of the most important priorities, on which investment attractiveness, stability, solvency, reliability and further development of the state economy and its industries depend. In modern times, both traditional banks and Islamic (partnership) banks function in the world, therefore the banking systems of a number of countries (especially the countries of Southeast Asia, the Near and Middle East) combine both types of banking. The Islamic (partnership) concept of financing is based on the Islamic belief about usury and interest, and prohibits loan interest and loan capital as a basis for usury. In many countries where Islam is practiced, the legislation provides for the operation of both Islamic and traditional banks at the same time. A more modern name for this type of banking is partner banking.

There are about 300 Islamic banks in 80 countries in the world, and only 40% of them operate in Arab countries. Interest in Islamic banking increases the volume of interest-free financing by more than 20% per year. The Islamic concept of financing is project-based in form and safe for the development of the social super-system in content. The specialization of the functioning of the banking system of Ukraine and its comparison with the specialization of Islamic (partner) banking contributes to the need to research theoretical and methodological approaches to assessing the effectiveness of their activities.

The essence of the disorganizing influence of judicial interest on the state of the economy and economic security can be defined as the emergence of undesirable properties of the system and the emergence of dysfunctions.

The logical-structural approach in project management considers the economy and its branches as a nonlinear complex dissipative system, which is structured in accordance with the invariant-variable approach. It provides an opportunity to reveal the transdisciplinary essence of any economic phenomenon.

LSA—Logical Structure Approach was developed by the Agency for International Development in the USA in the late 60s to provide assistance in planning, management and evaluation of processes and activities.

LSA as a project planning and management tool has been adopted by many institutions, such as the Agricultural Development Bank, the International Labor Organization, the German Technical Cooperation Union, the International Labor Organization, the Overseas Development Service, the United Nations Organization for International Development, and others.

Therefore, in accordance with the need to justify the growth strategy of the construction industry of Ukraine in the conditions of economic recovery, attention should be paid to the search for real sources of investment based on partner banking and the development of projects using LFA methodology, investment and construction activities form a powerful creative impulse for the development of related areas of the economy: Metallurgical, mechanical engineering, building materials, furniture, etc.

3. Research background

Sorokin[1] studied "The basis of the change of super systems lies in the change of the dominant truth".

Sukhorukov et al.[2] studied "Transfer of economic crises as a cause of incomplete cycles".

Snooks[3] studied "The impact of singularity is the base of future crisis".

Sidak et al.[4] studied "The Islamic banking prohibit the rate of interested and proposed the fixes sum of payment".

Guide to project management.[5] studied "Structure of methodology accordance to PM Book'".

Sukhorukov and Kharazishvili[6] studied "Forecasting of socio-economic development of the regions and branches of economy of Ukraine".

Yehorova-Hudkova[7] studied "Problem of transdisciplinary in Project Management".

Haken and Haken-Krell[8] studied "Synergetic as a key for analyze of complex non-liner systems".

Yegorova-Gudkova[9] studied "Projecting of steady complexity economic systems on self-organizing principles as a component of anti-crisis strategy and transdisciplinary approach".

Knyazeva and Kurdyumov[10] studied "Synergetic: New universalism of the era of post-non classical science".

Sukhorukov[11] discussed "The indicator of investment safety (the ratio of real investments to GDP) for Ukraine should be at least 25%".

Vlasyuk et al.[12] discussed "The structure of system of economic security of the state depends of framework conditions".

Yehorova-Gudkova[13] studied "Methodological aspects of designing of the sustainable economic systems based on the Law of the Golden Section".

Rose[14] studied "The Cybernetics approach of projecting of the complex system is new competitive strategies proposed by N. Winer".

Lorenz[15] studied "Strange attractor as a characteristic of dynamic chaos".

Lorenz[16] studied "Nonlinear Dynamical Economics and its attractor".

Vitali et al.[17] studied "Lorenz attractor in diagnostic of dynamic stability of open complex system – example of biggest TNK".

Prigozhin and Stengers[18] studied "The impact of time and dissipative structure".

Khitsenko[19] studied "Self-organization of system and: formation of the circuit of the system's operational closure".

Soroko[20] studied "Golden intersections are invariants or attractors of complex open system, it is the base of processes of self-organization and evolution systems".

LSA Book[21] studied "Logical-structural approach and its use for analysis and planning of activities for programs and projects in various fields".

Yehorova-Hudkova[22] studied "Project management as a methodology for preventing the emergence and spread of a crisis".

Coase[23] studied "Transaction costs of a firm as costs of using the market mechanism transaction costs of a firm as costs of using the market mechanism".

Schneider[24] studied "Shadow Economy as amortization of Crisis".

Schneider[25] studied "Shadow Economy and transaction cost".

Sukhorukov[26] studied "Innovation model in construction and impact of managerial factors on national economy".

4. Research objectives

In accordance to the crisis conditions in the construction industry and in the economy of Ukraine as a whole, the country needs investments, first of all, into the construction industry, which generates the restoration of industrial objects, infrastructure and the social and household sphere.

Investments in the construction industry are the most effective because they ensure the creation of jobs and increase the level of employment in the economy for the long term, as well as create a product with a high multiplier of added value.

How to increase the volume of investments and the possibility of financing construction enterprises of various sizes and forms of ownership?

How and with the help of any available methodology is it possible to ensure the efficiency of the use of investments and the fulfillment of all limitations of construction projects in terms of quality, time and budget?

How to ensure the optimization of transaction costs in the construction industry and the transparency of operations in order to prevent increasing the level of shadow economy and violation of economic security requirements at all levels of management of the industry?

The use of a project approach in management in the construction industry creates the necessary conditions for the implementation of a project of a given quality, within the planned time frame and within the planned budget. And if for large construction projects it is expedient to use the methodology proposed by PM Book and Primavera Oracle, then for small and medium-sized projects, from our point of view, it is expedient to use Logical Structure Approach and Microsoft Project because it is more

compact and accessible to project initiators. The possibilities of partner banking, which is project-based in its form and content, perfectly complement the methodology.

5. Planning and control steps

LSA involves the following steps:

1) Analysis of interested parties of the project and compilation of the register of interested parties and SWOT-analysis of it this may include a representative of the partner bank in the conditions of investment by a bank using such a concept.
2) Conducting a "brainstorming session" to identify and approve the main problem of the project. Constructions of the hierarchical tree of problems.
3) Formulation of the main goal of the project and construction of a hierarchical tree of goals. (As mirror image of the problems tree).
4) Carrying out a SWOT analysis of each project stakeholder.
5) Identification of risks and allowed project.
6) WBS (works tree) of the project.
7) Determination of indicators of progress.
8) Construction of a Gantt chart.
9) Construction of the Logical - structural matrix of the project.
10) Completing the calculation of the economic efficiency of the project taking into account the payment of partner banking services.

6. Analyze

Analysis of the project environment:

- Analysis of the legislative environment;
- Analysis of the administrative environment (this includes the possibility of using partner banking);
- Analysis of the technological environment and standards;
- Research of the methodology and its possibilities in accordance with the scope of the project;
- Applied research methods.

6.1. Research method

The project approach considers the construction industry as a nonlinear complex dissipative system, which is structured according to the invariant-variable approach. On the other hand, the project itself is a dissipative or temporary space-time structure. Project management provides an opportunity to reveal the transdisciplinary essence of the system. Complex dynamic systems are divided into dissipative and conservative systems and systems with mixed dynamics. A dissipative system is characterized by the existence of a strange attractor in it that gravitates to a closed invariant set that lies and absorbs it in the phase space of the system within the region that includes all trajectories that cross its boundaries.

The basis of the functioning of a dynamic system is feedback and multiple repeatability. The result of the functioning of a dynamic system is a fractal or an attractor.

In 1963, E. Lorentz discovered an attractor, later named after him, which can be an example of a model of dynamic chaos. It is called the strange Lorentz attractor. Any complex economic system, including the hierarchical system of the construction industry, is open and moves towards an increase in entropy or an increase in the degree of chaos.

If the functioning of the system becomes unmanageable, the conditions for the emergence of crisis situations are formed. Knowing the system parameters and managing them, you can take measures to return the system to normal mode. Attractor is also understood as the aspiration of the system to a relatively stable state in the phase space. When determining the progress indicators of the project during its monitoring, we control compliance with the planned limitations of the project, which is a guarantee of its success. If monitoring indicates negative deviations, then additional budget and time costs are required to return, for example, to the quality regulation, or additional budget costs when returning to the time regulation.

In synergy, such an attractor indicates a stable structural and functional state of the system. At the same time, the entire set of trajectories of the developing system will tend to this steady state, or structure. Strange attractor—the Lorentz attractor is most characteristic of self-organizing systems. Such attractors have a prognostic horizon or a corridor with a period of prediction of system behavior. The space of the strange attractor has a fractal structure and this also extends the possibilities of prediction.

Strange attractors are described by irrational numbers, or Fibonacci numbers, which is a manifestation of the Golden Ratio. Strange attractors exist due to the existence of negative" and "positive feedback" in the system. When the system states are characterized by strange attractors, it becomes impossible to determine their position and behavior at each given moment, although one can be sure that the system is in the attractor zone.

6.2. Method

The algorithm of using the logical-structural approach involves the implementation of interrelated steps: analysis of the context/external conditions, analysis of stakeholders, problem analysis, analysis of goals, action plan, resources, indicators, risk analysis, assumptions[21].

LSA consists of two phases - analysis and planning. The analysis phase consists of four stages: stakeholder analysis, problem analysis, goal analysis, and strategy analysis.

Stage 1: Stakeholder analysis. The first task of the analytical phase is to identify the stakeholders of public policy and their main problems; their potential is assessed. Stakeholders are individuals, groups of individuals or institutions whose interests are affected by the project. The results of such discussion with the participation of interested parties should be used in setting goals, identifying assumptions and risk factors. Both of these tasks are performed sequentially.

One of the most important factors for the success of the project is the behavior and potential of the organizations participating in the project.

The assessment of the level of each of the organizations interested in the project can be carried out using a SWOT analysis.

- Strengths: Internal positive qualities of the organization;
- Weaknesses: Internal negative features of the organization;
- Opportunities: External factors that improve the prospects of the organization;
- Threats: External factors that can undermine the future success of the organization.

Stage 2: Analysis of problems. At the stage of problem analysis, the structure and subject of analysis are determined; obstacles and opportunities for solving problems; identify the main problems faced by target groups (interested persons), identify cause-and-effect relationships and develop a "problem tree".

The algorithm for building a "tree of problems" is characterized by successive execution of the following steps:

1) Determination of the starting (central) problem, the solution of which is aimed at the transformative activity;
2) Determination of the causes of the starting problem;
3) Ordering the causes of the starting problem by systematization, building a hierarchy and cause-and-effect relationships, grouping causes, identifying "clusters of causes" - root problems that are interconnected and united by common origins;
4) Identification and arrangement of the consequences of the central problem;
5) Construction of a "tree of problems" visualization of cause-and-effect relationships of the researched process/phenomenon, which allows to determine the problematic branch of the project/activity. All causes and effects are formulated as negative statements (problems). The degree of depth of the analysis is determined by the limits of the competence of the participants in the discussion (interested parties), i.e., conducting a logical and structural analysis of the problem allows you to find answers to the questions: Whose problem is being solved? What is the essence of the problem? What factors cause the problem? What are the consequences of not solving the problem?

The value of the developed "problem tree" is defined in the ability to formulate goals, tasks and prospects for improving the effectiveness of activities in the researched area on its basis, deepening the understanding of measures and resources necessary to solve the central problem, i.e. activities aimed at eliminating only the starting (central) problem, may be ineffective due to the continued influence of a set of root causes-problems. Conversely, root cause action will lead to a solution to the central problem and will allow changing the consequences of its existence.

Thus, the need to carry out a logical-structural analysis according to the presented algorithm is determined by the difficulties of solving the problem in the future (that is, most of the solutions proposed in the scientific literature to the problem of improving the quality of future specialists, in particular social pedagogues, do not have a universal character, and therefore do not provide a guaranteed increase in the level of professional training). Conducting a logical-structural analysis makes it possible to take into account all factors influencing the problem and to formulate an adequate system of measures to implement the research goal. The results of identifying the cause-and-effect relationships of the investigated problem and building a "tree of goals" make it possible to clearly define the goals and tasks of further transformative activities, which will be effective, expedient and promising.

The relationship between the tree of problems and the tree of goals is determined by dependence: the researched (starting or key) problem is reoriented into the main goal of the transformative activity (project); the consequences of the researched problem - in perspective goals of activity (those that will be indirectly achieved after a rather long time 5–10 years and the results of which are defined as more durable, stable); the causes of the investigated problem are in actions (measures) that have short-term results and the implementation of which can be tracked immediately, that is, the "tree of goals" appears as a positive reflection of the built "tree of problems".

Stage 3: Analysis of goals. While problem analysis represents the negative aspects of an existing situation, goal analysis represents the positive aspects of a desired future situation. It involves reshaping problems into goals - thus, the goal tree can be seen as a positive mirror image of the problem tree.

Stage 4: Determination of the logic of participation. The logic of project participation is a textual

description of the project at each of the four levels of the "hierarchy of goals": actions, results, specific and general goals. Defining the logic of participation is the first stage of drawing up a logical-structural matrix.

Stage 5: Determination of assumptions and risk factors. No matter how well the project is planned and prepared, not everything will go according to plan. The implementation of the project and its ability to self-regulate will probably be influenced by external factors that themselves go beyond the controlled boundaries of the project. For the successful implementation of the project, these conditions should be kept in mind and included as assumptions in the fourth column of the logical-structural matrix. The importance of assumptions must be taken into account: a goal (at each level of the hierarchy of the first column of the matrix) can be considered achieved if and only if the assumption made is satisfied.

Stage 6: Determination of indicators. Only setting (no matter how precisely it is done) the goal is not enough, it is necessary to propose an indicator (indicators) and a metric for assessing progress in its achievement, that is, to ensure the measurability of the goal, it is necessary to give indicators that determine the movement towards the goal and indicate the means of measurement the proposed indicators.

Stage 7: Drawing up a schedule of actions. After filling in the logical-structural matrix, you can move on to further planning of specific activities. Drawing up a schedule of actions is a method of representing actions within the project with the establishment of their logical sequence and interdependence. It is also used as a means of determining the person responsible for the action. The most frequently used design tools are Gantt charts and the critical path method.

6.3. Questionnaire process

Why do we offer to consider the possibility of using partner banking at all levels of the functioning of the construction industry: For the financing of large, medium and small construction projects that do not fall under state financing programs. Partner banking allows you to optimize transaction costs in the construction industry, as it does not involve paying interest on a loan, the rate of which can be revised (under the conditions of a traditional bank), but paying a fixed amount of the bank's remuneration for the entire period of using the funds.

This feature of partner banking also provides transparency of activity and minimization of shadow activity schemes in the construction industry.

The first stage—analysis of minimum interest rates (**Table 1**).

Table 1. List of countries with the lowest lending rates (since 2018).

No.	Country	Annual loan interest rate
1	Switzerland	(−0.75%) (a negative value)
2	Denmark	(−0.65%)
3	Sweden	(−0.5%)
4	Japan	(−0.1%)
5	Bulgaria	0%
6	EU	0%
7	Israel	0.1%

Table 1. (*Continued*).

No.	Country	Annual loan interest rate
8	Samoa	0.14%
9	Great Britain	0.5%
10	Norway	0.5%
11	Fiji	0.5%
12	Czech Republic	0.75%
13	Hungary	0.9%
14	Albania	1.25%
15	Canada	1.25%

Let's consider some countries where the zero rate of partner banking is used (**Table 2**).

Table 2. Rating of countries where assets are compatible with Sharia principles, November. 2019.

Place in the rating	Country	Assets, billion dollars (principles) of Sharia	Total assets, billion dollars the share of bank assets (Sharia principles, %)	The share of bank assets (Sharia principles, %)
1	2	3	4	5
1	Iran	315	315	100
2	Saudi Arabia	133	225	61.3
3	Malaysia	108	358	28.8
4	UAE	86	201	42.7
8	Turkey	22	520	4.3
12	Egypt	7	144	4.9
20	Algeria	1	90	1.1
23	Tunisia	0.8	36	2.2

The experience of these countries shows that the largest global structural crisis of 2008 (which arose as a result of the crisis in the US construction industry) practically did not affect countries 1–4, due to the full or high share of investment based on the principles of partner banking.

The experience of Malaysia in 2008 and later was most often referred to as the Malaysian economic miracle.

The loan interest rate in Ukraine during the same period was: From 13.5% till 18%.

The essence of the disorganizing effect of loan interest on the state of the economy and economic security can be defined as the emergence of undesirable properties of the system and the emergence of dysfunctions. A disorganizing influence on the system leads to an increase in entropy, i.e. testing the entropy of systems or calculating the relative information entropy can be a necessary tool Entropy is a measure of the amount of information associated with different components of the system project in our case. Also, the concept of a Bayesian ensemble of neural networks can be used as a direction for the development of a mechanism for detecting disorganizing actions on the economic security system. When introducing certain filtering criteria and developing a noise distribution algorithm and determining the possibility of managing these criteria, it can be assumed that it will be possible to solve the problem of excitation of system dysfunctions.

The use of Bayes' theorem can be applied to studies of any type of model, provided that they are represented by a set of parameters from which to make assumptions about the distribution. Verification of the correctness of the neural network training technique is possible using the "backpropagation of error" algorithm. Also, for a comparative analysis of the impact of reducing bank interest rates on the level of the shadow economy. From the point of view of action to ensure the conditions of economic security of the mechanism of transaction costs the disorganizing action can be measured and expressed in the growth of transaction costs in the shadow economy, which can be achieved by regulatory action on the part of the state: By reducing loan interest rates or canceling them under the conditions of the specifics and importance of the project, which financed, or in terms of the Islamic concept of financing.

6.4. LSA technique

The result of applying to the logical-structural approach of project management is the logical-structural matrix of the project (**Table 3**).

Table 3. Logical-structural matrix.

Text	Achievement	Indicator measurement	Assumptions and risk
1	2	3	4
General goals	Measurements of achievement of general goals	Sources and methods for confirming achievements	-
Specific goals	Measurements of achievement of specific goals	Sources and methods for confirming achievements	Assumptions affecting the relationship between specific and general goals
Results	Measurements of achievement of results	Sources and methods for confirming achievements	Assumptions affecting the relationship between results and specific goals
Activities	Required resources	Cost of resources	Assumptions affecting the relationship between activities and results

However, this content must be complemented by an in-depth and comprehensive analysis of the project environment. The specificity of LSA technique need for an additional replacement of the main functions, especially:

1) Forecasting and planning of project activities which need the using of indicators of project's environment and comparing it to their threshold values (Entropy testing of the project as the system).
2) Organizing the technology of work from economical information, work from assessing the capacity of the dynamic's indicators will become a project of evaluation and implementation of the robot algorithm from the accumulated information.
3) Coordination and regulation of development processes and implementation of the project in the minds of the middle sector, which is defined by the "security dilemma".
4) Transactional cost is closely related to the material structure of the sovereign system; therefore, they can't be ignored when analyzing the project environment in the conditions of change of demand and proposition.

7. Conclusion

Growth of activity of the construction industry in the interests of the recovery of the economy of Ukraine implies:

First, investment and construction activity give a powerful creative impulse not only in the creation of industrial, infrastructural and social objects, but also contributes to the development of related areas of the economy (metallurgical, mechanical engineering, building materials, furniture, etc.).

Secondly, the indicator of investment safety (the ratio of real investments to GDP) for Ukraine should be at least 25%, and now the mobilization of the economy is no less important than the mobilization of personnel, since development is impossible without the creation of one's own economic base.

Thirdly, it is only through investment and construction design that it is possible to ensure broad frontal innovative development of domestic branches of the economy.

Fourthly, the key to successful attraction of resources for financing and effective organization of investment and construction activities is project management on a scientific basis: the classical approach proposed PM Book and Primavera Oracle and the Logical-Structural Approach together with Microsoft Project.

Fifth, partner banking, which is rapidly expanding in the post-Soviet economic space, can be a source of investment. The bottleneck of ego growth is the personnel problem—the lack of training of specialists of this profile in higher educational institutions of Ukraine.

Author contributions

Conceptualization, methodology, validation, formal analysis, investigation, resources, data curation, writing—original draft preparation, writing—review and editing, visualization, supervision, project administration, AS, TYH and MB. All authors have read and agreed to the published version of the manuscript.

Conflict of interest

The authors declare no conflict of interest.

References

1. Sorokin PA. Social and Cultural Dynamics: A Study of Change in Major Systems of Art, Truth, Ethics, Law and Social Relationships. In: Extending Horizons Books.
2. Sukhorukov A, Yehorova-Hudkova T, Sukhorukova O, et al. Economic security of state: diagnosis, design and stability of system. Journal of interdisciplinary research. 2022.
3. Snooks G. The Dynamic Society: Exploring the Sources of Global Change. Routledge; 1996.
4. Sidak V, Yegorova-Gudkova T, Bojko M, et al. Islamic concept of financing as project and safe for the development of social super-system. Economics, Finance and Management Review; 2020.
5. Guide to project management/Trans.from English Under the editorship S.D. Bushuev, 2nd ed. Business Ukraine; 2000.
6. Sukhorukov AI, Kharazishvili YM. Modeling and forecasting of socio-economic development of the regions of Ukraine: Monograph.
7. Yehorova-Hudkova TI. The system of economic security of the state in conditions of change: Transdisciplinarity, self-organization, nature-like approach: Monograph. Odesa City Typography; 2021.
8. Haken H, Haken-Krell M. Secrets of successful perception. Synergetics as the key to the brain (German). Deutsche Verlagsanstalt; 1992.
9. Yegorova-Gudkova Tatyana. Projecting of steady complexity economic systems on self-organizing principles as a component of anti-crisis strategy. In: Proceedings of the 2012 International Conference on Trends and Cycles in Global Dynamics and Perspectives of World Development.
10. Knyazeva EN, Kurdyumov SP. Synergetics: new universalism or natural philosophy of the era of post-nonclassical science? Philosophy of Nature Today; 2009.
11. Sukhorukov AI. Methodological recommendations for level assessment economic security of Ukraine.

NIPMB; 2003.
12. Vlasyuk OS, Sukhorukov AI, Nedin IV, et al. System of economic security of the state. National International Security; 2010.
13. Yehorova-Gudkova TI. Worldview and methodological aspects of designing sustainable economic systems: The Law of the Golden Section. Coll. science works of the North-Eastern National University named after Volodymyr Dahl. Series: Management. Luhansk. 2014; 26(1): 169-184.
14. Rose J. Survey of Cybernetics. A Tribune to Dr. Norbert Wiener. Iliffe Books, 1970.
15. Lorenz EN. The essence of chaos. University of Washington Press; 1995.
16. Lorenz HW. Nonlinear Dynamical Economicsand Chaotic Motion. Springer; 1993.
17. Vitali S, Glattfelder JB, Battiston S. The network of global corporate control. Chair of Systems Design.
18. Prigozhin I, Stengers I. Time, Chaos, Quantum: Towards a Solution to the Time Paradox. M.: Editorial URSS, 2003.
19. Khitsenko VE. Self-organization: formation of the theory and perspective of social programs. Available online: http://captador.livejournal.com/233506.html (accessed on 2 June 2023).
20. Soroko EM. Golden intersections, processes of self-organization and evolution systems: Introduction to the general theory of system harmony. LIBROKOM Book House.
21. Logical-structural approach and its use for analysis and planning of activities for programs and projects in various fields. Available online: https://blanki-ua.com.ua/blank_zayav/22208/index.html (accessed on 2 June 2023).
22. Yehorova-Hudkova TI. Countering the crisis: the impact of project management, planning and marketing research. Market Economy: Modern Management Theory and Practice. 2022; 21(2): 40-41.
23. Coase RG. The nature of the firm. In the book: Theory of the firm. Economic School; 1995.
24. Schneider F. Size and Development of the Shadow Economy of 31 European and 5 other OECD Countries from 2003 to 2013: A Further Decline. Available online: http://www.econ.jku.at/members/Schneider/files/publications/2013/ ShadEcEurope31_Jan2013.pdf (accessed on 2 June 2023).
25. Schneider F. The Shadow Economy and Work in the Shadow: What Do We (Not) Know? Available online: http://ftp.iza.org/dp6423.pdf (accessed on 2 June 2023).
26. Sukhorukov A. Innovation model in construction. E&FN Spon Chapman &Hall; 1996.