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MAIN PROBLEMS OF SYSTEM STUDIES OF THE STATE ECONOMY

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Abstract

The article explores the content of the main fundamental problems of system studies of the functioning of the state economy. The basis for writing the article is the modern achievements of leading scientists in the theory of management, system research, and national economy. The author's development consists of adapting the existing results to the peculiarities of the functioning of the national economic system, identifying the typical characteristics of four fundamental problems of system studies of the state economy, substantiating the conceptual theoretical and methodological directions for their solution.

Keywords: system research; economic system of the state; problems of economic research; management of the national economy; efficiency of the economy.

Introduction

System research is the basis for effective management of the economy by the state system. They allow to comprehensively study the content of the structural elements of the system, the strength and direction of their interconnection, to optimize the work of the system, to assess and minimize the external negative impact on the system, to ensure the achievement of target indicators of the functioning of the system, to develop optimal tools of state regulation of the economy. There are various approaches to the methodology of studying the economy of the state, assessing the effectiveness of its functioning and managing economic processes at the macro level. In this direction, the categories, principles, theoretical aspects of analysis and approaches of research activity have been widely studied. Scientists V.N. Shimov, A.I. Korotkevich, E.Z. Maiminas, A.D. Smirnov, V.N. Volkova, A.A. Emelyanov, M. Mesarovic, J. Takahara, Blauberg, E.G. Yudin, M. Mesarovic, J. Takahara, A. Schüller, H.G. Krüsselberg and others made a great contribution to the development of these issues (for more details see the publication [1]). However, there are a number of fundamental problems related to solving the problems of system studies of the state economy, which require a more detailed study. The main difficulty in the implementation of qualitative system studies of the economy is associated with the nonlinearity and dynamism of the system itself and its constituent elements economic processes. The conceptual basis of the results of the study is the understanding of the economic state as a complex, multi-connected, multi-parameter and dynamic system.

Main part

In modern economic literature, there is no single definition of the categories considered in the article, which necessitated their theoretical study. On the basis of a comprehensive study of the categories "system" and "economic system" [1; 2, p. 479; 3, pp. 22–26; 4, p. 37; 5, p. 53], the main substantive characteristics of

the concept of "economic system of the state" were revealed, namely:

- is understood by the authors as a single integral complex system;
- includes various processes and phenomena, as well as connections between them;
- includes a set of interrelated and interacting elements (independent subsystems) that determine the structure of this system and the mechanism of its functioning;
- subsystems are interconnected by stable links and have a certain hierarchy;
- each system can be a subsystem of a larger system [6, p. 26];
- has distinctive essential properties [7], in the process of its functioning it can form new properties;
- implements certain functions;
- the economic system covers "elements of management, economic relations, economic conditions of functioning" [1], economic processes and phenomena;
- structural elements of the system can be presented in the form of abstract models that reflect their connections and mechanism of functioning.

It is these characteristics of the economic system that were taken as a basis for substantiating the main difficulties in the functioning, diagnostics and modeling of the state economy.

Let us present the results of the study of the content of the main fundamental problems of system studies of the economy of the state (the theoretical foundation of the results obtained is the work of V.N. Kalinin [6]).

The first problem. In modern economic thought, the main attention is paid to the study of stable states (structures) of the system. At the same time, the problem of studying the target transition (transformation, development) of the system from one state to another, which is accompanied by a change in the type and degree (strength) of the relationship between its structural elements and a change in the forms and types of relations between the system and the environment, aimed

at forming the macroeconomic policy of the state, achieving the specified development goals at different points in time, remains relevant. All this formed the problem of "building a research model "system – environment"" [6, p. 33]. Within the framework of this problem, two sub-problems are distinguished: 1) description of the state of the system (in the current, transitional and effective (planned) periods); 2) description of the interaction of the system with the environment in order to enhance or minimize (eliminate) the input impact on the system.

The main requirement for the construction of a model is its relative universality for the choice of boundary conditions of its functioning (in the current, transitional and effective (planned) periods) and the type of control action corresponding to them (conditions). The research model "economic system – environment" should: 1) include the main structural elements of the economic system of the state; 2) take into account its main properties (established, acquired); 3) reflect (take into account) the features of a dynamic system; 4) describe (characterize, be an assessment tool) the influence of the external environment (influence) on the state of the system.

As a modeling tool, all the necessary indicators (parameters, boundary conditions) for building a model (a characteristic description of the state of the system and the forms of its interaction with the environment) should have the appropriate quantitative and qualitative characteristics and should be described by mathematical equations (functions). Of no small importance for the qualitative construction of the model is the recognition and identification of the input (control) and output (reaction) system poles, as well as the formation of appropriate methodological tools for these purposes. Special attention is paid to the study of the content (characteristics) of the disturbing environment, its forms and types, as well as the development of methodological tools for managing its (external environment) impact on the state of the economic system. The totality of all the requirements for the construction of the research model "economic system – environment" logically determine the need to comply with a number of conditions (for more details see the publication [8]).

The second problem. As N.L. Gagulina noted, "the formation and functioning of economic systems is subject to general and particular laws" [9, p. 23]. The action of these laws determines the basic properties of economic systems. Let us consider the related problem of analyzing the properties of the system, which includes two groups of properties – structural and dynamic [6, p. 35]. With regard to the study of the economic system of the state as an object of management, the main substantive characteristics of this problem have been identified.

1. The main emphasis in the study of the properties of the economic system is placed on the analysis of the structure of the system. According to the System of National Accounts of the Republic of Belarus, "the economy of the country as a whole is determined from the point of view of institutional units. It includes all institutional units that are residents in the economic territory of the country" [10, p. 9]. As a result, the structural

analysis of the economic system of the state includes the analysis of the following main properties [6, pp. 22, 35; 9, pp. 23, 29; 11, p. 7]: integrity (contribution to the implementation of the target function), structuring (orderliness of the system), coherence, configuration, homogeneity of system elements, openness, completeness, functionality and hierarchy of the structure. The study of the last two properties is of particular relevance at the present time, since in view of the dynamically changing external and internal conditions of the functioning (management) of the institutional units of the country's economy, there is a redistribution of the functions they perform, as well as changes (exclusion, introduction of new) types of connections, both within the system itself and the links of the system with the environment.

2. The greatest difficulty in analyzing the properties of the economic system is the analysis of its dynamic properties and the related study (identification) of movements and reactions (to the impact) of the system, which can be: a) free movements of the system (there is no targeted and accidental impact on the system); b) are conditioned by the corresponding control influence on the system [6, pp. 35, 99]. The greatest attention requires the identification and classification of the types of reactions of the system, as well as their qualitative and quantitative assessment.

To solve the issue (identified problem), it is necessary:

- mathematically describe the free movements of the system;
- mathematically describe the forced movements of the system, determine the type of their connection;
- to identify and describe the types of control influence, to determine their strength and speed of influence (lag link);

The results obtained depend: the choice of a management tool; development of a methodology for building mathematical models describing the functioning of the economic system of the state and its interaction with the environment; quality and efficiency of management activities.

3. The main aggregates of the structural analysis of the country's economic system are: macroeconomic agents, macroeconomic markets, macroeconomic interrelations, macroeconomic indicators [11, p. 44]. At the level of "macroeconomic agents", the most important issue is the identification of the functions they perform.

At the level of "macroeconomic markets": the structure of the formation and redistribution of goods (works, services) consumed in the national economy and supplied to international markets is investigated; The role of markets in the formation of macroeconomic indicators and in ensuring the national and economic security of the country is determined. The study of the category of "macroeconomic relationships" includes: the identification of stable relationships between agents and markets; determination of priority areas that contribute to the solution of the national tasks.

The study of macroeconomic indicators includes a detailed analysis of all the main indicators characterizing the results of the functioning of the state's economy:

gross domestic product, gross value added, gross national income, gross profit, gross savings, indicators of output, distribution of primary incomes, intermediate consumption, net exports of goods and services, and others [12, pp. 12-16]. However, when analyzing and evaluating macroeconomic indicators, it is necessary to take into account those aspects that they do not reflect.

The key indicator of the system of national accounts of the Republic of Belarus is the gross domestic product "characterizing the value of goods and services produced in the country for all types of economic activity and intended for final consumption, accumulation and net export" [12, p. 9].

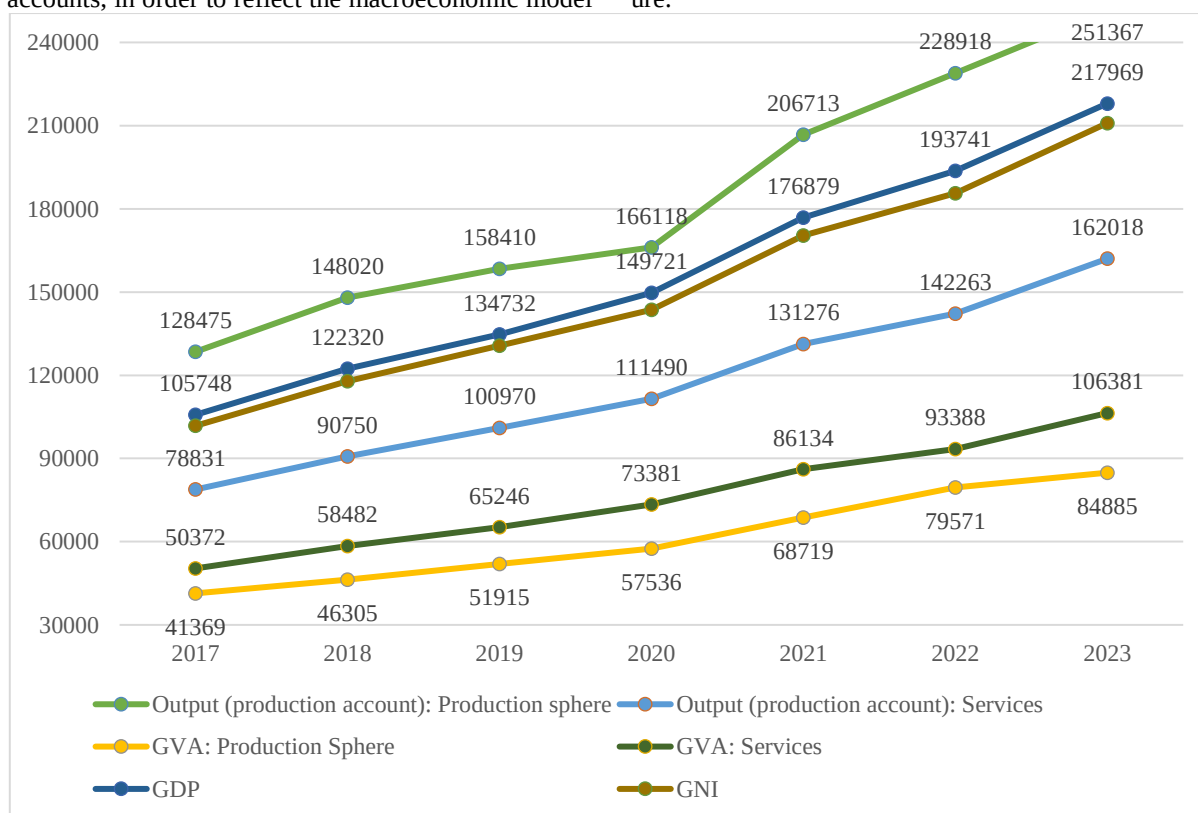
According to scientists, this indicator has a number of shortcomings: it does not take into account: 1) the quality of life (characterized by such indicators as: life expectancy, level of education, environmental situation, crime rate, life satisfaction, etc.). Indicators of the quality of life undoubtedly have an impact on the formation of GDP – this can be traced when assessing the synergistic effect of their management; 2) non-observed economy; 3) future risks; 4) different purchasing power of currencies, etc. All these shortcomings should be taken into account when assessing the effectiveness of the functioning of the state's economic system using the "gross domestic product" indicator.

The second, but no less important, macroeconomic indicator is gross value added – "the difference between the output of goods and (or) services and intermediate consumption, calculated by types of economic activity" [12, p. 12]. In the system of national accounts, in order to reflect the macroeconomic model

about the circulation of flows in the economy, institutional units are grouped into six sectors: non-financial corporations, financial corporations, public administration, households, non-profit organizations serving households, the sector of the rest of the world [10, p. 16]. At the same time, not all sectors of the economy generate added value. The most controversial question in this area is whether value added is formed in the financial sector. As you know, organizations in the financial sector do not pay value added tax on the main type of activity. There is an opinion of leading Belarusian scientists that financial institutions should be subject to value added tax. There are both pros and cons of this opinion. In view of the very large share of cash flows generated in the financial sector, this problem certainly requires more in-depth study.

The third macroeconomic indicator that characterizes the results of the functioning of the state's economy is gross national income – "the sum of primary incomes received by residents, taking into account the balance of primary incomes received from the rest of the world. Gross national income differs from GDP by the amount of primary incomes received from other countries, minus primary incomes transferred to other countries" [12, p. 13]. The greatest difficulty in the study of this area is the qualitative and quantitative substantiation of the permissible (optimal) volume of imports and exports that correspond to the interests (economic, political, national security, etc.) of the state.

The dynamics of individual macroeconomic indicators of the Republic of Belarus is presented in the figure.



Drawing. Dynamics of output of goods (works, services), gross value added (GVA), gross domestic product (GDP), gross national income (GNI), million rubles

Note. Compiled by the author on the basis of data from the National Statistical Committee of the Republic of Belarus [10, 12].

The third problem. Most of the structural elements of the economic system of the state are characterized by the nonlinearity of the equation that describes them [7], which determines the variety of the number of states of the system and forms the third problem – "the problem of observing the state of the dynamic system" [6, p. 36].

"This problem ... Has... applications related to the assessment of a priori unknown state of the system by indirect, external data and signs" [6, p. 37]. The solution to the problem is based on "finding an observation algorithm" [6, p. 37], which makes it possible to determine the current state of the system based on the study of known reactions of the system based on weak signals. A special place in finding this algorithm belongs to the development of appropriate methodological tools for analyzing the state of economic systems, including the analysis of the non-observed economy.

The main place in this process belongs to the identification of parameters that characterize the results of the functioning of the economy. Parameters may include: "the main macroeconomic indicators, indicators characterizing the causes and factors of growth, the measure of the balance of the economy, the type of reproduction, the degree of the country's inclusion in the world economy" [13, p. 54]. In addition, the analysis of the social results of the functioning of the economic system can be singled out as a separate group, which involves the study of such parameters as "the level and dynamics of real incomes, income differentiation, the quality of consumption, the quality and content of labor, the development of the socio-cultural sphere" [13, p. 54] and others.

To solve this problem, it is necessary:

- to determine the indicators that will most accurately reflect the state of the system in its current, transitional and forecast values. Indicators should ensure: 1) the identifiability of the elements of the system; 2) observability; 3) objectivity of reflection and registration of all processes and phenomena of the economy; 4) qualitative assessment of the interaction of the economic system with the external environment;
- to develop a methodology (algorithm) for observing the state of the dynamic system and interpreting the results obtained;
- to develop a methodology for adjusting the threshold values (current, transitional, forecast) of indicators reflecting the results of the functioning of the economic system in the context of the implementation of national goals and development objectives in the current and future periods. The methodology involves the identification of qualitative and quantitative characteristics of parameters that have a significant (key) impact on the functioning of the state's economy and make it possible to determine the current state of the system based on weak signals.

The fourth problem. As N.L. Gagulina rightly noted, "... An economic system is formed by a set of economic agents, as well as mechanisms of economic coordination of their activities, which dominate in relation to other mechanisms and are distinguished by stability" [9, p. 23]. This defines the fourth problem – "the problem of choosing the structural characteristics of the system and the control action" [6, p. 39].

The first component of the problem is the choice of structural characteristics of the system. Its solution involves the selection of priority sectors of economic development with the subsequent justification of the main key parameters, for example:

- growth rates of indicators of sustainable development of the country's economy (gross domestic product, gross value added, gross national income, gross savings, net lending, etc.);
- various structural indicators: the structure of output, the distribution of primary incomes, sources of financing capital operations, etc.;
- quantitative proportions between macroeconomic indicators;
- inflation rate, etc.

The second component of the problem is the analysis of the stability of the system. Stability should be assessed and manifested at all levels of the functioning of macroeconomic agents and macroeconomic markets, the organization of macroeconomic interrelations, and the formation of macroeconomic indicators.

To solve this problem, it is necessary:

- to determine the extremes of the main parameters (marginal conditions) that characterize the state of the economy in different periods of time of its development. Extremes are determined by three time intervals: initial, transitional, and final. It should be noted that during the transition period it can be divided into smaller time periods;
- identify bifurcation points;
- to describe the integral impact of conditionally free and forced movements and reactions of the system, to determine the type of their connection;
- to identify aperiodic links and determine their degrees;
- to assess the level of inertia of the system;
- choose the appropriate (necessary) regulator (proportional, integral, differential, etc.);
- to identify the necessary conditions for the self-stabilization of the system.

Conclusion

Identification of the content of the main fundamental problems of system studies of the state economy is the basis for high-quality management of the system in order to neutralize (minimize the impact) of negative factors and achieve the desired state of the system. The results obtained will allow: to implement the principles of automatic management of the economic system of the state; to increase the adaptability of the economic system to internal and external influences; to increase the ability of the system to self-stabilize; implement the optimal mode of system functioning; to take into account the main difficulties of analysis and observation of nonlinear and non-standard systems; to develop the necessary methodological tools to improve the efficiency of management of economic processes and phenomena in the national economy; to identify the weaknesses of the system in a timely manner and, on this basis, to develop appropriate methodological tools for activating protective functions and implementing preventive mechanisms.

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