

UDC 339.5:368:006

JEL Classification: G22, F10, F13

DOI: <https://doi.org/10.20535/2307-5651.36.2026.360540>**Moiseienko Tetiana**

PhD in Economics, Associate Professor,
Associate Professor of the Department of International Economics
(corresponding author)
ORCID ID: 0000-0002-2074-8062

Korohodova Olena

PhD in Economics, Associate Professor,
Associate Professor of the Department of International Economics
ORCID ID: 0000-0003-2338-365X

Chernenko Natalya

PhD in Economics, Associate Professor,
Associate Professor of the Department of International Economics
ORCID ID: 0000-0002-7424-7829

Hlushchenko Yaroslava

PhD in Economics, Associate Professor,
Associate Professor of the Department of International Economics
ORCID ID: 0000-0003-1454-0369
National Technical University of Ukraine
“Igor Sikorsky Kyiv Polytechnic Institute”

INSURANCE OF FOREIGN TRADE RISKS IN GLOBAL SUPPLY CHAINS: THE ROLE OF INTERNATIONAL STANDARDS

The growing complexity of global supply chains and increasing economic uncertainty have significantly intensified risks in international trade, which makes the development of effective risk management instruments particularly relevant. The purpose of this article is to examine the role of insurance in mitigating foreign trade risks and to assess the importance of international standards in ensuring the stability and predictability of cross-border trade operations. The research is based on a systematic and structural analysis of foreign trade risks within global supply chains, combined with a formalized approach to risk aggregation and insurance impact assessment. Integrated risk evaluation models and conceptual indicators of insurance standardization are applied to assess the aggregated impact of different risk categories and the mitigating effect of insurance instruments, following established approaches in international risk management and insurance economics. The results of the study demonstrate that insurance serves as a crucial tool for risk redistribution and financial protection in international trade, particularly under conditions of political, logistical, financial, and operational uncertainty. It is established that international standards play a decisive role in coordinating trade and insurance relations and enhancing overall risk management efficiency. The practical value of the article lies in its applicability for international traders, insurers, and policymakers when designing insurance schemes and improving risk management practices in global supply chains.

Keywords: international trade, insurance, foreign trade risks, global supply chains, international standards, Incoterms, risk management, EU Standards and Economic Policy.

**Моїсеєнко Т. Є., Корогодова О. О.,
Черненко Н. О., Глущенко Я. І.**

Національний технічний університет України
«Київський політехнічний інститут імені Ігоря Сікорського»

СТРАХУВАННЯ ЗОВНІШНЬТОРГОВЕЛЬНИХ РИЗИКІВ У ГЛОБАЛЬНИХ ЛАНЦЮГАХ ПОСТАВОК: РОЛЬ МІЖНАРОДНИХ СТАНДАРТІВ

Зростаюча складність глобальних ланцюгів постачання та зростання економічної невизначеності значно посилили ризики в міжнародній торгівлі, що актуалізувало розробку ефективних інструментів управління ризиками. Метою цієї статті є дослідження ролі страхування у нівелюванні ризиків міжнародної торгівлі та оцінка важливості міжнародних стандартів у забезпеченні стабільності та передбачуваності транскордонних торговельних операцій. Дослідження базується на систематичному та структурному аналізі ризиків зовнішньої торгівлі в рамках глобальних ланцюгів постачання, поєднаному з формалізованим підходом до агрегації ризиків та оцінки впливу страхування. Інтегровані моделі оцінки ризиків та концептуальні показники стандартизації страхування застосовуються для оцінки сукупного впливу різних категорій ризиків та пом'якшувального ефекту страхових інструментів, дотримуючись ustalених підходів у міжнародному управлінні ризиками та економіці страхування. Результати дослідження демонструють, що страхування служить вирішальним інструментом для перерозподілу ризиків та фінансового захисту в міжнародній торгівлі, особливо в умовах політичної, логістичної,



фінансової та операційної невизначеності. Встановлено, що міжнародні стандарти відіграють вирішальну роль у координації торговельних та страхових відносин та підвищенні загальної ефективності управління ризиками. Практична цінність дослідження полягає в можливості застосування для міжнародних трейдерів, страховиків та політиків під час розробки страхових схем та вдосконалення практики управління ризиками в глобальних ланцюгах постачання.

Ключові слова: міжнародна торгівля, страхування, ризики зовнішньої торгівлі, глобальні ланцюги постачання, міжнародні стандарти, Інкотермс, управління ризиками, економічна політика та стандарти ЄС.

Problem statement. Modern international trade operates under conditions of increasing geoeconomic instability, transformation of global supply chains, and heightened uncertainty. The growing complexity of international trade relationships, expansion of operational geography, and involvement of numerous participants from different jurisdictions contribute to an increase in foreign trade risks, which can have significant financial consequences for entities engaged in international economic activities.

Under these circumstances, there is a growing need not only for qualitative identification of foreign trade risks but also for their quantitative assessment, which allows formalizing the impact of different groups of risks on the outcomes of international trade activities. The use of integrated risk indicators and models for assessing the insurance effect provides a methodological basis for the justified application of insurance as a risk management tool in global supply chains.

In the context of global supply chains, traditional approaches to international trade risk management prove to be insufficient. The insurance of foreign trade risks becomes particularly relevant as a mechanism to ensure the stability and continuity of international trade operations. At the same time, the effectiveness of insurance mechanisms largely depends on their alignment with international standards that regulate the conditions for conducting foreign trade operations, as well as the allocation of risks and responsibilities between parties.

Analysis of recent research and publications. The issue of risk management in international trade and global supply chains is widely represented in the works of both foreign and domestic scholars. In particular, M. Christopher emphasizes the systemic nature of risks in global supply chains and their interrelation with logistics infrastructure and the organization of product flows [1]. K. S. Tang examines the classification and propagation mechanisms of risks in supply chains, highlighting their cascading effect and the necessity of integrated risk management [2]. Considerable attention to the resilience and transformation of global supply chains under external shocks is devoted in OECD reports, where risks are considered a key factor in the rebalancing of international trade [4].

The role of insurance in mitigating financial losses from risky events in international trade is thoroughly discussed in the works of G. Skipper and W. Kwon, as well as J. Reade and M. McNamara, who consider insurance as a fundamental instrument of risk management and financial stabilization of foreign trade operations [7; 8]. Certain studies by international organizations focus on the analysis of political and regulatory risks, as well as the role of international standards in creating a transparent and predictable environment for international trade [6; 9]. It is also advisable to consider the EU's approach to institutional transparency and standardisation as instruments of risk management. As noted by A. Marx and G. Van der Loo, "transparency has become a core principle of EU trade

policy aimed at increasing predictability and trust for economic operators," which directly reduces regulatory and information risks in international trade [10]. At the same time, the European Commission emphasises that European standards provide a common technical language and ensure transparency, interoperability and legal certainty for businesses operating in the Single Market and beyond, thereby shaping a stable and predictable environment for participants in global supply chains [11].

At the same time, despite a significant body of scholarly work, the issues concerning the interrelation between insurance mechanisms and international standards regulating foreign trade operations remain insufficiently systematized. Furthermore, formalized approaches to evaluating the effectiveness of insurance in the context of global supply chains are lacking, which underlines the relevance of the present study.

Formulating the purposes of the article. The purpose of this article is to examine the role of international standards in the development and functioning of insurance mechanisms for foreign trade risks within global supply chains.

To achieve this objective, the study aims to: summarize approaches to the identification and classification of foreign trade risks; propose formalized methods for assessing risk levels and the insurance effect; analyze insurance as a tool for managing international trade risks; and determine the role of international standards in ensuring the effectiveness of insurance for foreign trade operations.

Presentation of the main research material. Modern international trade increasingly operates within global supply chains (GSCs), which unite manufacturers, suppliers, logistics operators, financial and insurance institutions from different countries. Such a multi-tiered structure enhances the efficiency of international exchange but significantly complicates the system of risks inherent in foreign trade operations.

Foreign trade risks in global supply chains are complex in nature and arise at various stages of the movement of goods, capital, and information. Unlike traditional bilateral export-import transactions, in GSCs, risks encompass the entire network of participants in the chain, which amplifies interdependence and vulnerability effects.

In the academic literature, there is no single universal classification of foreign trade risks; however, in the context of global supply chains, it is reasonable to distinguish the main groups of risks (Table 1).

To generalize the impact of different groups of foreign trade risks in global supply chains, it is reasonable to apply an integrated risk assessment:

$$R_{FT} = \sum_{i=1}^n \omega_i \cdot r_i \quad (1)$$

where R_{FT} – is the integrated level of foreign trade risk;

ω_i – individual type of risk;

r_i – weighting coefficient of the corresponding risk,

$\sum \omega_i = 1$.

Table 1

Classification of Foreign Trade Risks in Global Supply Chains

Risk Group	Name	Description and Key Manifestations	Features in Global Supply Chains
Commercial risks	Commercial risks	Non-performance or improper performance of contractual obligations by counterparties; insolvency or bankruptcy of the buyer; payment delays; violation of delivery terms and product quality standards.	Extend across multiple links of the supply chain; may cause financial losses not only for exporters but also for logistics and financial intermediaries.
Political risks	Political risks	Trade restrictions and sanctions; currency regulations; nationalization or expropriation of assets; armed conflicts; political instability.	Occur not only in exporting or importing countries but also in transit countries; have a systemic nature and are difficult to predict.
Logistics risks	Logistics and transportation risks	Loss, damage, or delay of cargo; disruption of transport infrastructure; operational failures of logistics providers.	Amplified in multimodal transportation and complex routes; can cause cascading delays throughout the supply chain.
Financial risks	Financial risks	Currency risks; interest rate risks; liquidity risks; risks related to the use of trade finance instruments.	Closely integrated with trade finance mechanisms; affect the solvency of participants in foreign trade operations.
Operational and systemic risks	Operational and systemic risks	Failures in information systems; cyberattacks; breakdowns in coordination between supply chain participants.	Characterized by rapid propagation; capable of paralyzing the functioning of significant parts of the global supply chain.

Source: developed by the authors based on [1; 6–9; 11–15]

The proposed approach to integrated assessment of foreign trade risk corresponds to the logic of aggregating multi-component risks commonly accepted in international economic literature and applied in studies on risk management in international trade and global supply chains. The use of weighting coefficients allows accounting for the unequal significance of individual risk groups depending on the specifics of the product, market, and supply chain structure. Similar approaches are widely used in research on supply chain risk management and the economic consequences of disruptions in global supply chains [2; 4; 12].

A characteristic feature of foreign trade risks in global supply chains is the cascading effect of risks, where the realization of one risk may trigger secondary risks at other stages of the chain.

As global supply chains grow more complex, insurance of foreign trade risks becomes a key tool to ensure the stability of international trade. It enables risk redistribution among market participants, reduces financial losses, and increases the predictability of foreign trade operations.

The financial consequences of risk events within an insurance framework can be formalized using the expected loss indicator:

$$EL = \sum_{j=1}^m P_j \cdot L_j \quad (2)$$

where EL – expected insurance losses; P_j – probability of the insured event; L_j – magnitude of financial losses.

The use of expected loss as an indicator is a fundamental tool in the economic analysis of insurance operations and is widely applied in insurance theory and risk management. In the context of international trade, this model allows for a quantitative assessment of potential financial consequences of foreign trade risks and substantiates the feasibility of insurance coverage considering the probability of risk events. This approach underlies the calculation of insurance premiums and is used both in commercial insurance and in export credit insurance systems [7; 8].

Within the risk management concept, insurance is considered a risk transfer instrument, the effectiveness of which can be expressed as a reduction in overall risk:

$$\Delta R = R_0 - R_1 \quad (3)$$

where R_0 – risk level without insurance coverage; R_1 – risk level after applying insurance.

The proposed risk reduction indicator allows insurance to be viewed not only as a mechanism for financial compensation but also as an active risk management tool. In international trade, particularly within global supply chains, the effect of insurance manifests in reduced uncertainty, stabilization of cash flows, and increased resilience of trade operations to external shocks. A similar approach to evaluating insurance effectiveness is used in studies on the role of insurance in international economics and financial stability [1; 7].

In practice, international trade applies a range of specialized insurance types, each aimed at covering specific groups of foreign trade risks (Table 2).

The institutional role of international standards in the system of foreign trade risk insurance within global supply chains is summarized in Figure 1, which illustrates the sequential cause-and-effect relationship between the functioning of global supply chains, the formation of foreign trade risks, and the mechanisms for their insurance coverage.

According to Figure 1, global supply chains serve as the environment in which foreign trade risks arise, encompassing commercial, logistics, financial, and political aspects of international exchange. As the complexity and interdependence of such risks increase, international standards assume the role of a key institutional element that ensures the unification of approaches to risk identification, allocation, and insurance coverage.

Structurally, the diagram reflects three interrelated groups of international standards: trade standards, represented by Incoterms rules, which determine the moment of risk and cost transfer between the parties to a contract; insurance standards, which regulate approaches to risk assessment and the formation of insurance coverage; and regulatory standards, aimed at ensuring transparency, consistency, and stability in the functioning of insurance markets. The interaction of these standards forms the basis for the development of unified insurance approaches within global supply chains.

Table 2

Major Types of Insurance in International Trade and Corresponding Risk Groups

Type of Insurance	Name	Covered Risks	Application in International Trade	Link to International Standards
Cargo insurance	Cargo insurance	Loss, damage, or destruction of cargo; delivery delays; transportation incidents	International transport using various modes, including multimodal transportation	Determined by Incoterms, which regulate the point of risk transfer between contracting parties
Export credit insurance	Export credit insurance	Commercial non-payment risks; political risks; risk of foreign buyer bankruptcy	Export operations with deferred payment; trade with new or high-risk markets	Aligned with international insurance principles and trade finance mechanisms
Political risk insurance	Political risk insurance	Sanctions; currency restrictions; nationalization; expropriation; armed conflict	Long-term international trade and investment operations	Based on international standards and regulatory principles of insurance markets

Source: developed by the authors based on [5; 6; 7; 8; 9].

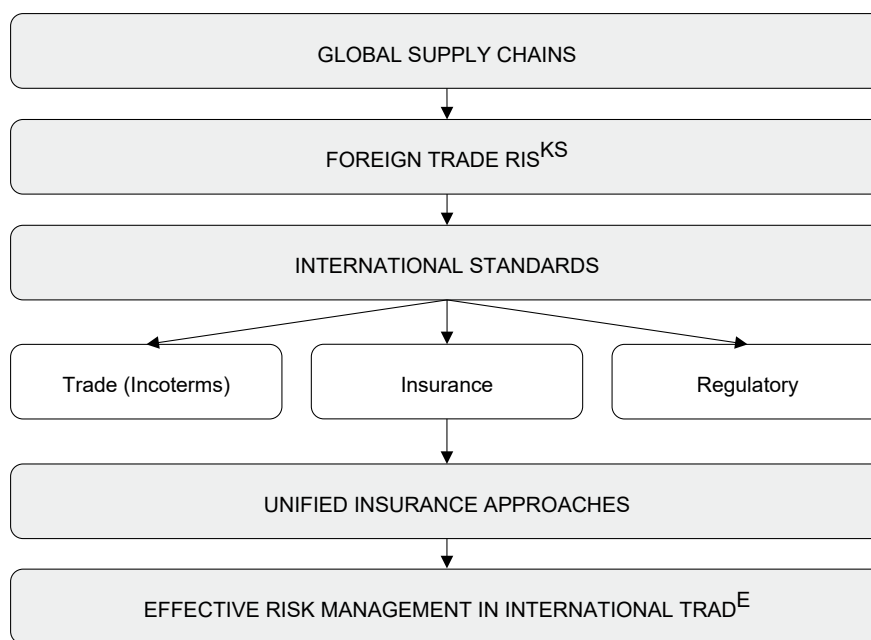


Figure 1. The role of international standards in shaping foreign trade risk insurance mechanisms within global supply chains

Source: developed by the authors

The overall effect of international standards is an enhancement of foreign trade risk management efficiency, manifested in the reduction of uncertainty, optimization of responsibility allocation among international trade participants, and assurance of predictable insurance protection. Thus, Figure 1 illustrates the system-forming role of international standards in the architecture of international trade risk management.

One of the key international standards directly affecting the insurance of foreign trade operations is the Incoterms rules of the International Chamber of Commerce, which define the moment when the risk of loss or damage to goods passes from the seller to the buyer, as well as the allocation of costs between the contracting parties, which is fundamental for the formation of insurance coverage [5].

For a generalized assessment of the role of international standards in foreign trade risk insurance, it is reasonable to use the Insurance Standardization Index:

$$SI = \frac{S_t + S_i + S_r}{3} \tag{4}$$

where SI – insurance standardization index; S_t – level of application of trade standards; S_i – level of application of trade standards; S_r – level of regulatory harmonization.

The proposed insurance standardization index is conceptual in nature and aims to provide a generalized assessment of the degree of alignment of insurance mechanisms with international standards in global supply chains. Similar indicative approaches are applied in analytical reports of international organizations to evaluate the institutional environment of international trade and financial markets. In the context of this study, the index allows linking trade standards (Incoterms), insurance principles, and regulatory harmonization into a single analytical framework, which is important for further empirical research [3; 6; 9].

Conclusions. The study shows that the increasing complexity of global supply chains leads to a higher level of foreign trade risks and requires the application of comprehensive risk management tools that combine qualitative risk identification with quantitative assessment. The proposed integrated risk indicators, expected loss assessment model, insurance effect indicator, and insurance standardization index are consistent with contemporary approaches to international trade risk analysis and complement existing theoretical frameworks in supply chain risk management.

It has been demonstrated that international standards play a decisive role in enhancing the effectiveness of foreign trade risk insurance, ensuring the unification of

approaches to risk and responsibility allocation among international trade participants. Future research should focus on the empirical testing of the proposed models and

the analysis of the adaptation of international standards to the conditions of digitalization and transformation of global supply chains.

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Дата надходження статті: 06.03.2026

Дата прийняття статті: 27.03.2026

Дата публікації статті: 02.06.2026