

Nelli HEORHIADI

Doctor of Economic Sciences, Professor

Lviv Polytechnic National University, Lviv, Ukraine

ORCID: <http://orcid.org/0000-0002-8348-5458>

Sviatoslav KNIAZ

Doctor of Economic Sciences, Professor

Lviv Polytechnic National University, Lviv, Ukraine

ORCID: <http://orcid.org/0000-0002-7236-1759>

Olha ZAIATS

PhD (Law), Associate Professor

Lviv State University of Internal Affairs, Lviv, Ukraine

ORCID: <http://orcid.org/0000-0003-2872-5567>

Markiyan-Orest SYZON

Lviv Polytechnic National University, Lviv, Ukraine

ORCID: <http://orcid.org/0000-0002-0133-7372>

Yaryna BOHIV

PhD (Economics), Associate Professor

Lviv Polytechnic National University, Lviv, Ukraine

ORCID: <http://orcid.org/0000-0001-5819-2023>

Olena PAVLENKO

PhD (Economics), Associate Professor

Odessa State Environmental University, Odessa, Ukraine

ORCID: <http://orcid.org/0000-0002-5493-5798>

Irina YEMCHENKO

Doctor of Technical Sciences, Professor

Lviv University of Trade and Economics, Lviv, Ukraine

ORCID: <http://orcid.org/0000-0003-3514-7064>

Olena KALASHNYK

PhD (Economics), Associate Professor

Poltava State Agrarian Academy, Poltava, Ukraine

ORCID: <http://orcid.org/0000-0001-9281-2564>

Svitlana MOROZ

PhD (Economics), Associate Professor

Poltava State Agrarian Academy, Poltava, Ukraine

ORCID: <http://orcid.org/0000-0001-7180-3060>

Serhiy STASEVYCH

PhD (Technics), Associate Professor

Lviv Polytechnic National University, Lviv, Ukraine

ORCID: <http://orcid.org/0000-0002-9985-9485>

**METHODICAL APPROACH TO THE STRUCTURAL
PARAMETERIZATION OF FORMING THE DEVELOPMENT
STRATEGY OF NATIONAL FINANCIAL SYSTEM**

Annotation. *The practical importance of formalizing the formation processes of development strategy of national financial sector (NSF) of Ukraine is proved. The existing methodological approaches to the NSF formation depending on the position regarding the participation of foreign capital in the financial sector, as well as on the existing and desired number of functioning financial institutions are revealed. The methodological approach to the forming the NSF development strategy on the basis of its structural parameterization is proposed. The proposed approach ensures the procedure optimality by checking the compliance developed by the input, output and internal parameters of its validity. The essence and features of each stage of the procedure, their sequence are characterized, as well as the reasonably selected parameters and the sequence of integrating the partial parameters into the integral ones with the further interpretation of the obtained values are explained. The proposed structural parameterization is practically suitable for application and provides control to the developers of the NSF development strategy over the logic and efficiency of its development.*

Keywords: *structural parameterization, financial sector, strategy, development, efficiency.*

1. Introduction

In today's unstable and risky conditions of the Ukrainian economy functioning, the development of its financial component should become the basis for achieving stability and competitiveness [1–25]. The key problem is the development and implementation of a reasonable and realistic strategy for the NSF development, from the standpoint of goals and the current state. The essence of the NSF development strategy, as a reasonable action plan to achieve certain financial goals, provides the application of the scientifically based procedures to its development. It is important to take into account a number of factors and current conditions that objectively affect its formation [1]. At present, one of the key problems is the structural ratio of domestic and foreign capital in the financial sector of the Ukrainian economy, in particular, in the banking sector, and the risks associated with it [2]. The scientific literature [3] notes the positive impact of the European banking capital, which is due to such its advantages over the domestic ones as a high level of corporate management and financial stability. In addition, the European banks' activity in Ukraine is considered to be a guarantee of effective attracting foreign investors that prefer cooperation and investment through the subsidiaries of these banks [4]. The reduction and outflow of the European banking capital and the inflow of the unstable Russian capital is considered to be a serious threat to the domestic banking system. Scientists focus on the need of reorganizing the domestic financial institutions [5], forming the permanent or temporary associations (banking and non-banking holdings) in order to achieve their sustainability [6] and increase competitiveness in the fight for potential customers [7]. As the identification of foreign capital's positive and negative impacts in the financial sector is one of the primary prerequisites for

developing an effective strategy of its development, the impact of key factors on the Ukrainian financial sector development is shown in Table 1. It is noted that this division corresponds to the prevailing existing structure of foreign capital origin in Ukraine.

Table 1

The factor preconditions of forming the NSF development strategy of Ukraine in the context of the foreign capital origin

Influence factors	The type of foreign capital by origin	
	The Russian capital	The European capital
The factors having a positive impact on:		
The resource content of the financial sector	+	+
Reducing the cost of financial resources for legal entities and individuals	+	+
Improving the quality of long-term loan portfolios	-	+
Introducing the latest technologies for the financial services provision and financial transactions	-	+
Improving the key financial indicators and international ratings	-	+
Project finance growth	+	+
Growing confidence of foreign investors	-	+
Open access to international financial markets	-	+
Strengthening the competition and diversification of services in the financial market	+	+
Liberalization of capital movements	-	+
The factors negatively affecting the financial economy sector state of Ukraine:		
Deterioration of the domestic financial sector due to the crisis in the countries of foreign capital origin	+	-
Decrease in confidence in financial institutions of domestic legal entities and individuals	+	-
The devaluation impact on the national currency through the predominant foreign currency financing	-	+
Instability of political relations with the countries of foreign capital origin	+	-
Financing the activity that threatens the financial and general national security	+	-
The arrival of foreign entities with a small capitalization and insufficient financial stability at the domestic market	-	+
Financial sector laundering promotion	+	+

Thus, we have come to the conclusion that the foreign capital presence in NSF, depending on its origin, can both negatively and positively affect in different directions, which should be taken into account when developing a strategy for its development. In particular, the Russian capital has a positive impact on increasing the funding and reducing the resources cost, contributes to increased competition in the domestic market, but does not contribute to the growth of credit ratings and the international confidence in the domestic financial sector, the improvement of the financial services quality and the increase of the openness and liberalization of activities in the financial economy sector. Instead, the predominant positive impact of the European capital is to improve the quality of financial services, bring them up to international standards and implement innovations in the financial sector actively. In addition, it is important to strengthen the confidence of foreign investors in Ukraine and expand the volume of financial services provided to the population, in particular, in the growth of forms of attracting deposits and providing insurance services. Regarding the negative effects of foreign capital, which should be taken into account when developing a strategy for the financial sector development, it should mark the threats to the growing dependence of the Ukrainian economy on external investors, as well as on foreign states, which the capital originates from. Threats from the concentration of European capital in the banking sector are mainly in the national currency depreciation through the predominance of loans provided by the banks with European capital in foreign currency. In addition, it can lead to financial difficulties of domestic borrowers, as well as their insolvency, which predetermines the loss risks of the financial sector stability. Another significant negative impact is the money laundering promotion through European banks and the entry possibility of unstable financial entities with small amounts of capital (the “second level” representatives of European banks) into the domestic financial market, which will not be able to counteract the frequent fluctuations and risks of the domestic financial sector. Regarding the Russian capital, its negative impact is mainly expressed by threats to the national security through the possibility of financing terrorist organizations that operate in Ukraine, as well as the distrust and negative attitude of domestic individuals and legal entities to the Russian capital as a result of the political, military and economic conflict between Russia and Ukraine. In addition, the financial institutions with the Russian origin capital (the most of which belongs to the political activity) can, on the instructions of the parent structures, artificially provoke the negative fluctuations and risks in the Ukrainian financial system. Based on the main factors of the foreign capital influence on the domestic financial sector, before developing a strategy for its development, it is advisable to choose an approach to adjust this capital participation in the development of the Ukrainian financial sector. Concerning such approaches as [8]:

- the liberal approach minimizes the state intervention in the financial sector of the country and is effective in an open financial system, which operates on the principles of its subjects' transparency. Considering the current state of the Ukrainian financial sector and the existence of certain threats to the national security, in particular, from the Russian capital, the further gradual liberalization

is advisable after achieving this economy sector stability, that is, this approach is risky currently;

- the protectionist approach implies the significant state intervention in the processes of the foreign capital entry into the national economy and the presence of numerous restrictive measures and regulations. The application of this approach is also undesirable for Ukraine, since, on the one hand, the domestic financial system requires significant monetary resources injections, and on the other hand, the introduction of significant protectionist restrictions reduces the foreign investors' and partners' confidence, what is negative in the current conditions of integrating Ukraine into the European community;

- the combined approach is expressed in conjunction of the financial market openness with the foreign capital with the effective system of monitoring risks of the financial sector and controlling the capital movement in it, and also installing the transparent legislation and the objective regulators of domestic and foreign subjects' activities of financial activity in Ukraine.

We agree with these authors that it is necessary to use the combined approach in the modern realities of the Ukrainian economy, and consider it to be the most optimal for developing the effective development strategy of the domestic financial sector. The objective confirmation of applying this approach and the importance of foreign capital are that the foreign (European) banks with the highest indicators, which are systemic and have the highest financial stability, are included in group A in the Ukrainian banks viability rate. The leading Ukrainian banks with the average viability level have the positions in group B that is a positive phenomenon and indicates the possibility of improving the existing situation and positive dynamics. The banks with the Russian capital are in group C that indicates the satisfactory viability level. Wherein the assets and volumes of the operations have significantly decreased compared to the previous years, which may indicate the gradual decrease in the Russian capital presence in the domestic financial sector [9]. Taking into account the generalized risks of the banking system, which are mentioned in the works [2–4] – the credit, devaluation, macroeconomic, foreign policy and the other risks, the combined approach use is practically conditioned. The equally important prerequisite for forming the development strategy of the financial sector is the number and specialization of banking and non-banking institutions, and the determined parameters, the achievement of which is desirable after implementing the strategy. Considering the experience of the leading developed economies, one can argue about the need of reducing the number of banking institutions, in particular, through mergers and associations of the available ones to strengthen their financial stability and the regulatory capital volumes that will contribute to strengthening the financial sector stability as a whole. Wherein, the objective regulatory influence and transparent legislation in the banking sector is important in order to avoid monopolizing and maintaining the optimal competitive environment.

In addition to banking institutions forming the basis of the country financial sector, the non-banking institutions, their development features, as well as the number and performance indicators are the important components. Regarding insurance companies, similar to banks, their gradual reduction and elimination

from the market the unstable institutions with a low competitiveness level are observed, while in recent years the insurance reserves volumes have been growing actively. The development dynamics of non-banking credit institutions, in particular, credit unions, also shows a tendency to consolidating and reducing the number of the entities with the little activity and capital cost, which is a positive phenomenon for the domestic financial sector. A positive phenomenon is also a significant increase in the number of financial companies providing financial leasing services (from 47 to 410 for the analyzed period), which has a positive impact on the domestic economy development, primarily providing the Ukrainian enterprises with the opportunities to update the obsolete fixed assets on favorable terms. Such companies in modern conditions should become the basis for reviving the domestic economy and obtaining the competitive advantages by enterprises through upgrading equipment for production processes, which is important when entering international markets. The pawnshops' activity, as active participants of the financial market, is significantly expanded during the analyzed period. At the same time, the excessive concentration of this market among the largest institutions is observed. Therefore, taking into account the number and characteristics of the domestic non-banking institutions is an important condition for developing an effective development strategy for the country financial sector. They are generally characterized by such key problems as the low financial stability and low competitiveness and the domestic entities liquidity compared to the foreign ones, the lack of regulatory legislative support and the transparency of activities, the mistrust among potential borrowers. As in the case of the banking system, it is optimal to reduce their number through the various forms of association to achieve stability, as well as to remove weak players from the market. Also, the development of non-state pension funds, as the participants in the financial sector are particularly important, with introducing the funded pension system in Ukraine, as well as the stock market. In addition, an important condition for successful implementing the NSF development strategy is a high interaction level between banking and non-banking institutions, since the stability and reliability of lending each of the two sectors favorably affect the other's activities.

Based on the described current state and high-risk conditions of the modern NSF functioning, the development of its development strategy should be as objective as possible, taking into account the existing best practices of national economies' emerging from financial crises. In addition, it is equally important to conduct a continuous retrospective analysis of strategic planning in the domestic financial sector in order to avoid previous mistakes.

Setting financial goals is the first step in the implementation of any processes, which involves the development of the desired parameters to achieve according to certain criteria. Regarding the current stage of the NSF functioning, the multi-vector and the lack of hierarchical interdependence of the goals of its development strategy are characteristic.

The key formalized generalization regarding the vision of the strategy of this development is "A comprehensive program for the development of the financial sector of Ukraine until 2020" adopted and approved at the state level

from 18.06.2015 [10]. According to this document, the program objectives are grouped into the following:

- stabilization goals and sustainable development goals are to achieve financial stability by reducing the number of banking institutions, resume optimal lending volumes, clear from the problem assets, grow deposits actively, assess risks objectively, liberalize capital flows, etc;
- infrastructural goals are expressed by improving the functions of Supervisory boards, reducing the influence of state banks, introducing a funded pension system, developing the stock market and growing qualitative and quantitative indicators of insurance, etc;
- the purpose of increasing the protection of customers and creditors provide the improvement of Deposit guarantee systems and losses compensation for investors and other compensation payments, the creation of a unified register of credit histories, etc;
- institutional regulatory objectives reflect the desired state and functions of the financial sector regulators, the introduction of existing and internationally recognized principles of its regulation, the improvement of the domestic legal framework on financial activities.

Judging by the program, there are the fragmentation and lack of an integrated approach in the modern understanding of the NSF development goals achievement, since the goals existing in the current program do not reflect the coherence and interdependence of their achievement. Goals, as well as activities to achieve them are written in the program in different directions and do not indicate their impact on the achievement of the overall result of the NSF development. In addition, the hierarchy of goals with details on strategic regional development goals and strategic development goals of the NSF individual participants, which predetermines the risks of their inconsistency and problematic achievement, is not presented. The hierarchical representation of the strategy objectives with their division into the main and auxiliary ones in the context of the subjects involved in their achievement is well-known in economic practice.

It is important to note that this program specifies the principles of its development and implementation, which objectively determine the necessary rules. Also, in addition to the principles, goals and measures of their achievement, the time parameters for implementing these activities are presented. However, this program representing the NSF development strategy has a number of significant drawbacks. Firstly, the program is formed only from the position of the state regulatory and legislative regulation of the NSF and does not determine the development vectors for the subjects of the regional level and micro-level that indicates an extremely centralized approach to its development. Secondly, the sequence of this program development and strategy, participants and key criteria are unknown. Thirdly, these development goals are not distributed by the achievement levels, which is an important drawback, since achieving the desired results at the national level is not possible without achieving the goals of individual financial institutions and the regional financial sector.

Based on the above, it is necessary to focus on the formation processes of the development strategy of the Ukrainian financial sector from the stage position,

participants, conditions and security. In particular, it is advisable to develop an optimal procedure for forming this strategy as the recommended sequence of stages with simultaneous structural detailing each stage by key components.

2. The aim and objectives of the study

The study aim is to develop a methodological approach to the formation of the NSF development strategy on the basis of its structural parameterization. To achieve this goal, the following tasks should be performed:

- to concretize initial parameters of forming of the NSF development strategy (while doing this task the functional analysis elements, an index method, a method of integration and optimization on the basis of Fishburn's criterion and Sturgess's rules are applied);
- to determine the optimal number and sequence of stages in forming the NSF development strategy (while doing this task, a process approach was applied for the structural modeling method).

3. The initial parameters of forming the NSF development strategy

To achieve a high level of practical and methodological argumentation, forming the NSF development strategy should be characterized by appropriate input parameters, the optimal conversion procedure and a set of desired output parameters. This dependence can be represented in a mathematical way as the functions:

$$Y(p) = F[Z(p), X(p)], \quad (1)$$

where $Y(p)$ – the function of output parameter of the procedure for forming the NSF development strategy; $Z(p)$ – the parameters of executing the procedure for forming the NSF development strategy; $X(p)$ – input parameters of procedure for forming the NSF development strategy.

The output parameters of the procedure for forming the NSF development strategy should reflect the initial conditions and the state of the existing software for developing this strategy. The development of determining the input parameters is offered:

1. The functional parameter of the procedure for forming the NSF development strategy expresses the requirements for this procedure purpose based on its essence. The input functional parameters of the procedure for forming the NSF development strategy: formalizing the procedure (f_{p1}), expresses the clarity and the regulation for its implementation, a certain sequence of stages, their number that provides the understanding for participants and stakeholders; the procedure openness (f_{p2}), reflects the capabilities of information access and transparent at all stages of the NSF development strategy; the object orientation (f_{p3}), involves the specificity and individual approach to the applicable stages of the procedure with the characteristics of the NSF development strategy; the results functionality (f_{p4}) is expressed by the procedure ability to ensure the development of the practically useful and potentially effective strategy for the NSF development.

The generalized result of determining the correspondence of the procedure

to the partial functional parameters is the formation of the input functional parameter of the procedure for forming the NSF development strategy (F_p):

$$\left| f_{p1}, f_{p2}, f_{p3}, f_{p4} \right| \rightarrow F_p. \quad (2)$$

2. The structural parameter of the procedure for forming the NSF development strategy describes a quantitative ratio of the elements and stages of the procedure: a qualitative validity of the procedure stages (s_{p1}), reflects the relevance of each stage to the needs of the formation strategy and its maximum information content for the NSF development strategy; the quantitative validity of the procedure stages (s_{p2}), suggests their relevance to the scientific and practical argumentation without the excessive detailization with the excess time and money; the validity of the procedure participants' number (s_{p3}) engaged as performers and coordinators, ensures the appropriateness of participating the recommended number of stakeholders from various sectors and levels of the financial sector; the validity of the competent characteristics of the the procedure participants (s_{p4}), reflects the objectivity of electing coordinators and performers for forming the NSF development strategy for their understanding of the existing problems and the existing experience in the financial sector; the validity of the procedure methodological support (s_{p5}), gives arguments on the expediency of applying a certain procedure of recruitment, methods and technologies of forming the NSF development strategy.

According to a similar principle, the formation of the structural parameter of the procedure for forming the NSF development strategy (S_p):

$$\left| s_{p1}, s_{p2}, s_{p3}, s_{p4}, s_{p5} \right| \rightarrow S_p. \quad (3)$$

3. The resource parameter indicates the optimality and validity of the procedure for forming the NSF development strategy from the position of the resource to ensure its implementation: the procedure efficiency (r_{p1}) expresses the principle of cost minimization for the given quality of the required resources; the optimal procedure duration (r_{p2}), provides for timing each of the stages and the procedure as the whole in the legal or nominal time set at the level of the subjects of macroeconomic regulating the financial sector; the completeness of procedure intellectual security (r_{p3}), reflects the presence of the intellectual resources and funds necessary for the NSF development of. The resource parameter of the procedure for forming the NSF development strategy (R_p) will gain the following form:

$$\left| r_{p1}, r_{p2}, r_{p3} \right| \rightarrow R_p. \quad (4)$$

4. The procedure management parameter of forming the NSF development strategy characterizes the level of its controllability and the feasibility of the corrective influence in the drawbacks identification: the planned procedures (m_{p1}) demonstrates its nonrandom nature as well as the urgency of development relative to the existing situation in the financial sector; the procedure organization (m_{p2}) is

in the presence of responsibility distribution and authority for its implementation; the procedure motivation (m_{p3}) characterizes the presence of the stimulus to performers and coordinators for the effective development strategy; the procedure control (m_{p4}) determines the presence of the evaluator effect on the progress of its stages and identification of the possible gaps in the development strategy; the procedure adjustability (m_{p5}) provides the possibility of rapid correcting the drawbacks in the procedure. The procedure management parameter of forming the NSF development strategy is presented (M_p):

$$\left| m_{p1}, m_{p2}, m_{p3}, m_{p4}, m_{p5} \right| \rightarrow M_p. \quad (5)$$

To quantify the partial parameter values, the binary principle of their submission is applied, i.e. the procedure consistency of each of the partial parameters will gain “1” and the procedure inconsistency will gain “0”. The total value of the integrated parameter will be equal to the sum of the binary values of the partial parameters with the maximum possible value equal to the power of the integrated parameter. That is, the calculation of the parameter values will look like this:

$$F = f_1 + f_2 + f_3 + f_4; F_{max} = F_p; F_p = 4; \quad (6)$$

$$S = s_1 + s_2 + s_3 + s_4 + s_5; S_{max} = S_p; S_p = 5; \quad (7)$$

$$R = r_1 + r_2 + r_3; R_{max} = R_p; R_p = 3; \quad (8)$$

$$M = m_1 + m_2 + m_3 + m_4 + m_5; M_{max} = M_p; M_p = 5, \quad (9)$$

where F, S, R, M is the value of the general functional, structural, resource and management parameters of the procedure for forming the NSF development strategy, respectively; $f_1, \dots, f_4, s_1, \dots, s_5, r_1, \dots, r_3, m_1, \dots, m_5$ are the binary values of the partial functional, structural, resource, and managerial parameters of the procedure for forming the NSF development strategy, respectively; $F_{max}, S_{max}, R_{max}, M_{max}$ are the maximum possible values of the common functional, structural, resource, and managerial parameters of the procedure for forming the NSF development strategy, respectively; F_p, S_p, R_p, M_p are the power shared functional, structural, resource, and managerial parameters of the procedure for forming the NSF development strategy, respectively.

To set the value of the integrated input parameter of the procedure optimality for forming the NSF development strategy, it is necessary to standardize the values of the calculated parameters (6)–(9). Let's use the standardization with respect to the maximum value:

$$z_F = \frac{F}{F_{max}}; \quad (10)$$

$$z_S = \frac{S}{S_{max}}; \quad (11)$$

$$z_R = \frac{R}{R_{max}}; \quad (12)$$

$$z_M = \frac{M}{M_{max}}, \quad (13)$$

where z_F, z_S, z_R, z_M - the standardized values of the general functional, structural, resource and management parameters of the procedure for forming the NSF development strategy, respectively. The standardized values can range from [0; 1]. On the basis of the obtained values, we calculate the integral input parameter of the procedure optimality for forming the NSF development strategy (X):

$$X = \sqrt{p_F z_F^2 + p_S z_S^2 + p_R z_R^2 + p_M z_M^2}, \quad (14)$$

where p_F, p_S, p_R, p_M are the weight coefficients of the overall functional, structural, resource and management parameters of the procedure for forming the RFSU strategy, respectively. We propose to calculate the values of the weight coefficients on the basis of the well-known Fishburn's criterion [11]:

$$p_i = 2 \left(n_x - r_i + 1 \right) / \left(n_x + 1 \right) \times n_x, \quad (15)$$

where p_i is the weight of the i -the general input parameter of the procedure for forming the NSF development strategy; n_x is the number of general input parameters of the procedure for forming the NSF development strategy, $n_x=4$; r_i is the sequence number i of the general parameter of the procedure for forming the NSF development strategy.

The importance in determining the integral input parameter of the procedure optimality for forming the NSF development strategy is the interpretation of its obtained value, that is, the establishment of boundaries that characterize the parameter state. We apply the Sturges's rule for this [12]:

$$h_x = \frac{X_{max} - X_{min}}{1 + 3,322 \lg n_x}, \quad (16)$$

where h_x is the interval length of the the value of the integral input parameter of the optimization procedure for forming the NSF development strategy; n_x is the number of units; X_{max}, X_{min} is the maximum and minimum possible value of the integral input parameter of the optimization procedure for forming the NSF development strategy, $X_{max}=1, X_{min}=0$. As a result of the calculations, the value of the interval $h_x=0.33$ is obtained. According to this, we come to the conclusion about the level of the procedure input optimality for forming the NSF development strategy:

- the low level of optimality [0; 0.33] (means the procedure unsuitability for the application because of its discrepancy to the basic conditions of resource, administrative, functional and structural sufficiency for effective development of the NSF development strategy, therefore, the development of the new procedure is necessary);
- the average level of optimality (0.33; 0.66] (describes the presence of

significant drawbacks in the individual input characteristics of the procedure, so in this case it is necessary to make adjustments to eliminate deficiencies before the use);

– the high level of optimality (0,66; 1] (means the existing procedure suitability of the development to apply and the possibility of development of the NSF effective development strategy on its basis).

The internal parameters that describe the implementation of the procedure for forming the NSF development strategy should determine the consistency and activity of the processes within its stages. The key general parameters within the internal processes of the procedure for forming such a strategy are:

1. The parameter congruence (demonstrates the consistency of all the procedure components, their unity and consistency, which is the key of its successful implementation and expressed by such partial parameters: complementarity and consistency of the procedure stages (k_{p1}), provides for the logical connection and the absence of those stages, the results of which are not applied or make a destructive influence to the NSF development strategy; the consistency of management decisions and conclusions upon the completion of the stages in the procedure (k_{p2}), characterizes their maximum objectivity and a reasonableness level; the consistency of the used methodological support and the functional openness of each of the stages of the procedure (k_{p3}), expresses the inconsistency of scientific methods in forming the strategy and their mutual complementarity as well as the transparency of the functions performed by the participants who are involved in this formation; the deviations minimization in using the given input resources volumes (k_{p4}), is the indicator of transparency and maslovian of the available resources from stakeholders).

The general parameter of procedure congruence of forming the NSF development strategy (K_p):

$$\left| k_{p1}, k_{p2}, k_{p3}, k_{p4} \right| \rightarrow K_p. \quad (17)$$

2. The intensity parameter of the information exchange within the procedure is an important component of its effectiveness. This parameter expresses the power of using the information resources, which makes the formed NSF development strategy more reasonable, complete and practically applicable is expressed by such partial parameters as: the activity of the information exchange profile on the procedure stages (i_{p1}) (demonstrates the completeness of the interaction between the parties regarding the performance of their functional duties within the specific functional direction of developing the strategy, which makes their solution more efficient); the activity of cross-functional information exchange (i_{p2}) (expresses the interaction between the various functional directions of developing the strategy, which achieves the integrity and completeness of the solutions); the activity of the multilevel information exchange (i_{p3}) (is the key parameter of the cooperation between the performers and leaders of the processes of developing the strategy, as well as between the participants representing the different levels of the country financial sector which allows more effectively taking into account the different aspects of the strategy and achieving the positive

results at all the levels of its implementation); the activity of using the retrospective information resources (i_{p4}) (demonstrates the previous experience in developing such a strategy and the functioning characteristics of the financial sector before the current period to apply the proven positive impact tools on the sector and avoid the past mistakes); the activity of introducing and creating the new information resources in the procedure (i_{p5}) (allows not losing the relevance and prospects of the developed strategy concerning the dynamic changes in the environment of its development). This parameter of procedure of forming the NSF development strategy (I_p) is expressed by such dependence:

$$\left| i_{p1}, i_{p2}, i_{p3}, i_{p4}, i_{p5} \right| \rightarrow I_p. \quad (18)$$

3. The time optimality parameter of the procedure reflects its compliance with the specified initial duration, expediency and relevance with respect to the priorities of economic development of the country. is expressed by such basic parameters as: the duration proportionality of the stages of the procedure (t_{p1}) (reflects the optimal ratio of the time spent in various phases, the absence of the significant time gaps between the transitions from one stage to another in the NSF development strategy); the minimization of the time gap between the scheduled and actual treatment duration (t_{p2}) (demonstrates the coherence and timeliness of all the stages of the NSF development strategy); the procedure duration does not lead to the loss of relevance of the desired NSF development strategy (t_{p3}) (means the procedure time parameters can help to solve the current problems of the NSF development and are timely with respect to the prescribed term); the temporal compatibility of the procedure with the strategic changes of other sectors of the domestic economy (t_{p4}) (shows interdependence and interconnection during the process of developing the domestic financial sector with strategic transformations of other sectors). The general internal parameter of the procedure for forming the NSF development strategy will look like this:

$$\left| t_{p1}, t_{p2}, t_{p3}, t_{p4} \right| \rightarrow T_p. \quad (19)$$

We propose to calculate the value of the integrated internal parameter of the procedure for forming the NSF development strategy similarly to the calculation of the input parameter. That is, similar to the formulas (6)–(9) the numerical value of the general internal parameters are determined on the basis of the binary evaluation of their components and K, i, T are got. In the future, these values are standardized according to the principle (10)–(13) and the resulting values z_K, z_I, z_T , the weight coefficients of each of the general parameters are determined by the Fishburn's criterion and the integrated internal parameter of the procedure for forming the NSF development strategy (Z):

$$Z = \sqrt{p_K z_K^2 + p_I z_I^2 + p_T z_T^2}, \quad (20)$$

where p_K, p_I, p_T are the weight coefficients of the general congruence parameter, the intensity of information exchange and the time optimality of the procedure for

forming the NSF development strategy, respectively. We obtain the value that can range from 0 to 1, and conduct the scale based on the Sturges's formula (16). As a result, we get the interval step, which will be $h_z=0,33$. Accordingly, we come to the conclusion about the obtained limits of the value of indicator Z, that is, the procedure internal optimality for forming the NSF development strategy:

- the low level of optimality [0; 0.33] (means the inconsistency of the process of this procedure with the criteria of consistency, completeness of information exchange and proper duration, which necessitates its termination and restructuring);

- the average optimality level (0.33; 0.66] (is characterized by the deviations of the individual partial internal parameters and allows their adjustment while maintaining the existing procedure);

- the high optimality level (0.66; 1] (provides for compliance of processes in the procedure with the criteria of consistency, information content and rational duration, enabling the development of the effective NSF development strategy).

The last group of parameters is the initial parameters of the procedure for forming the NSF development strategy, which describe the timely completion of the procedure, the quality and suitability of the developed strategy to apply. Based on the analytical processing of the author's positions, we believe that the most objective will be such output general parameters:

1. The optimality parameter of the procedure completion (O_p) (characterizes the completeness of the performed works within its limits and the coordination of the accepted final administrative decisions on the statement of the developed strategy. includes the following partial parameters: the integration of the accepted decisions on the chosen strategy (o_{p1}) expresses the management quality of the procedure completion from the standpoint of the consistency obtained in the previous stages of the results; the lack of the not worked options and solutions on the strategy (o_{p2}) characterizes the completeness and validity of the final stage, reinforcing the validity of the developed strategy; the minimum time lag between the approval of the strategy and the beginning of its implementation (o_{p3}) demonstrates the procedure completion, its validity and clarity to ensure the implementation of the further stages of the implementation strategy); the completeness of the management functions according to procedure (o_{p4}) (provides for the implementation confirmation of all management actions for the procedure, in particular, the control and regulation, which make the current strategy reasonable from the possibility of influence on its development and confirm its nonstochastic nature).

The general optimality parameter of the procedure completion takes the following form:

$$\left| o_{p1}, o_{p2}, o_{p3}, o_{p4} \right| \rightarrow O_p. \quad (21)$$

2. The performance parameter of the procedure (E_p) (expresses the characteristics of the created NSF development strategy with respect to its suitability to apply and is described by such partial parameters as: the scientific and practical reasonableness of the NSF development strategy (e_{p1}) – confirms its

validity and objective nature; the realism of the strategy (e_{p2}) – reflects its compliance with the existing problems in the financial sector and adaptability to the specifics of its functioning; the achievability of goals due to the chosen strategy (e_{p3}) – assumes the ability of the chosen strategy to achieve the goals set at the initial stages of the NSF development); the prospects of the chosen strategy (e_{p4}) (characterizes the possibility of its modification and improvement to use in future periods after achieving the established goals about the current problems).

Let's give the general expression of the procedure efficiency parameter:

$$|e_{p1}, e_{p2}, e_{p3}, e_{p4}| \rightarrow E_p. \quad (22)$$

Regarding the calculation of the integrated output parameter of the procedure for forming the NSF development strategy, it is determined similarly before the input and internal parameters are determined, that is, we apply the binary value method of the general output parameters (similar to (6)–(9)), standardize them with respect to the maximum possible value (similar to (10)–(13)) and determine the value of the integrated output parameter of the procedure for forming the NSF development strategy:

$$Y = \sqrt{p_{EZE}^2 + p_{OZO}^2}, \quad (23)$$

where p_E , p_O are the weight coefficients of the general optimality parameter of the completion and effectiveness of the procedure for forming the NSF development strategy, respectively. The weight of the parameters is calculated based on the Fishburn's rule (similar to (15)).

The intervals of the initial parameter values are calculated similarly on the basis of the Sturgess's rule (for (16)). Given that the number of intervals is 2, the value of each interval $h_y=0,5$. Accordingly, we come to the conclusion about the value of the initial parameter:

- the suboptimal results of the procedure for forming the NSF development strategy [0; 0,5] (are expressed by the contradiction of the created strategy and inconsistency of the final decisions regarding its approval, which predetermines the need for its rejection and revision);
- the optimal results of the procedure for forming of the NSF development strategy (0,5; 1] (reflect the suitability of the developed strategy to use and due to it the possibility to achieve the goals of the NSF development, as well as the evidence of the effective managerial influence on the procedure and coherence of its completion, which makes the existing strategy suitable to use).

4. Determination of the optimal number and sequence of stages of forming the NSF development strategy

In addition to the structural elements of the procedure for forming the NSF development strategy, it is important to determine the optimal number and sequence of its stages. We are talking about such stages as:

1. The construction of the “tree of strategic goals” of the NSF development with details on the main and auxiliary strategic goals taking into account the macro-, meso-, and micro-levels of the financial sector of Ukraine. The use of the “tree of goals” of the NSF development, which represents their distribution in the hierarchy, is the most optimal from the position of reflecting their interdependence.

Figure 1 shows the “tree of strategic goals” of the NSF development.

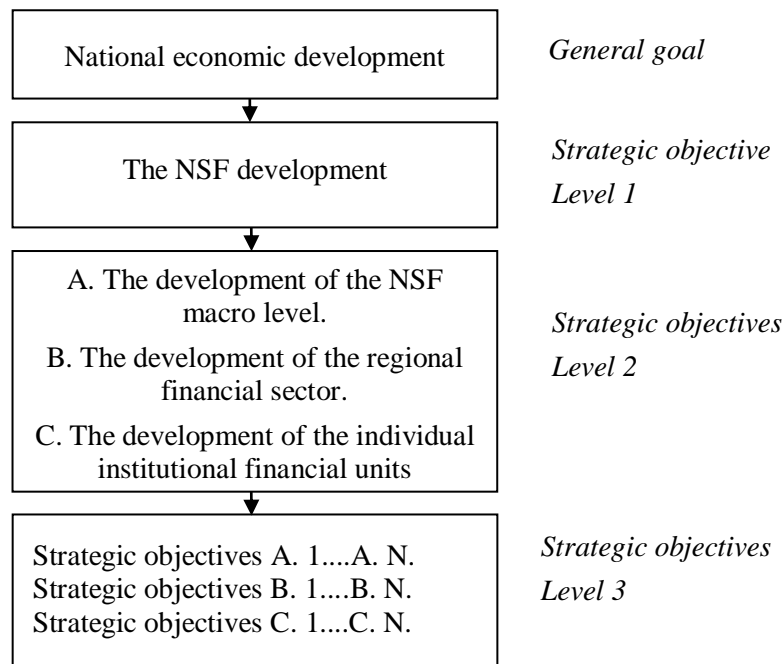


Figure 1. “The tree of strategic objectives” of the NSF development

It should be noted that it is important to take into account the interdependence of the strategic goals at each level of their hierarchy, and the interdependence of the strategic goals at the macro-, meso-, and micro-levels of the NSF development. Achieving macro-level goals is impossible without the participation of the individual financial sector actors. In its turn, to a large extent, the strategic goals for the development of the financial institutions are set and should not contradict the “goals from above”.

2. The strategic analysis of the internal and external environment in which the NSF is developing. In order to obtain the most complete and objective results, we consider it expedient to combine several methods, different in nature – general and specific, heuristic and statistical ones, etc., in the procedure of forming the NSF development strategy (Table 2).

Table 2**The recommended methods of analysis of the internal and external environment of the NSF development**

Analysis environments	Methods of analysis
The internal environment for the NSF development	The life cycle analysis of FSU; SWOT-analysis method; SPACE-analysis method; PIMS analysis method ; the extrapolation method; the bankruptcy forecasting; method of the cluster analysis ; scenario method; heuristic methods (brainstorming, expert evaluation, morphological analysis, Delphi method, etc.); benchmarking correlation and regression analysis, etc.
The internal environment for the NSF development	SWOT-analysis method ; SPACE-analysis method; correlation-regression analysis; statistical analysis; extrapolation method; method of Desk research.

3. Modeling the trends in the NSF development is performed on the basis of the results of the previous stage of analysis of the internal and external environment and is to build forecasts of development, providing the most realistic, optimistic and pessimistic variants of development of events in the financial sector of Ukraine. At this stage, it is advisable to use the various economic and mathematical models with the appropriate criteria for maximizing profitability, minimizing risks, and etc.

4. The development and analysis of the strategic alternatives of the NSF development include the formation of the various possible options for the NSF development, the establishment of the criteria for assessing various developed alternatives of the NSF development strategy. The most common general criteria for any strategy effectiveness is the achievability of goals, the consistency with the development strategies of the other sectors of the economy, compliance with the established restrictions. At the same time, at this stage, it is relevant to use certain methods of analysis, for example, scenarios method, expert evaluation, matrix models of analysis and etc.

5. The choice of the optimal strategy for the NSF development is based on the assessment of strategic alternatives and, first of all, should be ensured by the objectivity and consistency of making strategic decisions. Also, the competence level of experts and subjects responsible for making the financial decisions is important.

6. Determining the conditions for adjusting the NSF development strategy is important from the position of readiness for the possible future negative impacts of the external and internal environment of the domestic financial sector, which can lead to the various bifurcations and require the clarification and adjustment of the existing actions for its development.

7. Detailing the NSF development strategy on the calendar of events ensures the establishment of priority and duration of work within the strategy and allows determining the boundaries of authority and responsibility for its implementation.

5. Conclusions

The developed parameters of the NSF development and its monitoring have been developed. These parameters rationalize the procedure and make it more objective and reasonable. Let us generalize such structural components of the procedure for forming the NSF development strategy:

1. The participants of the procedure, i.e. performers (who directly perform tasks) and coordinators (set and correct tasks, make and/or approve decisions). The parameterization of their number, activity in the procedure and decisions is important and characterizes the competence level and professionalism in the development of the NSF development strategy.

2. The procedure duration as a whole and each of its stages, minimizing deviations from the planned indicators. The parameterization of time characteristics allows keeping the expediency and suitability of the developed strategy of the NSF development.

3. Methodological tools of the procedure. The parameterization of the number of the applied methods, their level and compliance with the modern theory and practice of developing the strategy for the macro-level of the economy provides the scientific and practical validity in forming the NSF development strategy.

4. The functions implemented within the procedure. The parameterization of activities ensures the completion of each stage and the optimal distribution of tasks and jobs between the participants in developing the NSF development strategy.

5. The cooperation within the procedure. The parameterization of the types and activities of interaction at each stage expresses the objective nature of the results of each stage and the procedure as a whole, the absence or minimization of subjective influences and irrational activities in forming the NSF development strategy.

The decisions within the procedure. The parameterization of characteristics of management decisions at its stages allows achieving the high quality of management and providing the effective influence in the procedure for achieving the desirable results.

Therefore, the structural parameterization of the procedure for forming the NSF development strategy will allow providing its optimality and positive effectiveness due to the argumentation of a set of parameters for its analysis. It is important that the application of the recommendations developed by the experts responsible at the highest level for developing the NSF development strategy is possible to form this type of the strategy at the different stages of the financial sector and its various current states.

References

1. Alt, R., Beck, R., & Smits, M. T. (2018). FinTech and the transformation of the financial industry. *Electronic Markets*, 28(3), 235–243. doi: <https://doi.org/10.1007/s12525-018-0310-9>.
2. Prokopenko, O. V., Biloshkurska, N. V., Biloshkurskyi, M. V., & Omelyanenko, V. A. (2019). THE ROLE OF BANKS IN NATIONAL INNOVATION

SYSTEM: GENERAL STRATEGICAL ANALYTICS. *Financial and Credit Activity: Problems of Theory and Practice*, 3(30), 26–35. doi: <https://doi.org/10.18371/fcaptp.v3i30.179455>.

3. Grydzhuk, D. M., & Shvets, N. R. (2019). INCREASING EFFICIENCY OF BANKING ACTIVITY IN UKRAINE BY GOVERNING PRICING CENTERS OF PROFIT OF THE BANK. *Financial and Credit Activity: Problems of Theory and Practice*, 3(30), 4–15. doi: <https://doi.org/10.18371/fcaptp.v3i30.179221>.

4. Kniaz, S. V., Druhov, O. O., Fedorchak, O. Y., & Prochorenko, V. P. (2018). ANALYSIS OF DEVELOPMENT DYNAMICS OF BANKING SECTOR IN UKRAINE. *Financial and Credit Activity: Problems of Theory and Practice*, 2(25), 27–35. doi: <https://doi.org/10.18371/fcaptp.v2i25.135976>.

5. Heorhiadi, N., Druhov, O., Vilhutska, R., Bets, M., Stoianovskyi, A. & Folwarski, M. (2018). Organizational development in banks management systems. *Banks and Bank Systems*, 13(3), 1–11. doi: [https://doi.org/10.21511/bbs.13\(3\).2018.01](https://doi.org/10.21511/bbs.13(3).2018.01).

6. Bashnyanyn, H. I., Kopych, I. M., & Shevchyk, B. M. (1999). *Ekonomichni systemy: problemy strukturyzatsiyi i typolohizatsiyi*. Lviv: Kooposvita.

7. Vladymyr, O. (2014). Shlyakhy zmitsnennya pozytsiy vitchyznyanykh bankiv na rynku bankivskykh posluh Ukrayiny. *Socio-Economic Problems and the State*, 1(10), 221–232. ISSN: 2223-3822. URL: http://nbuv.gov.ua/UJRN/Sepid_2014_1_26.

8. Kornilyuk, R. V., Ivasiv, I. B., & Dyba, O. M. (2012). *Inozemni banky v Ukrayini: vplyv ta rehulyuvannya*. Kyiv: KNEU.

9. Drobiazko, A., & Lyubich, O. (2018). Status and development prospects of banks with foreign capital in Ukraine. *Finance of Ukraine*, 6, 91–106.

10. *Kompleksna prohrama rozvytku finansovoho sektoru Ukrayiny do 2020 roku*: Postanova Pravlinnya Natsionalnoho banku Ukrayiny, 18.06.2015, № 391. URL: <http://zakon2.rada.gov.ua/laws/show/v0391500-15>.

11. Kovalchuk, K. F., Bandorina, L. M., & Savchuk, L. M. (2007). *Otsinka efektyvnosti informatsiyno-intelektualnykh tekhnolohiy*. Dnipropetrovsk: IMA-pres.

12. Sturges, H. (1926). The choice of a class-interval. *J. Amer. Statist. Assoc.*, 21, 65–66.

13. Babych, M., Korobka, S., Skrynkovskyy, R., Korobka, S., & Krygul, R. (2016). Substantiation of economic efficiency of using a solar dryer under conditions of personal peasant farms. *Eastern-European Journal of Enterprise Technologies*, 6(8(84)), 41–47. doi: <http://dx.doi.org/10.15587/1729-4061.2016.83756>.

14. Yuzevych, L., Yankovska, L., Sopilnyk, L., Yuzevych, V., Skrynkovskyy, R., Koman, B., Yasinska-Damri, L., Heorhiadi, N., Dzhala, R., & Yasinskyi, M. (2019). Improvement of the toolset for diagnosing underground pipelines of oil and gas enterprises considering changes in internal working pressure. *Eastern-European Journal of Enterprise Technologies*, 6(5(102)), 23–29. doi: <http://dx.doi.org/10.15587/1729-4061.2019.184247>.

15. Kniaz, S., & Heorhiadi, N. (2016). Structure, possibilities and prospects of the development of virtual economy and creative industries. *Actual Problems of Economics*, 183(9), 346–351.

16. Popova, N., Kataiev, A., Skrynkovskyy, R., & Nevertii, A. (2019). Development of trust marketing in the digital society. *Economic Annals-XXI*, 176(3-4), 13–25. doi: <https://doi.org/10.21003/ea.V176-02>.

17. Kniaz, S., & Luchko, H. (2015). Current state and problems in derivatives market functioning in Ukraine. *Actual Problems of Economics*, 168(6), 347–354.

18. Kniaz, S., & Kosovska, V. (2015). Grounding the need for transfer system development between industrial enterprises. *Actual Problems of Economics*, 170(8), 16–23.

19. Yuzevych, L., Skrynkovskyy, R., Yuzevych, V., Lozovan, V., Pawlowski, G., Yasynskiy, M., & Ogirko, I. (2019). Improving the diagnostics of underground pipelines at oil-and-gas enterprises based on determining hydrogen exponent (PH) of the soil media applying neural networks. *Eastern-European Journal of Enterprise Technologies*, 4(5(100)), 56–64. doi: <http://dx.doi.org/10.15587/1729-4061.2019.174488>.
20. Kniaz, S. (2015). Transfer potential for innovative development of industrial and trade organizations. *Actual Problems of Economics*, 169(7), 57–64.
21. Yuzevych, V., Klyuvak, O., & Skrynkovskyy, R. (2016). Diagnostics of the system of interaction between the government and business in terms of public e-procurement. *Economic Annals-XXI*, 160(7-8), 39–44. doi: <https://doi.org/10.21003/ea.v160-08>.
22. Skrynkovskyy, R. (2008). Investment attractiveness evaluation technique for machine-building enterprises. *Actual Problems of Economics*, 7(85), 228–240.
23. Kniaz, S., Zaiats, O., Shayda, O., Danko, T., Baidala, N., Merezhko, N., Kotsiumbas, O., Lema, H., Protsyk, I., & Holovina, O. (2020). Development of environmental management system by industrial enterprises. *ARCTIC*, 73(3), 56–69. (ISSN: 0004-0843).
24. Skrynkovskyy, R. M. (2011). Methodical approaches to economic estimation of investment attractiveness of machine-building enterprises for portfolio investors. *Actual Problems of Economics*, 118(4), 177–186.
25. Kniaz, S. (2015). The essence of eco-economic, tourism eco-information systems and the interrelation between them. *Actual Problems of Economics*, 171(9), 280–285.