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**Інтеграція ризик-орієнтованого та кризового менеджменту в управлінні
зовнішньоекономічною діяльністю**

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Анотація: Мета дослідження полягає у теоретичному та прикладному обґрунтуванні інтегрованої системи ризик-орієнтованого та кризового менеджменту у сфері зовнішньоекономічної діяльності підприємства. Доведено, що в умовах війни, волатильності валютних ринків та нестабільності логістичних ланцюгів саме інтеграція ризик-менеджменту та кризового менеджменту дає змогу формувати стійке безпечове середовище та знижувати ймовірність стратегічних помилок. Підкреслено, що традиційні статичні підходи до управління ризиками у ЗЕД є недостатньо ефективними, оскільки не враховують динамічний характер сучасних криз, необхідність сценарного прогнозування та використання тригерів для раннього попередження.

Методи дослідження ґрунтуються на систематизації наукових і прикладних підходів, критичному аналізі практичних кейсів, виокремленні ключових чинників впливу та використанні методу аналізу ієрархій (АНР), який дозволяє конвертувати якісні судження у кількісні пріоритети, інтегрувати їх у сценарний аналіз та розраховувати інтегральний індекс загрози для кожного сценарію.

Результати дослідження представлено у вигляді трирівневої моделі ризик-орієнтованого кризового менеджменту у зовнішньоекономічній діяльності підприємства, що охоплює ідентифікацію та пріоритезацію ризиків, сценарне прогнозування кризових ситуацій і побудову системи раннього попередження. Запропонована модель дає змогу своєчасно відслідковувати «слабкі сигнали» у зовнішньоекономічному середовищі, гнучко перебудовувати управлінські дії та проактивно формувати резервні стратегії.

У науковій статті сформульовано практичні рекомендації щодо інтеграції моделі у корпоративні стратегії безпеки, системи ризик-менеджменту та інструменти контролю ефективності управлінських рішень. Запропонований підхід може бути використаний підприємствами, інвесторами та органами державної влади для підвищення прозорості й прогнозованості



зовнішньоекономічної діяльності, зниження ризику кризових явищ і підвищення економічної стійкості підприємств у міжнародному середовищі.

Ключові слова: ризик-орієнтоване кризове управління; зовнішньоекономічна діяльність; процес аналітичної ієрархії (АНП); сценарне прогнозування; система раннього попередження.

**The integration of risk-based and crisis management approaches in foreign
economic activity management**

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Abstract: The study aims to substantiate and develop an integrated system of risk-based and crisis management in enterprises' foreign economic activities. It argues that under the conditions of war, sanctions, currency volatility, and disrupted logistics, the integration of risk management and crisis management enables companies to build a resilient security environment and minimize strategic vulnerabilities.

The research is based on the systematization of previous studies, identification of key influencing factors, and critical analysis of practical cases. The Analytic Hierarchy Process (AHP) is applied to transform qualitative judgments into quantitative priorities, integrate them into scenario analysis, and calculate an integral threat index for each scenario.

A three-level model of risk-based crisis management is proposed, encompassing risk identification and prioritization, scenario forecasting of crises, and the creation of an early warning system. This approach allows enterprises to detect “weak signals” in the external environment, adjust managerial actions flexibly, and proactively design contingency strategies.

The article provides practical recommendations for integrating the proposed model into corporate security strategies and risk management systems to improve transparency, predictability, and economic resilience in international operations. The approach can be applied by enterprises, investors, and public authorities to enhance the sustainability and competitiveness of foreign economic activity.

Keywords: risk-based crisis management; foreign economic activity; Analytic Hierarchy Process (AHP); scenario forecasting; early warning system.

Problem statement. The contemporary international economic environment is characterized by a high degree of uncertainty and geopolitical turbulence. The intensification of globalization processes, the emergence of new sanction regimes, the escalation of currency and logistics risks, armed conflicts, changes in customs regulations, and financial market instability exert unprecedented pressure on



enterprises engaged in foreign economic activity (FEA). Under such conditions, classical approaches to crisis management and risk management remain fragmented and disconnected, which complicates the timely identification of threats and effective response to them [6; 7].

The core problem lies in the absence of an integrated framework that simultaneously incorporates the preventive dimension (risk management) and the operational dimension (crisis management), merging them into a strategic crisis-oriented management system. Traditional risk management systems are typically limited to identifying and monitoring risks, whereas crisis management systems focus on response mechanisms once crises have already materialised. As a result, a critical link between forecasting, early warning, and operational response is lost, thereby reducing the overall level of enterprise security and competitiveness in international markets [3; 5; 10].

The relevance of this study is determined by the necessity to reorient management systems toward a risk-based approach capable of:

- combining scenario forecasting with early warning mechanisms in FEA;
- ensuring coordination across functional subsystems of the enterprise;
- forming a multi-level model of security environment management that accounts for war-related and post-war risks, as well as rapid shifts in global trade and financial flows [2; 11; 15].

In the context of ongoing war, economic instability, and constant changes in international regulatory practices, the development of models that ensure continuous monitoring of risks, enable timely forecasting of crises, and enhance the adaptability and resilience of enterprises in foreign economic activity becomes particularly urgent [8; 12; 13; 14].

Highlighting previously unresolved parts of the overall problem. Therefore, the absence of an integrated framework that combines preventive, reactive, and strategic dimensions of risk-based crisis management in enterprises' foreign economic activity highlights a pressing need to develop a comprehensive model



enabling a transition from reactive to proactive crisis management in the international economic environment.

Literature review. The analysis of contemporary scientific and applied literature demonstrates that the problem of effective risk management in foreign economic activity (FEA) and the integration of crisis management instruments has become the subject of active research both in Ukraine and abroad [1–15]. In particular, the seminal study by De Boer, Labro, and Morlacchi [1] reviewed methods supporting supplier selection and illustrated the applicability of the Analytic Hierarchy Process (AHP) for risk evaluation in procurement systems. This methodological foundation was later adapted in various studies of supply chain risk prioritization, including the hybrid AHP–PROMETHEE model by Khan and Burnes [3], which emphasized the role of structured decision-making in complex international environments.

Further contributions have explored the role of AHP in the context of export settlements [4] and risk management in supply chains [5], highlighting the possibility of transforming qualitative expert judgments into quantitative priorities for managerial decision-making. Yan, Zhang, and Li [6] and Yildirim & Karaca [7] focused on measuring and evaluating logistics and trade-related risks, particularly under the conditions of international turbulence, confirming the need for scenario-based risk assessment in FEA.

Ukrainian scholars have also made significant contributions to the development of crisis management frameworks. Hobela and co-authors [2] addressed the regulatory and economic dimensions of ensuring resilience in a post-crisis environment, while Hobela [8; 9] and Hobela, Zhyvko et al. [10; 11] developed theoretical and practical approaches to crisis management, modeling of risk-oriented management systems, and the principles of forming a secure environment for enterprises engaged in international trade. Additional studies [12–15] provided classifications of crises, analyses of their impact on enterprises, and systematization



of risks in emergency conditions, emphasizing the importance of resilience during wartime and geopolitical instability.

At the same time, the literature review reveals that while there is a solid methodological base for risk prioritization (AHP, PROMETHEE, scenario analysis) and numerous empirical studies of international trade risks, the issue of integrating preventive risk management, crisis handling, and strategic anti-crisis management into a single risk-based model for enterprises' foreign economic activity remains insufficiently developed. This gap underscores the relevance of the present study, which aims to propose a tri-level Risk-Based Crisis Management model that unites preventive, operational, and strategic approaches, ensuring a transition from reactive to proactive management in the context of global turbulence.

Aim and objectives. The purpose of the article is to develop and scientifically substantiate a model of risk-based crisis management in the foreign economic activity of enterprises. This model is designed to integrate the preventive dimension (risk management), the operational dimension (crisis management), and the strategic dimension (anti-crisis management), while also incorporating scenario forecasting and an early warning system for crisis phenomena.

To achieve this purpose, the article sets the following objectives:

- ❖ to examine the theoretical and methodological foundations of risk management, anti-crisis management, and crisis management in the foreign economic activity of enterprises, and to substantiate the need for their integration.
- ❖ to identify and systematize the key risks and indicators of geo-economic turbulence that affect enterprises' foreign economic activity, and to establish criteria for their prioritization;
- ❖ to construct a scenario-based approach for forecasting crises in foreign economic activity and to justify the use of the Analytic Hierarchy Process (AHP) for determining the weights of risk factors;
- ❖ to design an algorithm for an early warning system of crises that ensures timely identification of signals and coordination of managerial responses;



- ❖ to propose a three-level model of risk-based crisis management that integrates preventive, operational, and strategic dimensions of governance and ensures a closed-loop managerial cycle.

Results. In the course of the study, information on the major risks inherent in enterprises' foreign economic activity was collected and systematized. To achieve this, content analysis of scientific literature [6; 7], international practical cases, and the results of expert surveys involving specialists in foreign economic relations was applied. Based on the obtained data, a list of risks was formed that most significantly affect the security environment of the enterprise and therefore require continuous monitoring (Table 1).

Table 1.

Risk matrix by probability and impact parameters

№	Risk category	Examples of manifestation	Probability	Impact	Monitoring indicators/indicators
1	Currency	Devaluation, exchange rate volatility, currency restrictions	high	high	Volatility index, currency derivative spread, average monthly rate
2	Logistics	Disruptions in transport corridors, rising tariffs, container shortages	medium	high	Delivery time, freight cost, % of supplier rejections
3	Political/sanctions	New barriers, changes in customs regulations, sanctions lists	medium	high	Number of sanctions, changes in customs rates, political risk ratings
4	Information/cyber	Cyberattacks, data leaks, reputation attacks	medium	medium	Number of incidents, media index of negative mentions, level of cybersecurity
5	Human Resources	Staff turnover, lack of qualified personnel	medium	medium	% of staff turnover, number of vacancies, supply and demand ratio
6	Energy/resources	Power outages, raw material shortages	low	high	Frequency of outages, average prices for resources, volume of reserves

Source: developed by authors based on [2; 4-7; 14-15]



The table presents categories of risks, examples of their manifestation, probability of occurrence, level of impact, and corresponding indicators/monitoring parameters. This structure enables the visualization of the enterprise's risk profile, identification of “critical points,” and the establishment of a foundation for subsequent stages—namely, risk prioritization, scenario forecasting, and the development of an early warning system.

For each group of risks, a system of indicators has been designed that may serve as triggers within both early warning and scenario analysis frameworks. These indicators encompass:

- quantitative financial and economic parameters (exchange rates, spreads, transportation costs, volumes of exports/imports);
- regulatory signals (number of new sanctions, changes in tariffs and customs duties);
- operational and organizational metrics (delivery time, rejection rates, employee turnover, energy reserves);
- informational and reputational indices (number of cyberattacks, negative media coverage, level of cyber protection).

Thus, the constructed risk matrix provides a comprehensive understanding of vulnerabilities in the enterprise's foreign economic activity, creating a basis for risk prioritization and for modeling crisis development scenarios [3; 6].

The next stage involves determining the risk weights using the Analytic Hierarchy Process (AHP/Saaty method), which allows for the transformation of qualitative judgments regarding the importance of risk groups into quantitative priorities. Similar approaches have been successfully applied in studies on international trade and supply chain risk management [1; 3; 5].

The hierarchy was constructed as follows: goal (prioritization of risks in foreign economic activity) → criteria (risk categories). The Saaty scale (1–9) was applied for pairwise comparisons. The principal eigenvector of the pairwise comparison matrix was calculated, and consistency was verified (CI, CR).



Table 2 presents the baseline risk categories and their weights. For expert and analytical judgments, pairwise comparisons were conducted based on the following logic: currency risks are somewhat more prioritized compared to logistical and political risks; energy-related risks rank lower, while informational/cyber and human resource risks are considered of the lowest priority.

Table 2.

Risk weighting coefficients (AHP) and their scenario levels of impact in the foreign economic activity of the enterprise

Risk Category	Weight (ANP)	Optimistic (impact level)	Baseline (impact level)	Pessimistic (impact level)
Currency	0.3422	0.3	0.5	0.9
Logistics	0.2057	0.3	0.6	0.8
Political/sanctions	0.2057	0.2	0.5	0.9
Information/cyber	0.1219	0.2	0.4	0.7
Human Resources	0.0753	0.1	0.3	0.6
Energy/resources	0.0492	0.1	0.3	0.5

The calculated weights (normalized priorities) and consistency indicators indicate the acceptability of the model:

- currency – 0.3422
- logistics – 0.2057
- political/sanctions – 0.2057
- energy/resources – 0.1219
- information/cyber – 0.0753
- personnel – 0.0492.

The obtained priority structure reflects the “critical triad” for foreign economic activity: currency, logistical, and political/sanction-related risks form the core of the risk profile (approximately 75% in total), which should guide response scenarios and



the triggers of the early warning system. Energy/resource risks occupy a mid-level position ($\approx 12\%$), while informational/cyber and human resource risks demonstrate the lowest priorities ($\approx 12\%$ in total).

After determining the risk weights, the next logical step was scenario forecasting of crises, which transforms the static risk profile into a dynamic model of their evolution. This approach makes it possible to simulate the impact of external factors and to develop adaptive management decisions [3].

This stage aims to construct a system of scenarios for crisis development in the enterprise's foreign economic activity and to calculate an integrated threat index for each scenario. The logic of scenario design is based on the premise that, following the weighting of risks, it is necessary to evaluate the probable level of their impact under different conditions (optimistic, baseline, and pessimistic scenarios). This transition allows the static risk map to be transformed into a dynamic model, showing how the threat profile shifts depending on external drivers.

Scenario analysis includes:

- identifying the key drivers of uncertainty;
- constructing three scenarios (optimistic, baseline, pessimistic);
- integrating weights (AHP) – assigning importance to each risk in every scenario;
- calculating the integrated threat index – applying the sum of weighted impacts to obtain a consolidated measure (Table 3);
- visualization – presenting the results in matrix form and graphical schemes to ensure clarity.

Based on the risk weights derived from the Analytic Hierarchy Process (AHP) and the levels of their impact across the three scenarios, the integrated threat index was calculated for each case. The calculation was performed using the following formula:

$$II = \sum_{i=1}^n w_i + I_{i,s}$$

Where: $I_{i,s}$ – the level of impact of risk i in the scenario s ;



w_i – risk weighting factor i ;

The results are presented in the table 3.

Table 3

Scenario assessment of the integral threat index

Scenario	Integral Threat Index (II_s)
Optimistic	0.23
Basic	0.49
Pessimistic	0.79

The obtained values of the integrated threat index demonstrate a significant divergence across scenarios: under the optimistic scenario, the enterprise faces only a moderate level of risks, whereas the baseline scenario reflects a medium level of threats, and the pessimistic scenario indicates a high level, requiring maximum preparedness and preventive measures. Such a comparison enables the transformation of a static risk profile into a dynamic management system, in which risk indicators and weights function as a unified integral tool.

Based on these integrated assessments, it becomes possible to establish threshold values for each risk indicator and to design triggers that automatically signal the deterioration of the external economic environment. The next stage of the study was therefore the development of an early warning system, which consolidates all previous stages into a coherent management logic (Table 4).

Table 4

Triggers and risk thresholds in an enterprise early warning system

Risk Category	Main indicator	Threshold values	Trigger/alarm	Recommended action
Currency	Exchange rate fluctuations (UAH/USD)	<3% / 3–7% / >7%	Devaluation >7% per week	Hedging, contract review
Logistics	Delivery time (days)	<5 / 5–10 / >10	Average delivery time >10 days	Search for alternative routes
Political/sanctions	Number of new sanctions	0 / 1–2 / >2	>2 sanctions	Partner audit, legal due diligence
Information/cyber	Frequency of supply	<1 / 1–3 / >3	per month >3	Formation of reserves



	disruptions			
Human Resources	Number of incidents	<1 / 1–3 / >3	outages/month >3	Increasing cyber security
Energy/ resources	% staff turnover	<5 / 5–10 / >10	incidents/month >10%	Personnel retention programs

The indicators, threshold values, and triggers presented in Table 4 demonstrate how the results of the previous stages—risk identification, prioritization, and scenario forecasting—are integrated into a unified monitoring system. Each trigger reflects a threshold level of risk, the exceedance of which automatically signals the need for managerial intervention. This approach enables enterprises to promptly respond to the “weak signals” of crises and to adjust their level of preparedness in a timely manner.

The final stage of the study is the development of an algorithm for the functioning of an early warning system that integrates monitoring of indicators, comparison with threshold values, generation of warning signals, and activation of appropriate managerial decisions. This stage establishes the “nervous system” of the enterprise, transforming Risk-Based Crisis Management from a set of analytical tools into an effective proactive mechanism for managing crises.

The objective of this final stage is to design an early warning system algorithm that incorporates:

- risk indicators identified in the previous stages;
- threshold values for each scenario;
- automatic triggers and KPIs for managerial decision-making;
- real-time visualization of signals via an interactive dashboard.

The implementation algorithm for this stage includes:

- selection of indicators for each risk;
- determination of threshold values according to the scenario;
- identification of triggers, i.e., conditions under which the system automatically generates a warning;
- dashboard integration, allowing visualization of key indicators and a traffic-light signaling system (green/yellow/red);



– development of a response protocol, outlining managerial actions for each threat level.

Based on these data, an algorithm for the functioning of the early warning system has been proposed, consisting of five steps: monitoring of indicators → comparison with thresholds and scenarios → updating thresholds/learning of the system → automatic notification of responsible personnel → activation of response protocols.

This algorithm operates as a closed loop: with each new signal, the system updates the integral threat index, and after the response it adjusts threshold values and procedures, thus forming a mechanism of “learning from experience.”

The early warning system, integrated into Risk-Based Crisis Management, makes it possible to:

- detect negative trends at early stages;
- assess the dynamics of risks in real time;
- enhance the speed of response and the effectiveness of crisis management;
- shift management from a reactive to a proactive mode.

Thus, the study develops a completed cycle of a dynamic risk-oriented crisis management model and establishes the foundation for strengthening the economic resilience of enterprises in the international environment.

Conclusions. Risks of enterprises’ foreign economic activity were systematized through content analysis of scientific literature, international case studies, and generalized expert assessments. Risk weights were determined using the Analytic Hierarchy Process (AHP), which made it possible to transform qualitative judgments about the importance of risk groups into quantitative priorities. The resulting structure of priorities confirmed the dominance of the “critical triad” of risks (currency, logistics, political/sanction-related) in the enterprise’s risk profile.

A scenario-based framework for forecasting crises in foreign economic activity was developed, incorporating three alternative scenarios (optimistic, baseline, pessimistic). This framework enables the dynamic assessment of risk impacts and the



calculation of an integrated threat index, thus ensuring a transition from static analysis to scenario modeling and proactive management.

Future research should focus on an in-depth empirical validation of the proposed Risk-Based Crisis Management model using data from specific enterprises and industries, as well as on expanding the system of indicators by incorporating social, environmental, and reputational factors that influence enterprise vulnerability in international operations. It is advisable to integrate digital predictive analytics and machine learning technologies into the early warning system to enhance monitoring accuracy and response speed. Further development is also needed in the direction of international comparative studies, which would allow the adaptation of the model to different national contexts and assess its universality in the global business environment.

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