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DEVELOPMENT OF THEORETICAL BASES FOR FORMATION OF THE NATIONAL LOGISTICS SYSTEM

Розглянуто багаторівневу таксономію формування національної логістичної системи та особливості логістичного управління на мікро-, мезо- та макрорівнях системи господарювання. Визначено макроекономічну середовищну структуру та показники ефективності логістичної діяльності за рівнями управління. Запропоновано драйвери та систему регулювальних чинників і важелів державного впливу на розвиток національної логістичної системи.

Ключові слова: логістичні потоки, логістичне управління, національна логістична система, державне регулювання логістичної діяльності.

1. Introduction

The processes of globalization, internationalization and transnationalization of the world economy have contributed to the growth of the role of logistics as an effective tool for increasing the efficiency and competitiveness of enterprises in the markets of goods and services. These processes also led to the formation of international transport corridors, global and regional supply chains, powerful logistics clusters and alliances. Logistics has an increasing influence on the formation of the structure of the national economy, determining its profile and the degree of involvement in global logistics networks. The implementation of the Association Agreement with the European Union requires adequate economic transformations and the definition of strategic priorities related to the production of high-tech products and services with high added value in the competitive sectors of the economy. The country's logistics system must ensure the effective movement and storage of manufactured goods.

Therefore, it is urgent to study the theoretical prerequisites for the creation and development of a national logistics system capable of ensuring the improvement of the quality of logistics services in commodity traffic chains and reducing logistical costs in the structure of the national gross product. The prospect of forming a national logistics system is evidenced by the support of the World Bank in developing a strategy for development of logistics in Ukraine.

2. The object of research and its technological audit

The object of research is the system-forming logistical flow processes in the national economy. In order to increase the efficiency of logistics activities at the macroeconomic level, a study was made of the factors and patterns of the formation of national logistics systems capable of stimulating economic growth and increasing the competitiveness of Ukrainian goods in international markets. The experience of the most efficient countries in terms of logistics, in particular Germany, France, the Netherlands [1], shows that the key to their success was

the national logistic strategy. It defined the country's strategic vision and resources to achieve this vision. Similar successes have been achieved by the countries successfully developing – Norway [2], China [3], South Africa [4], Vietnam [5], etc.) The authors [6, 7] summarized the results of a comprehensive study of the impact of logistics activities on economic growth in 34 countries OECD (Organization for Economic Co-operation and Development). And they concluded that the logistics industry provides a significant macroeconomic contribution to the national economy by creating jobs, national income, foreign investment inflows and increasing the competitiveness of other industries. Influence of logistics on productivity and competitiveness of national economy are investigated in [8, 9]. EU experts have identified global trends in the development of logistics and their impact on the effectiveness of national economies of the European community [10].

One of the most problematic areas is the definition of the structure of the national logistics system, the ways of its development and the factors of influence that depend on the features and priorities of the development of the national economy. The new industrial revolution creates unique technological solutions, modifies logistic activities and requires new research.

3. The aim and objectives of research

The aim of research is development of the theoretical foundations for the formation of a national logistics system capable of providing a vertical and horizontal unity of transformational and transactional logistical processes and creating conditions for the realization of the country's powerful logistical potential. To achieve this aim, the following tasks are defined:

1. To substantiate the theoretical basis and conceptual provisions for the construction of a national logistics system.
2. To determine the structure and patterns of the development of national logistics.
3. To develop a system of key performance indicators, factors and levers of state regulation of logistics activities at management levels.

4. Research of existing solutions of the problem

The analysis of scientific papers, in particular [4, 5, 8], prompts to conclude that the problems of the formation and development of national logistics systems are little explored and outlined at the level of common definitions. As a rule, the main attention is paid to the applied aspects of the development of logistics at the macrolevel and directions of improving logistics activities through the prism of reducing logistical costs [2, 3, 9]. The authors [11] defined the macro-logistical system as a system for managing economic flows, attracts intermediary, trade and transport organizations and enterprises of various sectors of the economy and spheres of activity, as well as the economic infrastructure of a single country or group of countries. In contrast, Belarusian scientists define the logistics economy as the science of the most effective use of existing factors of production from the standpoint of a single whole with the aim of satisfying the needs of consumers and goods and services. And they also emphasize the importance of structural organizational-technological and organizational-economic optimization of industrial-technological and economic activity [12]. As the development of the idea, formulated in [13], other Belarusian scientists proposed to consider the national logistics system as a system of supply chain management throughout the country. The basis of such system is a network of logistics centers of varying degrees of functionality that creates conditions for the integration of participants in transport and logistics activities with a view to achieving competitive advantages [14]. In [15] attention was focused on the fact that this is a subsystem of the macroeconomic system. Its feature is a set of interrelated and interacting logistics entities that optimize and rationalize logistical flows. In [16], theoretical foundations for development of regional and interregional transport and logistics systems were formulated. However, the formation of the logistics system in Ukraine and the definition of the direction of its development require constant and more in-depth research.

5. Methods of research

To solve the tasks, the following methods are used: system analysis and system dynamics, synergetics, logical generalization and comparative comparison, system decomposition, general theory of logistics and macroeconomics, and logistics management of flow processes. To determine the starting points of the study, the works [17, 18] were used, in which a new approach to the definition and conduct of the structuring of eco-

nomical systems was proposed, depending on the availability of space-time constraints. In [19] emphasis was placed on the need for a compensatory mechanism for the interaction of economic systems in order to increase their sustainability.

6. Research results

Based on the analysis of the essence of the concept of systemic economy, the concept of creating a national logistics system based on theories of multi-level taxonomy and system stability of the economy and creating the prerequisites for sustainable development of the national economy has been developed (Fig. 1).

At the base of the pyramid, the importance of interaction between the state, business, society and the management system is emphasized, and the specifics of managing logistics flows at the macro level are emphasized.

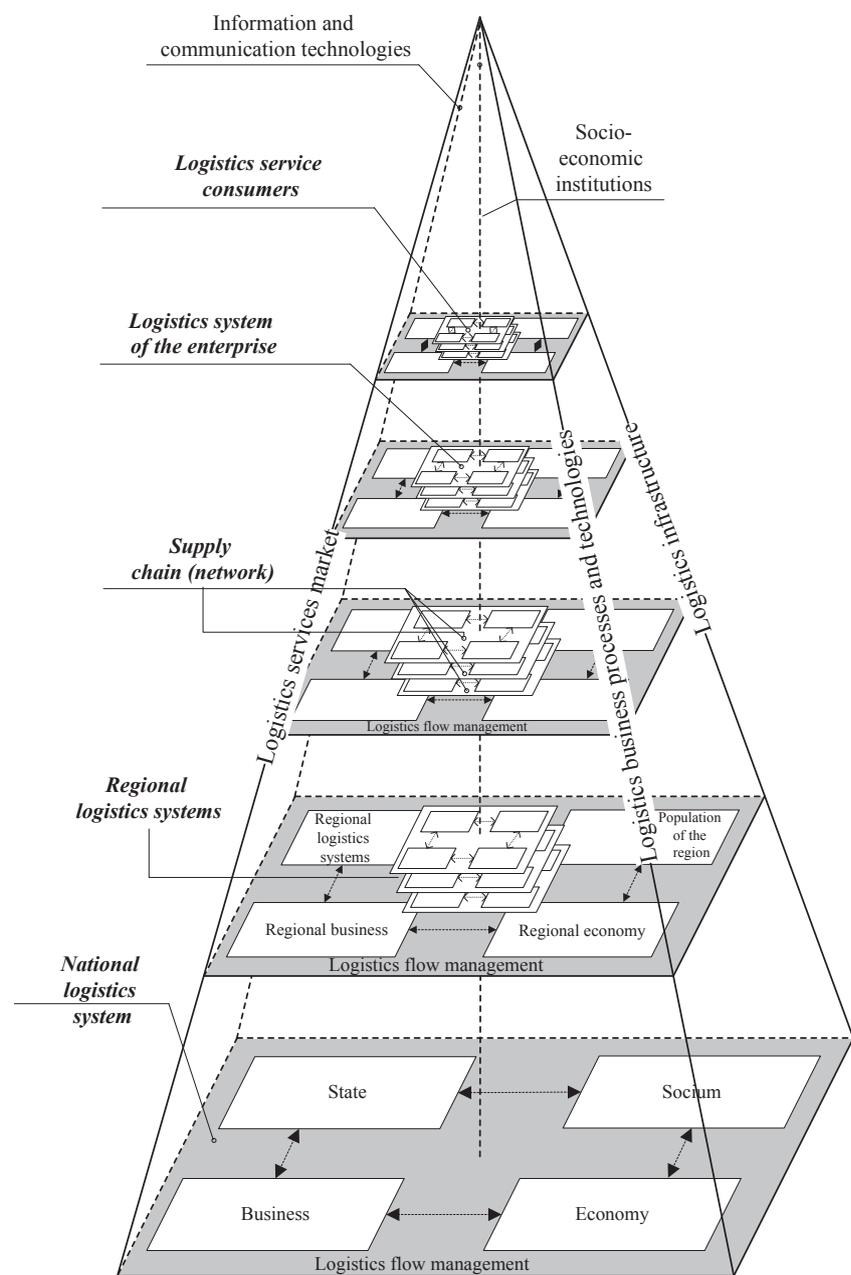


Fig. 1. Multilevel taxonomy of the formation of the national logistics system (compiled by the author on the basis of [17, 18])

Each level of the pyramid means the separation and independent study of the logistics systems of enterprises, the combination of enterprises in the forms of supply chains/networks, clusters, logistics platforms, ecosystems, regional or branch logistics systems, the backbone of which is the logistical flows. The hierarchy of logistics systems by levels of the pyramid is aimed at the formation and development of partnership relations in various channels of interaction in terms of functional or territorial orientation. The organizational form of such economic relations can be functional logistical formations, for which the spatial dispersal of production and labor resources, extraterritoriality and high mobility of means of transport are characteristic [15].

Based on the axiomatics of system economic theory and the tetrad structure of the economic system, let's pay special attention to the formation of the economic environment and the values of the vertical faces of the tetrad. The key category of the illustrated model of the national logistics system is the logistic environment, determined by the structure of the country's logistics infrastructure, the maturity of the logistics services market, the technologies of logistics processes and socio-economic institutions. Together they provide effective interaction of logistical systems of different levels in a common logistic environment, which in turn ensures vertical unity of transformational and transactional processes. The proposed approach to the formation of a national logistics system will facilitate the description and analysis of the influence of macro, meso and micro levels of the economy in the process of their interaction in the management of logistical flows as system-forming factors. Each side of the tetrahedron can be explored separately and through the prism of systemic interaction at the level of the national economy. Inter-layer communication and economic relations determine the specifics of the development of management decisions and regulatory influences. At the same time, the most important interaction between them develops on the periphery of the quadrangle «state – society – economy – business», which, accordingly, determines the development of the market of logistics services in the state. In the example shown in Fig. 1 macro-model, economy as the subsystem should respond to the needs of society and meet the needs of the business. And also provide a wide diversification of jobs and products, ensure the current livelihoods of people, rational use of resources. Social and business partnerships determine the long-term development of the entire «state – society – economy – business» configuration in space and time.

In the conceptual approach to the formation and development of a competitive and efficient national logistics system (NLS), let's proceed from the following provisions:

- in the theoretical and cognitive aspect, NLS is a kind and subsystem of the national economy. NLS is formed through the on-line integration of elements that implement logistic functions. Their quantity and functional content are determined by quantitative and qualitative parameters of logistical flows in space and time;
- in the process of activity of the subjects of the logistics services market, it is necessary to monitor the economic environment. In accordance with the changes that occur in it, it is necessary to predict the consequences of the direct and indirect influence of the set of external and internal factors determining the conditions for the NLS functioning;

- the macroeconomic environment of logistic activity contains natural and climatic, geographic, socio-economic, political and legal and other components that determine the technological features of logistics processes and the criteria for optimizing logistics solutions at the national, regional and local levels;
- structuring of links (subsystems) of NLS as economically separate economic entities is an institutional feature, that is, by economic activities in terms of commodity movement (supply – production – sale – sales);
- macroeconomic environment is determined by the influence of the state, sectoral markets and their mutual influence, the available market and logistics infrastructure;

- economic environment and types of links of the NLS determine the possibility and effectiveness of interaction of all subjects of logistics activities. They allow to adjust the implementation of strategies for production and commercial activities, based on actual results and changes in the external environment, identify and eliminate weaknesses in the management of logistics flows at various levels;

- institutional environment is determined by the legal and organizational design of public relations that determines the emergence of new forms of organization of logistical flows, the regulation of logistics activities, the interaction of participants in the commodity movement. Institutional factors determine the scope of activities of economic entities taking into account the interests of society and create additional opportunities for their effective logistics business in the conditions of economic development. It is through institutional factors that a sustainable, balanced economic growth policy is implemented that allows timely counteracting of negative effects and crisis phenomena;

- information environment and the common information space of the country provide the availability of complete and reliable information for the effective implementation of logistics activities at all levels. Information exchange activates the development of market relations and the functioning of state structures. Due to timely and reliable information, the quality of providing logistic services to the population is growing.

The effectiveness of NLS functioning depends on the stability of the macroeconomic, institutional, market and information environments. It is important that the system for assessing the effectiveness of the logistics activities of various economic agents should be built in such way that the indicators express operational and strategic objectives and have been agreed. This is evidenced by the results of European Commission studies conducted in 2016 to develop a coordinated logistics policy and monitoring the efficiency of the logistics sector in the countries of the European Union [10]. Taking into account the foregoing, a three-level system of key indicators of the effectiveness of logistics activities at macro, meso and micro levels is proposed. At each level, there are indicators that characterize the features of managing the flow processes (Fig. 2).

Thus, the proposed system of indicators of efficiency and effectiveness of logistics activities at different levels should form the basis for the distribution of strategic plans and government programs for the development of the logistics services market, as well as for monitoring its condition and benchmarking. Strategic planning for

development of the logistics sector should solve at least three problems [1, 8, 9]:

- determine national goals, long-term and tactical guidelines, action plans and quantitative objectives for their implementation in this area;
- to be an instrument for coordinating the actions of the executive authorities to introduce various mechanisms to achieve these goals;
- serve as a means of monitoring the implementation of goals and objectives of public policy by civil society, as well as assessing the effectiveness of resource use and the effectiveness of policies in general.

These tasks have made it necessary to improve approaches to justifying target indicators of scientific and technological development of logistics and to find new

methods for financing development programs. All infrastructure projects, technological and managerial innovations should be linked to the expected final results of the NLS development. Changing the components of the environment can reduce the likelihood of the system reaching the settings, which requires the construction of a control system for destabilizing factors and the distribution mechanism for their adaptive control. Fig. 3 presents the author's vision of key drivers of the NLS development.

In the process of analysis, it is necessary to take into account the ultimate goals of public administration, the economic efficiency of the functions of the managing subsystem, the indicators directly and indirectly reflect the development of logistics-intermediary activity through quantitative and qualitative assessments.

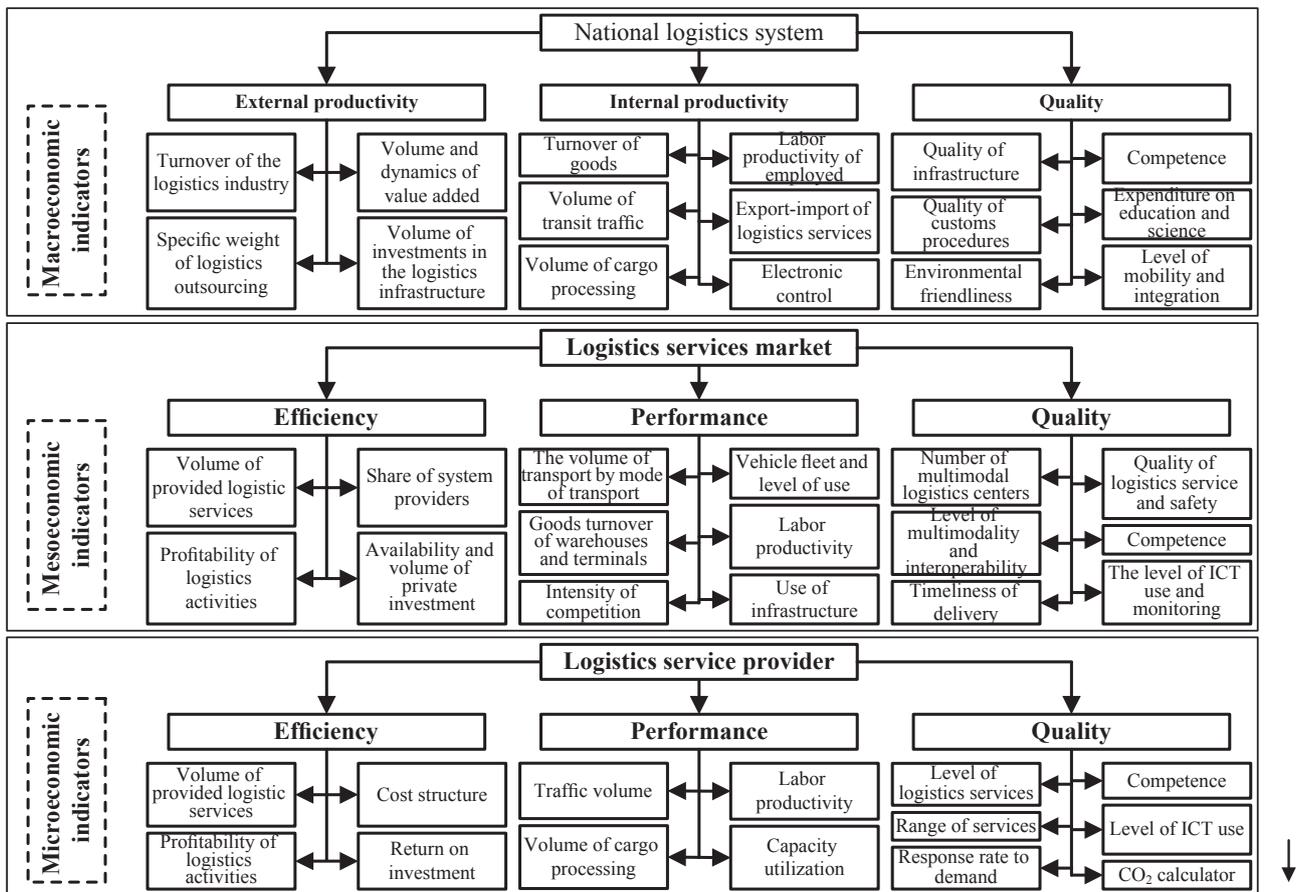


Fig. 2. Key indicators of the effectiveness of logistics activities at the micro, meso and macro levels (author's development)

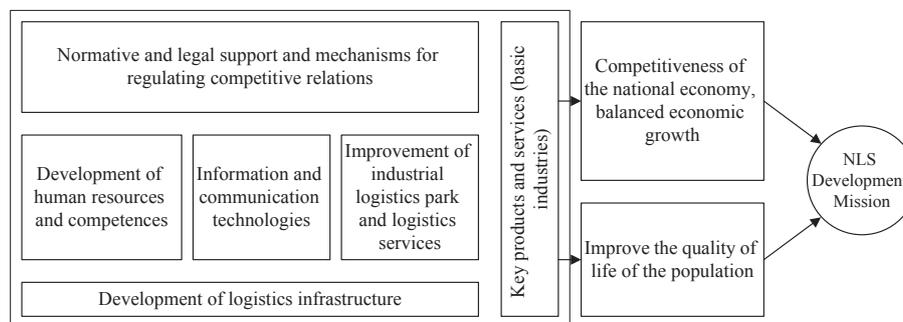


Fig. 3. Development driver of the national logistics system

Along with the economic, it is necessary to take into account social performance indicators that are interrelated and generally act as indicators of the socio-economic effectiveness of the management system.

The state influence on the activity of logistics systems is based on the mechanism for monitoring, analyzing the activities of logistic intermediaries and forecasting, boils down to the use of such methods:

- recommendatory (indicative rules of organization and technology of economic activity, coordination of accounting and analysis of its indicators, other means of scientific and methodological support of the functioning of infrastructure subjects);

- methods of indirect management (economic support of enterprises);
- direct management of individual infrastructure elements as natural monopolies for public procurement.

Effective state regulation assumes the active participation of regional governments in the development of logistics infrastructure and the stimulation of the activities of system logistics providers.

Fig. 4 generalizes factors and levers of state regulation and self-regulation of the market of logistics services, taking into account the priorities of the country's socio-economic development and various levels of government.

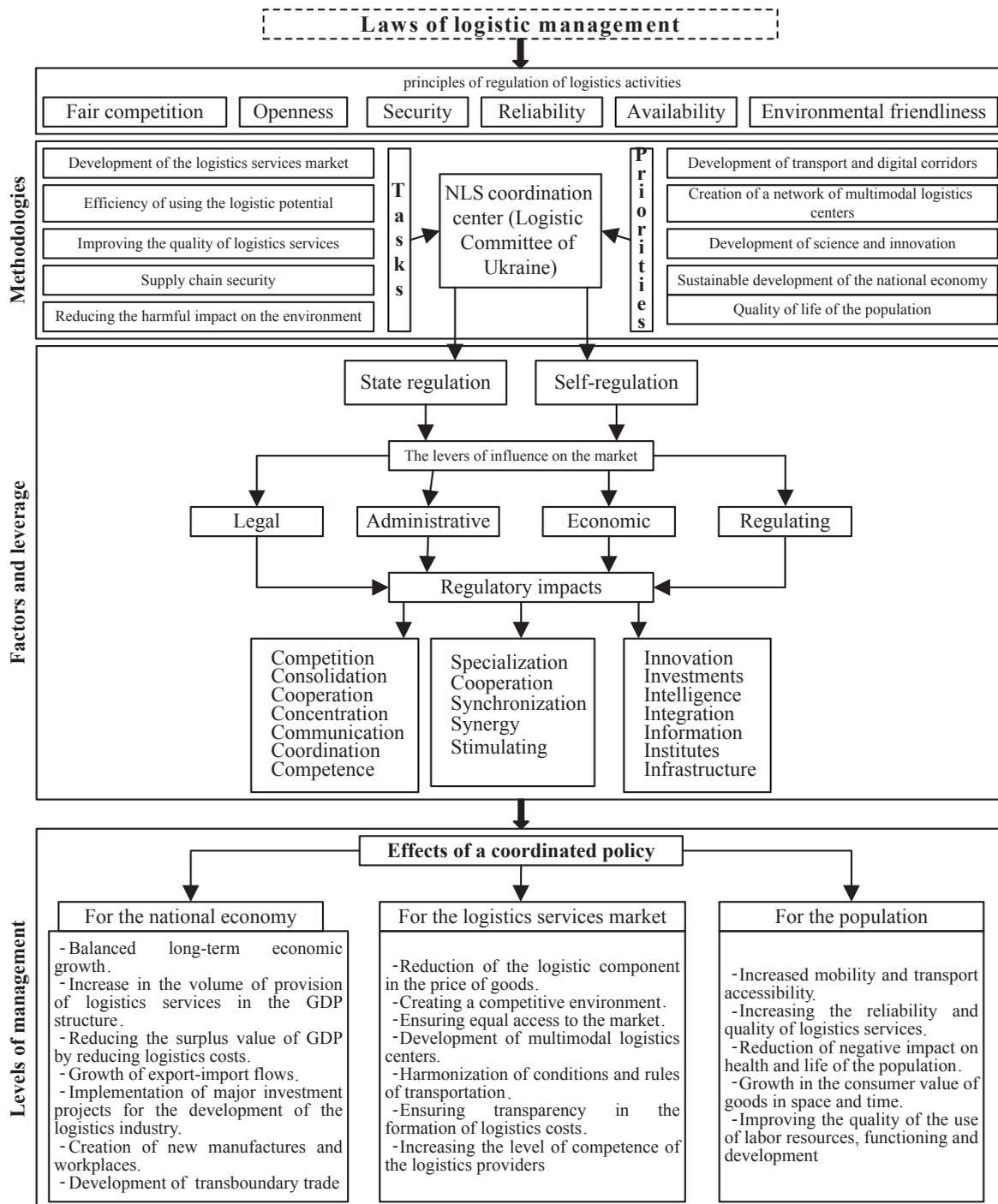


Fig. 4. Regulatory factors and levers of influence on the development of the national logistics system (compiled by the author)

To coordinate managerial decisions regarding the NLS development and the logistics services market, a coordinating center for coordination of logistics should be established in the country to address the issue of reducing the barriers and costs of international trade and internal logistics. These functions can be performed based in 2017 under the Logistics Committee of the Cabinet of Ministers of Ukraine.

Thus, the macroeconomic, institutional and market environments regulated by the state exogenously influence the formation and development of the national logistics system, the realization of the country's logistics potential, the effective activity of the subjects of the market of logistics services. Their activity largely depends not only on the competitiveness of the domestic economy, but also on the essence of integration processes in supply chains/networks, to which Ukrainian enterprises join.

7. SWOT analysis of research results

Strengths. The strength of research is the methodological foundations for the creation of a national logistics system based on theories of multi-level taxonomy and systemic stability of the economy. This makes it possible to build a hierarchy of logistics systems at the micro, meso and macro levels and direct it towards ensuring economic growth and enhancing the competitiveness of the national economy.

Weaknesses. The weak side is that the implementation of the proposed tetrad model requires a large amount of statistical information to build dependencies between the results of logistic activities at different levels of management and the parameters of the flow processes. The processes of interaction are inter-organizational, inter-functional, inter-sectoral, inter-regional, which greatly complicates the practical implementation of the model.

Opportunities. Opportunities for further research is the concretization of socio-economic relations at each level of the hierarchy of management and determining the degree of mutual influence and coherence in the triad «resources (infrastructure) – results (efficiency) – competence (quality)».

Threats. Threats to the results of the conducted research are that the logistics services market is constantly changing, new companies and new infrastructure objects are appearing and the requirements to sustainable development of the national economy are growing. All of this makes it necessary to change the socio-economic institutions and forms and methods of state regulation of logistics activities.

8. Conclusions

1. The theoretical basis and conceptual provisions for the construction of a national logistics system based on theories of multi-level taxonomy and system stability of the national economy are substantiated. This approach allows to harmonize the economic interests of participants in the commodity movement at different levels of management and create the prerequisites for a sustainable development of the logistics services market. Managing logistic flow processes in supply chains/networks, clusters and other organizational forms will help to reduce the total added value in the structure of the national gross product and help to increase the efficiency and competitiveness of the national economy.

2. The structure of the national logistics system is defined in the form of a pyramidal graphic model of the

economy, the basis of which is the national level, and horizontal sections represent regional logistics systems, logistic entities for partner interaction of enterprises and organizations, and also logistical systems of individual enterprises. The borders of the notebook form a space for the logistic activities of various business entities and determine the vertical and horizontal links between the subjects of logistic activity. Management of these links, as well as logistical flow processes at the micro, meso and macro levels will allow to obtain synergy effects and ensure the system stability of the national logistics system. The integrated logistics environment determines the essence and basic mechanisms of state regulation and self-regulation of the market of logistics services in the country.

3. A system of key indicators of the effectiveness of logistics activities at the micro, meso and macro levels of the economic system has been developed, which will enable the collection of statistical data. This system should become the basis for the distribution of strategic plans and government programs for the development of the logistics services market, as well as for its monitoring and benchmarking. Also, the factors and levers of state management of the development of the national logistics system have been identified, which will contribute to the quality improvement of logistics services and the introduction of innovations. In general, the proposed theoretical provisions will contribute to better realization of the powerful logistical potential of Ukraine and the incidence of Ukrainian enterprises to global supply networks.

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РАЗРАБОТКА ТЕОРЕТИЧЕСКИХ ОСНОВ ФОРМИРОВАНИЯ НАЦИОНАЛЬНОЙ ЛОГИСТИЧЕСКОЙ СИСТЕМЫ

Рассмотрено многоуровневую таксономию формирования национальной логистической системы и особенности логистического управления на микро-, мезо- и макроуровнях системы хозяйствования. Определено макроэкономическую средовую структуру и показатели эффективности логистической деятельности по уровням управления. Предложено драйверы и систему регулирующих факторов и рычагов государственного воздействия на развитие национальной логистической системы.

Ключевые слова: логистические потоки, логистическое управление, национальная логистическая система, государственное регулирование логистической деятельности.

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STUDY OF COOPERATION IN AGRIBUSINESS AS A SOCIO-ECONOMIC PHENOMENON

Проведено аналіз наукових методологічних підходів до розуміння сутності кооперації. Подається новий концептуальний підхід до розуміння кооперації, який визначає, що за змістом – кооперація є економічним явищем, а за організаційною формою – кооператив. Обґрунтовано формування і функціонування кооперативу на основі прояву внутрішніх і зовнішніх відносини, носіями і регуляторами яких є кооперативні принципи.

Ключові слова: кооперація в агробізнесі, виробничі відносини, кооперативні принципи, внутрішні і зовнішні відносини.

1. Introduction

Agribusiness covers various spheres and types of activity, operates on a corporate basis with reference to production. This concept should be viewed as the cooperation of a number of industries – agricultural, procurement, sales, processing enterprises, banks and other structures related to the production and sale of technological processes. The peculiarity of this concept is that the final product of one industry is the source for the other and forms the agrarian sector of the economy. Agribusiness is an open, holistic system that consists of structurally-structured elements that are organically interrelated, the functioning of each of which interacts the development of the entire system. Components of agribusiness are: enterprises-producers of means of production, agricultural products and their processing, procuring, storage, sales, agrarian service enterprises, infrastructure enterprises and enterprises of other sectors of the economy.

Before the agrarian sector, which is the main link of agribusiness and the most important component of the Ukrainian economy, there is an urgent task to ensure the country's food security, the welfare of the population, and its political and economic independence. One of the direc-

tions of this task is development of cooperative relations. Cooperation as an organizational form of management and the system of economic relations contributes to the formation of the ideology of protection of rural commodity producers, their involvement in integration processes, which allows taking advantage of large-scale production without additional capital investments. This is an effective, weighty tool in a market economy that ensures the solution of the problem of pricing for agricultural products and determines the organized opposition of the monopoly in overstating the prices of resources for agricultural commodity producer

2. The object of research and its technological audit

The object of research are the processes of development of cooperative relationships in agribusiness, which form the basis of an economic phenomenon, the essence of which is cooperation, as well as the formation and improvement of its organizational and legal forms. Agribusiness is such sphere of entrepreneurial activity, the effective development of which is capable, to a decisive degree, of ensuring the welfare of the population, creating conditions for the