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**THE ECONOMIC SECURITY MECHANISM FOR ORGANIZATIONS
IN MULTIMODAL TRANSPORTATION SYSTEM**

This article describes the features of developing and functioning of economic security mechanism in the system of multimodal cargo transportation, defines its main functional components and directions for its further development.

Economic security in the system of multimodal transportation is defined by the organizations' condition and ability to counteract the internal and external threats and challenges which affect the efficiency of the cargo supply chain.

At the same time it is the organizational-economic mechanism of economic security that sets a sequence of safety procedures and the support of security by means of structural components (special forms, methods and instruments of economic security), that enables stable development of multimodal transport and will ensure balancing of economic interests of delivery participants.

Deployment of this economic security mechanism in the multimodal transport system is ensured through the creation of basis to prevent the loss of time and financial resource, functioning of the reliable information system, effective integration of economic processes and interaction between carriers, customers and other participants of cargo delivery, prompt response to the clients' needs, usage of universal pricing tools and insurance coverage.

Key words: economic security, multimodal transport organizational-economic mechanism, supply chain, efficiency.

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**МЕХАНІЗМ ЕКОНОМІЧНОЇ БЕЗПЕКИ ПІДПРИЄМСТВ
У СИСТЕМІ МУЛЬТИМОДАЛЬНИХ ПЕРЕВЕЗЕНЬ ВАНТАЖІВ**

У статті розглянуто особливості формування та функціонування механізму економічної безпеки підприємств у системі мультимодальних перевезень вантажів, визначені його основні функціональні складові та напрями подальшого розвитку.

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Економічна безпека суб'єктів системи мультимодальних перевезень визначається станом і спроможністю підприємств нейтралізувати та протистояти як внутрішнім, так і зовнішнім загрозам і викликам, що впливають на ефективність ланцюга постачань вантажів.

Водночас, саме організаційно-економічний механізм економічної безпеки встановлює послідовність процедур забезпечення та підтримки такого стану за рахунок структурних складових (спеціальних форм, методів та інструментів економічної безпеки), що сприятиме сталому розвитку мультимодальних перевезень і забезпечить збалансування економічних інтересів учасників доставки.

Реалізація механізму економічної безпеки підприємств у системі мультимодальних перевезень забезпечується шляхом створення засад для запобігання загроз втрати часових і фінансових ресурсів, функціонування надійної інформаційної системи, ефективної інтеграції економічних процесів та взаємодії перевізників, клієнтів та інших учасників доставки вантажі, швидкого реагування на потреби клієнтів, використання гнучких інструментів ціноутворення та страхового захисту.

Ключові слова: економічна безпека, мультимодальні перевезення, організаційно-економічний механізм, ланцюг постачань, ефективність.

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МЕХАНИЗМ ЭКОНОМИЧЕСКОЙ БЕЗОПАСНОСТИ ПРЕДПРИЯТИЙ В СИСТЕМЕ МУЛЬТИМОДАЛЬНЫХ ПЕРЕВОЗОК ГРУЗОВ

В статье рассмотрены особенности формирования и функционирования механизма экономической безопасности предприятий в системе мультимодальных перевозок грузов, определены его основные функциональные составляющие и направления дальнейшего развития.

Экономическая безопасность участников системы мультимодальных перевозок определяется состоянием и способностью предприятий нейтрализовать и противостоять как внутренним, так и внешним угрозам и вызовам, которые влияют на эффективность цепи поставок грузов.

В то же время, именно организационно-экономический механизм экономической безопасности устанавливает последовательность процедур обеспечения и поддержки такого состояния за счет структурных составляющих (специальных форм, методов и инструментов экономической безопасности), что будет способствовать устойчивому развитию мультимодальных перевозок и обеспечит сбалансирование экономических интересов участников доставки.

Реализация механизма экономической безопасности предприятий в системе мультимодальных перевозок обеспечивается путем создания основ для предотвращения угроз потери временных и финансовых ресурсов, функционирования надежной информационной системы, эффективной интеграции экономиче-

ских процессов и взаимодействия перевозчиков, клиентов и других участников доставки грузов, быстрого реагирования на потребности клиентов, использовании гибких инструментов ценообразования и страховой защиты.

Ключевые слова: экономическая безопасность, мультимодальные перевозки, организационно-экономический механизм, цепь поставок, эффективность.

Definition of the problem. Improvement of effectiveness and quality of transportation services is one of the most important trends of development for economic sector in any country and its business entities. Concurrently the interaction between different types of transport during the cargo delivery serves as a factor that ensures the continuity of transportation process, accelerates transportation and provision of related services, as well as ensures the synergetic effect which in total is based on the combination of benefits of one or another carrier at any part of supply chain. At the same time this interaction is possible due to the well-tuned mechanism of economic security for all participants of transportation process, and the emerging role of its informational constituent, harmonization of legal and regulatory framework of different carriers, as well as due to the standards in the sphere of transport service delivery within the territory of the member states. Functioning and development of this mechanism are of academic and practical interest.

Analysis of recent researches and publications. The analysis of up-to-date theoretical and practical principles of multimodal transport functioning I presented in the works of several researchers, including A. Braikovska, V. Pasichnik, P. Pidlisnyi, O. Sokolova, L. Sulima, V. Chorny et al. [2, 5, 6, 9, 12, etc.]. Though despite the results, achieved in the economics of combined transport, the matter and the content of the mechanism of economic security for multimodal transport are still not discovered, and there is no systematic research of the principles of multimodal transport development, that will contribute to the mitigation of risks in transportation and arrangement of interaction between the participants of the cargo delivery process at the current stage of the reforming of national transport sector.

The purpose of this article is to research and to specify the reasoning for the basic principles of formation of economic security mechanism in the system of multimodal delivery.

Presentation of basic materials. Reasoning of the structure of the economic security mechanism depends on the purposes and challenges of safe development of economic entity. At the same time in the structure of economic security mechanism the researchers [1, 3, 4 and others] typically define either step-by-step approach in the realization of control procedures for economic security or the complex of measures aimed for minimizing of possible risks by means of consolidating of forms, methods, principles, functions and tools for economic security management. The current research supports the second method of presenting the economic security mechanism, because it is functional tools that should be used to implement the following step-by-step strategy of economic security guarantee.

Modern trends in the development of cooperation between the participants of transporting in the supply chain are directed towards the implementation of the procedures of international trade and logistics facilitation, arrangement of efficient multimodal transportations. The special aspects of the last ones include the availability of the unified responsible transport operator with the interaction of several transportation means, creation of preconditions that allow usage of the consolidated transporting document, through tariff

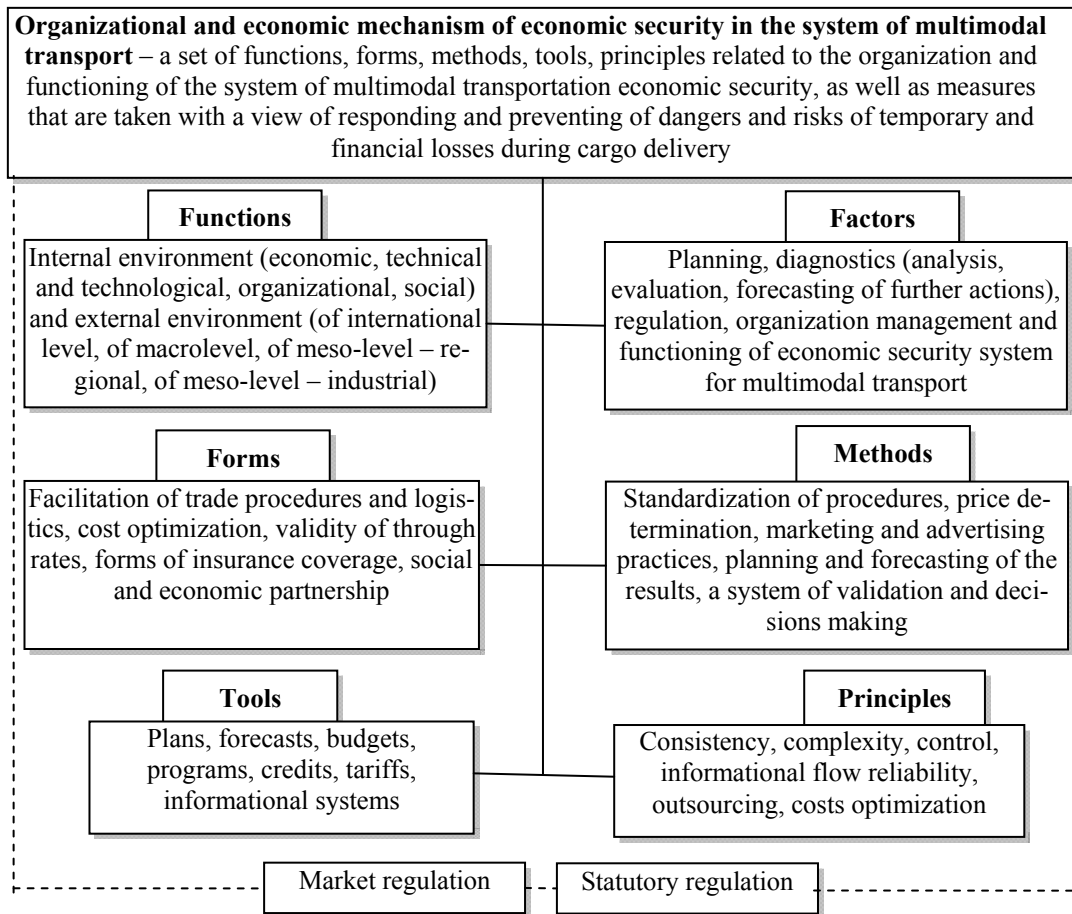
rates, implementation of modern systems of informational support and transport process coordination.

Structure of cargo supply chain is a the main factor that defines and forms the specificities of the mechanism that ensures economic security of the enterprises, while the research of its operations and strengthening of the integration between its separate links will promote possible threats prevention, arrangement of preventive measures, improvement of the economic security system for transport organizations etc., while the the specific features of the complex cargo transition process through multimodal connection will have a dominative influence. At the same time risk monitoring as an integral tool of economic security mechanism in the supply chains used in the multimodal transportations, ensures a system and consistent analysis of the situation and controls the state of economic security during the process of cargo carriage.

Besides, any supply chain in the multimodal transport process can't be featured as a steady productive-economic process, as far as it is developed based on the requirements to the economic security guarantee that can vary depending on the participants of every single cargo carriage, which means that it should be researched contextually and be oriented on perspective directions of transport sector development.

The mechanism of economic security for supply chains in multimodal transport system represents a structural framework (a complex of principles, forms, methods, tools etc.), which are combined on a consistent basis and consequently used for development a direct principle of functioning for multimodal transport system (see *Picture 1*). At the same time this «procedure» is characterized by an interconnected cumulative actions regulated by definite rules, standards, which along with the centralized management and responsibility of multimodal operator ensures economic safety of the complex process of cargo delivery.

The special aspects of formation of economic security mechanism for supply chains depend on the wide range of factors, which are the baseline of every organization and such transportations, and influence the arrangement of cargo handling procedures. These special aspects can be divided into interrelated groups that first of all depend on the processes of cargo handling by different transportation means that are involved in the elements of the formed supply chain, according to the requirements of some specific multimodal cargo transportation; and secondly on the performing of procedures of multimodal transportation organized by multimodal transport operator, providing its complexity and consistency (integrity).



Picture 1. Structure of economic security mechanism for enterprises involved in the multimodal transport system

Functioning of the economic security mechanism for enterprises involved in the multimodal transportations depends on compliance of the provisions of international agreements and conventions that set the legal norms of functioning for different transportation means. This way, for example, Agreement on International Goods Transport by Rail [8] contains the regulations concerning railways liabilities for the cargo, norms regulating the claims as for the quality of freight transportation, financial matters as for payments settlement with railways, etc. These specified peculiarities of railway cargo transportation are the elements of mechanism of economic security for supply chains within railways freight transportation. The same regulations are included into the international agreements that regulate freight transition by automobile, water and air transport. While the economic security mechanism should promote seamless and consistent combination of procedures of functioning of separate subsystems that ensure economic safety of supply chains, if the cargo is transported by different transportation means, combined in the supply chain, including those of them that are performed by logistic centers.

This way, we can define the following features as the special aspects of economic security mechanism's operation in the supply chain within multimodal transportations,

namely: the presence of numerous elements in the supply chain (especially if cargo delivery is performed by different carriers that represent different transportation means); need in creation and development of modern logistic centers with infrastructure and location on the way of freight transportation which ensure transshipment of cargo and performance different state cargo inspections during its importing/exporting into/from the country territory; transfer of the responsibility by multimodal transport operator to carriers and logistic centers operators on specific stages of supply chain for ensuring of economic security of supply chains during multimodal freight transport, etc.

Important components of the mechanism are the security assurance requirements and its principles. This way, economic security principles, including complexity, consistency, standardization, integration, outsourcing, cost optimization etc. define the basic rules-guidelines for organization of cargo transfer processes by supply chains during multimodal transport, and create a background for economic safety of the enterprises. At the same time the prerequisites for economic security assurance make up the sources for economically profitable cargo transition through supply chains in multimodal transport system. The economic security mechanism determines specific plan of action, which makes it possible to define the current state of metrics – indicators of economic security and ensure applying of additional measures of economic security, which have to be defined in case of any deviation of indicators' values from the maximum permissible level.

Considering the freight transition by supply chains within multimodal transport operations as a unique and time-limited process, the main requirements to the economic security mechanism are: possibility for identification of economic security threats; analysis of the impact of potential and present threats for economic security; determination of adequate measures to ensure economic security according to the identified dangers; identification of preventive measures to neutralize the influence of potential threats, etc.

Mechanism that ensures economic security of supply chains in multimodal freight transport should ensure feedback functioning. This feedback will ensure objective assessment of current state and monitoring of economic security in enterprises, definition of situational complex of measures to ensure economic security at all elements of supply chain. Information concerning the current state of economic security should enter during the whole process of freight transition process from all stages of supply chains, and in case any threat's effect is identified the appropriate measures should be taken to neutralize that influence on economic feasibility of multimodal transport.

Taking the above mentioned into consideration, the economic security mechanism in the multimodal transport system provides a system of organizational and economic measures to multimodal transport operator, who creates the stages of supply chain, which are formed based on the specified laws regulating the multimodal transport process, and are referred to prevention and mitigation of threats in the internal and external environments. While the complex of institutional arrangements consists of planning and developing of two interdependent and interrelated flows: material and informational. Material flow (freight transition) is set up of the supply chain links, when the cargo delivery is performed by different transportation means and logistic centers. Besides the following are also taken into account: transportation route, its length, the type of cargo and its properties, the availability of private transportation means and possibility to engage transport from the external organizations, formed tariff policy for different transportation means on the transport route, availability and branching of logistic centers, etc.

Economic measures presupposed by the mechanism of economic security of supply chains in multimodal transport are interrelated mostly with the processes of price deter-

mination and insurance protection. Optimality of through fare for freight transportation in the supply chains during multimodal transport depends on selection of the most economically feasible transportation means at particular link of supply chain, which is always related to the transportation route and its peculiar features. Meanwhile logistic centers perform the procedures of transportation means change, being a linking elements for all the supply chain links in the system of multimodal transportations.

Economic measures guaranteeing the economic security in logistic centers should be based on organizational and infrastructural elements within logistic centers and provide the solutions for the following tasks: maintenance of state control while importing of the goods being transported for the defined period based on the data that should enter in digital format to the «single window» system; transshipment of cargo from one transportation means to another during the fixed time period by means of available corresponding infrastructure that ensures arrival of different transport modes and necessary specialized mechanisms for loading and unloading operations; preservation of cargo in case it is necessary to accumulate a sufficient batch volume; to ensure costs minimization, that are related with the procedures of transportation means changing; minimization of time and financial expenses for customs clearance and cargo execution at the beginning of transportation, borders crossing and final stage of international cargo transportation.

Multimodal transportations will make it possible to decrease financial expenses for multimodal transporting operators through the prevention of excessive payments to all participants of transportation process that may incur in logistic centers during the transport mode changing and while providing state control for the goods transported.

Some operating parameters of the mechanism are subject to direct or indirect economic assessment. This way we can define the following quantitative indicators that qualify the functioning of the mechanism of economic security in supply chains within multimodal transport system: multimodal transport operator's revenue resulting from cargo transition through the whole transportation route; general expenses for arrangement and performing of cargo transition by different transportation means; estimated and actual time needed for cargo transition, etc. While the qualitative indicators include the return on investment made to multimodal transportations, and ratio of declared time period for goods transportation and the actual time. Besides one of the important features of the mechanism is a cargo turn-around rate for the defined period (for example, for 24 hours) per one logistic center, which is calculated as a ratio of the cargo unloaded and loaded from transportation modes, and as an average cargo turn-around rate for the whole supply chain within multimodal transportation process.

There is also one of the mechanism's component that should be stated separately, namely the technologies used in the multimodal transportation processes. The basics of technological procedures related to the cargo carriage by different transportation means are defined by the provisions of some international agreements and conventions, although the development of the supply chain links during multimodal transportations also needs the development of new technologies for logistic centers operation, that will be able to combine the separate links of supply chain and ensure economic security of the processes within multimodal transportations. These technologies that enable logistic centers operation, being a complex and sequence of processes needed during transportation mode changing, should guarantee the combining of processes related to the cargo and information, while multimodal transport operator should have a real-time feedback communication to be informed about the operations of logistic centers. Such a feedback communication allows multimodal transport operators take operational and preventive measures to

make adjustments to technological processes, which are the component elements of the economic security mechanism during transport mode change.

Conclusions and propositions. This way it should be specified that the economic security mechanism used in supply chains within multimodal cargo transition features a set of purposeful actions under defined rules, requirements and regulations related to the operations of organizations in the multimodal transport system, that provide its efficient development. This mechanism depends on internal and external factors that impact economic security and its principles, provide preconditions to ensure economic security and the special features of economic security mechanism development for supply chains in multimodal transportation system. There are good reasons to reveal the essence and content of the efficiency of the specified mechanism as well as the methods of its evaluation during the upcoming researches.

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