

## IDEF0-MODEL OF THE BANKING SYSTEM'S FUNCTIONING PROCESS

**Statement of the problem.** The banking system in the present situation is the basis for the country's economic relations. Its requires the continuous improvement of activities and enhancement of the functioning which is caused by a significant increase of its influence on economic processes in both domestic and foreign policy of the state. Therefore, evaluation of the effectiveness of the banking system based on adaptive mathematical models and sensitivity analysis of the system to external and internal changes are extremely important.

The selection and application of the mathematical models of assessment and prediction of the banking system's efficiency should be based on the needs of future users of this information. Its necessary to consider the results which will be required a person who will make certain management decisions based on them. One of the main problems of inadequacy of today's methods for assessing banking system, including methods for macro-prudential analysis, is to examine the specific performance of the banking system in isolation, without going into their nature and relationships, which leads to a distortion of the received information. Therefore when developing methods and models on which further analysis of the banking system is carried out, the studying of the main functions and tasks as the entire system so its elements and the exploring the relationships between them are primary. Formed only on the basis previous in-depth analysis of the research object scorecard can fully reflect the level of efficiency of the banking system.

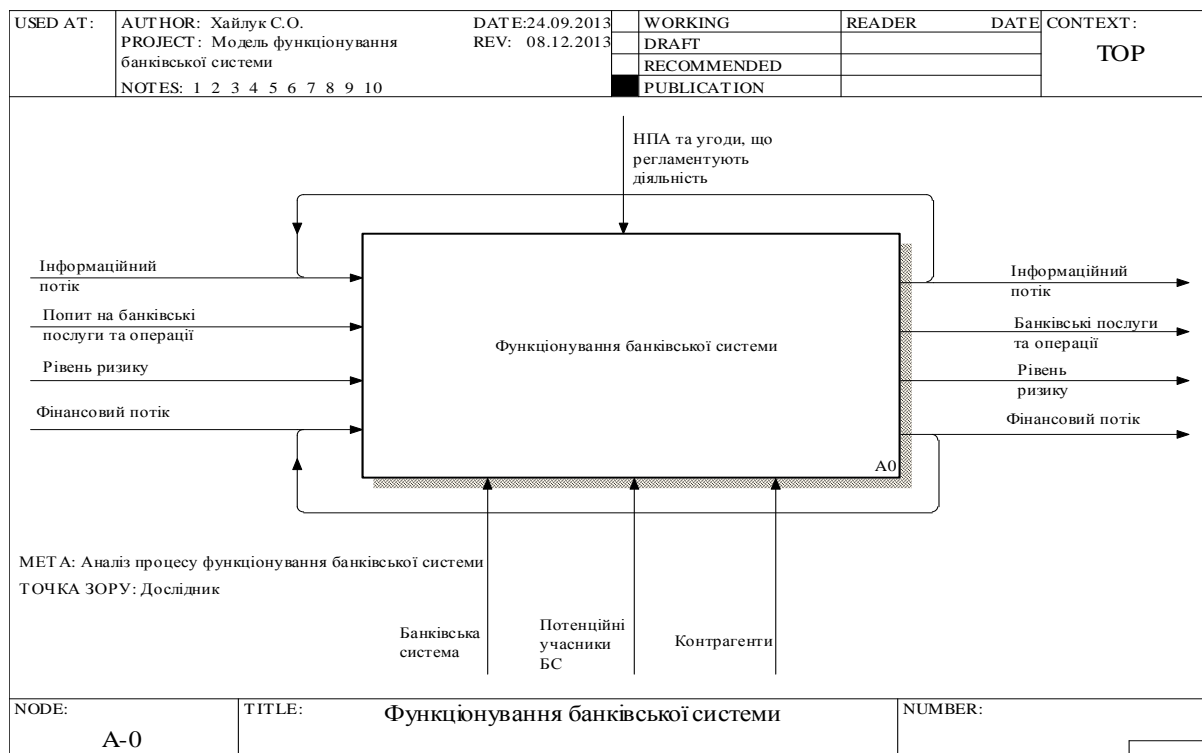
**The analysis of recent research and publications.** Research and construction of models for evaluating the banking system's effectiveness in general are engaged by such scholars as G.T. Karcheva [1], A.E. Kasyutyn, N. Kunitsyn [2], S. Prasolov [5], P.V. Konyuhovskyy [3], A. Pilyavskyy, A. Lupus, J. Maciw, T. Thomas [4], M. Primak [6] and many others. The main tasks to be solved by using these models are a comparative study of several banking systems of different countries in certain areas, determining the optimal structure of the banking system and the factors which are significantly influence to its development and so on. Also the evaluation models of certain aspects of the banking system are quite common. For example, the model of estimating the financial stability of the banking system, its stability, reliability and so on. At the same time, models of estimation the efficiency of the banking sector as a complex system that allow you to assess the ability to perform its functions and to achieve the set goals, are remained insufficiently developed in both theoretical and practical aspects. The permanent complications of the banking system causes the use of special tools for the system describing for further creation of indicated mathematical models.

**Formulation of the problem.** The objective of this study supports the formalization of the description of the banking system's functioning, which will provide the foundation to develop a comprehensive approach to the study of the latter and decision-making in this area. In order to solve this problem is proposed to involve the methodology IDEF (Integration Definition for Function Modeling) [7; 9], which allows us to investigate the structure, parameters and characteristics of industrial-technical and economic-organizing systems. In particular, IDEF0 modeling methodology allows to create a functional model that reflects the structure and function of the banking system, as well as information, financial and other threads that connect these functions. The functional model will provide an overall picture of the formation of the ways to achieve the objectives of the banking system, its main functions, the possible results and required resources for its successful operation.

Development and justification of the first component of the evaluation of the banking system's effectiveness, in particular, the main performance criteria for the banking system, based on the decomposition of the IDEF-model of the banking system's functioning process is the aim of the study.

**The main material of research.** In order to build a functional model of the banking system, consider the basic business processes in the course of its operation, namely the system of consistent, signifies and regulated activities in which the system consistent, whole directed and regulated activities, in which due to the control action the inputs of the process are transformed into outputs - the results of the process that are value to the consumer. Construct a model of the banking system in the notation IDEF0. Contextual top-level diagram of the model of the banking system's functioning is shown in Fig. 1.

As shown in Fig. 1, the banking system as a result of their own activities, guided by normative legal acts and agreements that govern it transforms the demand for banking products, at the same time transforming the financial and information flows, risks and more.

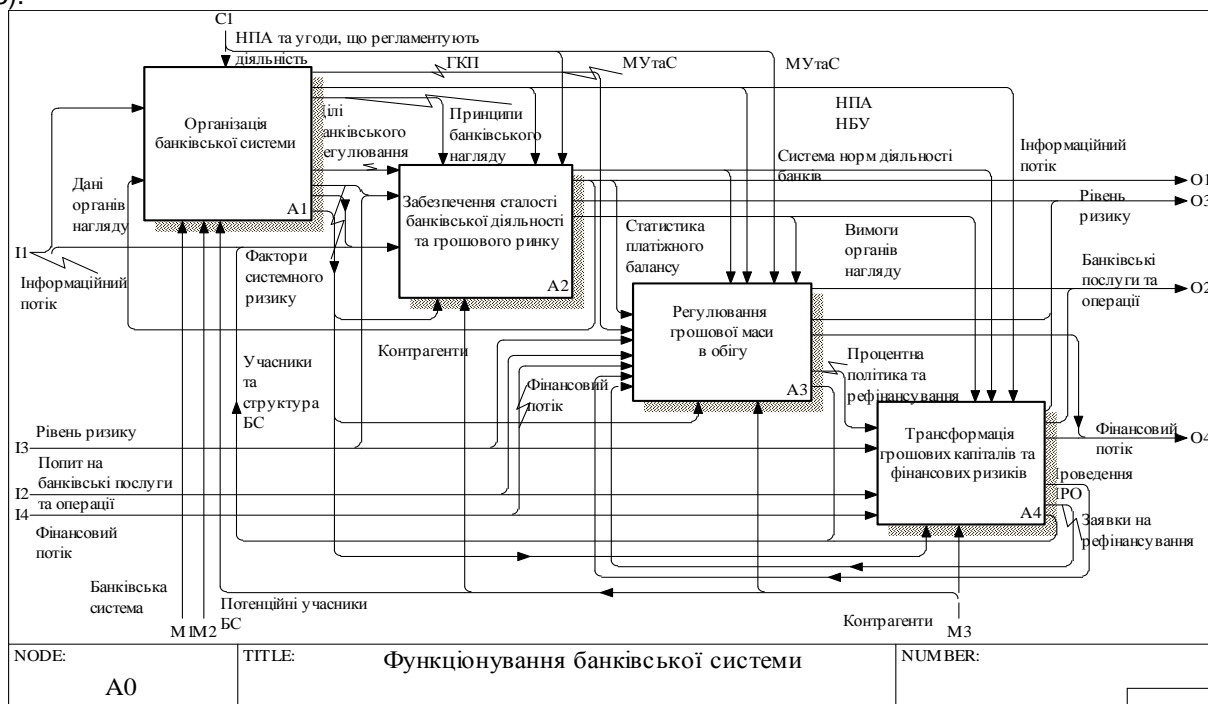


**Fig. 1. The contextual top-level diagram of the model of the banking system's functioning**

The further decomposition of the process of the banking system's functioning using IDEF0 notation and scenario analysis allows to identify the main problems and the successful parties of the system and, consequently, to organize the studied process in the most effective way.

The main activities of the banking system (presented in Fig. 2) are obtained as a result of the selection and processing of the primary functions which are conferred today on the domestic banking system, namely, the directly organization of the banking system, ensuring the sustainability of banking activities and money market, the regulation of money supply in circulation and transformation of money capital and financial risks.

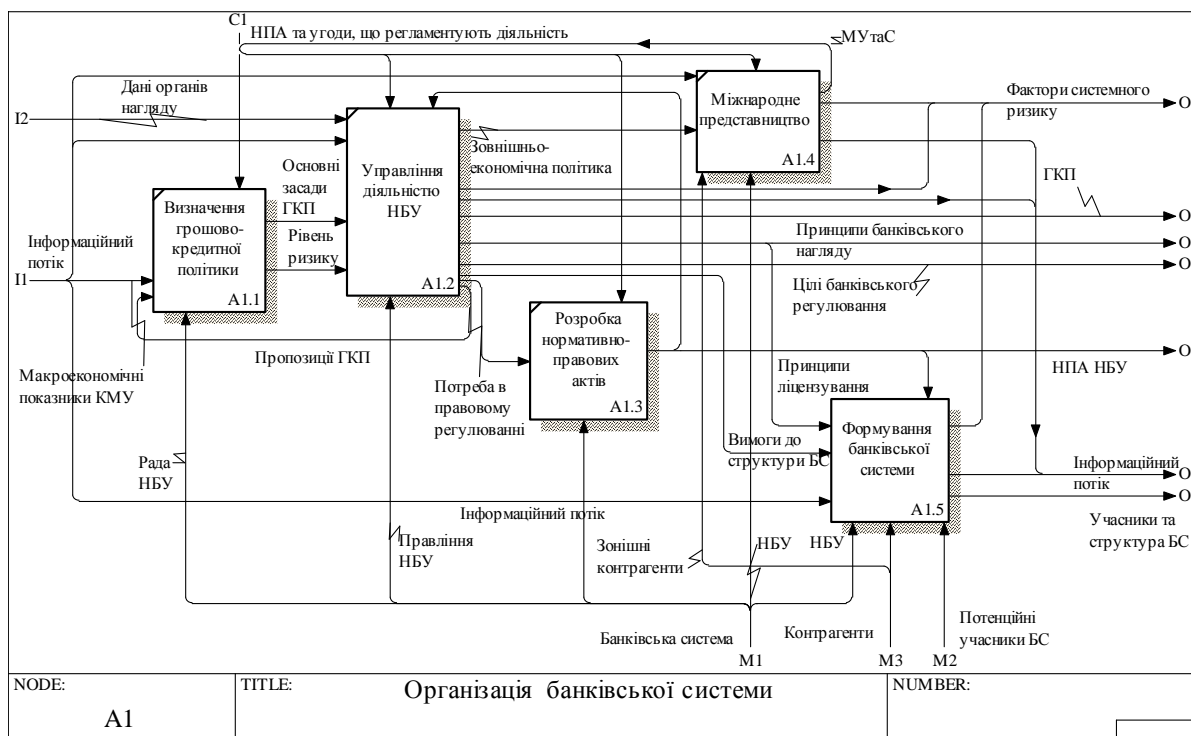
Each of these subactivities is considered more detail and can be divided into several levels. For example, consider the decomposition of the banking system's activities, including the formation of system-wide infrastructure for banking activities and the realization of management of the banking system's activities (Fig. 3).



**Fig. 2. The first-level diagram of the model of the banking system's functioning**

The consideration of the subprocesses of functional model of the banking system up to the fourth level of decomposition allowed the author to form features and the criteria by which the degree of efficiency of the banking system can be seen [9]. However, their definition provides a clear understanding of the concept of efficiency of the banking system, its main functions and tasks.

The author by the term efficiency of the banking system is proposed to understand a property associated with the ability timely, continuously and fully in a high level of external and internal threats, to maintain high quality of their functions, formulate and adopt strategic objectives up to operating conditions, that are constantly changing, and requirements of counterparties, to achieve their goals through the use of socially approved facilities for fixed ratio of costs and benefits and to ensure long-term functioning.



**Fig. 3. The second-level diagram of the subactivities of the organization of the banking system**

Given the above definition of efficiency of the banking system, the main features of the efficiency of the banking system we assign the following. First, the productive condition of the banking system is to ensure its optimal structure and coordinated interaction of its elements - banks - which gives a synergistic effect. Second, banks must be able to meet the needs of society in a variety of banking services and operations. Thirdly, reliability, financial sustainability of banking sector stability and equilibrium in the money and foreign exchange markets, etc., which are extremely important, given the strong instability of economic development in Ukraine and in the world, accelerated changes in the structure of the socio-economic environment and a large openness of economy.

A closer look at the functions and tasks of the banking system allowed to form the basic criteria of efficiency of the banking system [8], namely

- structural optimality of banking system,
- socio-economic efficiency of the banking system,
- financial stability of the functioning of the banking sector,
- the effective functioning of the money market
- the effective functioning of the foreign exchange market.

Each of these criteria is described by a number of indicators which are used for their evaluation and is determined based on a higher level decomposition diagrams of the banking system's process.

#### **Conclusions and further research.**

In the article a model of the business process of the banking system was developed, the analysis of which allowed to formulate and justify the basic criteria of efficiency of the banking system. Constructed on the basis of criteria the integrated multicriteria model of estimation of efficiency of the banking system allow to estimate the latest in terms of ability to perform its functions and to achieve the set objectives. That includes, first, the evaluation of the impact of the banking system as a key component of the financial system and adequate performance of its functions under various exogenous and endogenous disturbances. And,

secondly, the assessment of conformity of results of its operations to the basic social needs and objectives of both society and the individual.

Further studies will be used to justify an integrated approach to the evaluation and analysis of the efficiency of the banking system, which involves the following basic steps: the formation of information database according to the proposed benchmarks and indicators, monitoring, evaluation and analysis of the efficiency of the banking system, scenario approach, reports on the degree of efficiency of the banking system and making recommendations on adjustments to development strategy to enhance the system or upgrade its level.

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### Khailuk S.O. IDEF0-MODEL OF THE BANKING SYSTEM'S FUNCTIONING PROCESS

**Purpose.** Development and justification of the first component of the evaluation of the banking system's effectiveness, in particular, the main performance criteria for the banking system, based on the decomposition of the IDEF-model of the banking system's functioning process.

**Methodology of research.** To solve this problem IDEF methodology is proposed to engage which allows to explore the structure parameters and characteristics of industrial-technical and economic-organizing systems. In particular, IDEF0 modeling methodology allows to create a functional model which reflects the structure and function of the banking system, as well as information, financial and other threads that connect these functions. The functional model will provide the overall picture of the formation of the ways to achieve the banking system's objectives, its main functions, the possible results and resources, which are necessary for its successful operation.

**Findings.** The functional model of the banking system up to fourth level of its decomposition considers the main business processes that occur in the banking system, ie system of consistent, targeted and regulated activities. The main performance criteria of the banking system are formed, namely, structural optimality of the banking system, socio-economic efficiency of the banking system, financial stability of the banking sector, the effective functioning of the monetary market, the effective functioning of the foreign exchange market.

**Originality.** IDEF0-model of the banking system's functioning process was developed. The system of criteria was developed in order to assess the banking system in terms of ability to fulfill its functions and achieve certain goals.

**Practical value.** Developed functional model of the banking system in IDEF0 notation and scenario analysis can be used by experts to identify the main problem and the successful sides of the system and, as a result, to organize of the process that is studied the most effective way.

**Key words:** efficiency, banking system, functional modeling, idef0-model