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PROBLEM OF FORMING A SYSTEM FOR PREVENTING CORRUPTION RISK IN THE CONTEXT OF POST-WAR RECONSTRUCTION IN UKRAINE USING AI

ПРОБЛЕМИ ФОРМУВАННЯ СИСТЕМИ ЗАПОБІГАННЯ КОРУПЦІЙНИМ РИЗИКАМ В УМОВАХ ПІСЛЯВОЄННОЇ ВІДБУДОВИ В УКРАЇНІ З ЗАСТОСУВАННЯМ ШТУЧНОГО ІНТЕЛЕКТУ

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The end of Russia's military aggression and the subsequent reconstruction are a new challenge for Ukrainian business and government agencies. For immediate recovery, it is necessary to form a pool of enterprises of strategic importance to Ukraine's economy. The article provides a comprehensive study of the role of enterprises of strategic importance in the process of Ukraine's post-war recovery. When formulating reconstruction plans, it is necessary to take into account reforms for integration into the EU and improvement of the investment climate related to the fight against corruption risks. The purpose of the article is to substantiate the essence, trends and determinants of the development of a system for preventing corruption risks in the context of post-war reconstruction in Ukraine using artificial intelligence. Based on the results of the study, a conceptual model of a system for preventing corruption risks using digital solutions and artificial intelligence models to ensure transparent and effective restoration of economic potential is proposed.

Keywords: anti-corruption measures, strategic enterprises, economic recovery, artificial intelligence.

Завершення військової агресії РФ та наступна відбудова – це нове випробування для українського бізнесу та державних органів. План відновлення України включає комплекс заходів з відбудови, модернізації та розвитку країни після війни. Основними напрямками відбудови стануть напрямки пов'язані з відновлення житлової та соціальної інфраструктури, зміцнення обороноспроможності, розвиток перспективних галузей економіки, забезпечення енергетичної незалежності. При визначенні галузей, які потребують першочергового відновлення необхідно сформувати пул підприємств стратегічного значення для економіки України. У статті здійснено комплексне дослідження ролі підприємств стратегічного значення у процесі повоєнного відновлення України. З огляду на масштабні руйнування інфраструктури, втрату виробничих потужностей та економічну дестабілізацію, саме стратегічні підприємства відіграють ключову роль у забезпеченні обороноздатності, енергетичної незалежності та стабільного функціонування критичної інфраструктури. У роботі акцентовано увагу на необхідності глибокого аналізу поточного стану таких підприємств, їх аудиту та оцінки здатності адаптуватися до нових викликів. При формуванні планів відбудови необхідно враховувати реформи для інтеграції в ЄС та покращення інвестиційного клімату які пов'язані з боротьбою з корупційними ризиками. Загальна оцінка потреб на наступне десятиліття відповідно до попереднього плану відбудови становить близько \$524 млрд., що є значною сумою, яка перевищує ВВП України за 2024 рік майже в три рази, що вказує на необхідність залучення зовнішніх інвесторів, які потребують чітких та прозорих умов здійснення діяльності з мінімальними корупційними ризиками. Метою статті є обґрунтування сутності, тенденцій та детермінантів розвитку системи

запобігання корупційним ризиках в умовах післявоєнної відбудови в Україні з застосуванням штучного інтелекту. За результатами дослідження запропоновано концептуальну модель системи запобігання корупційним ризикам з застосуванням цифрових рішень та моделей штучного інтелекту для забезпечення прозорого та ефективного відновлення економічного потенціалу.

Ключові слова: антикорупційні заходи, стратегічні підприємства, відбудова економіки, штучний інтелект.

Statement of the problem. The total amount of direct losses incurred by Ukraine as a result of the war, from the start of the full-scale invasion to April 2025, is estimated (according to the results of a study by the KSE Institute) at \$247.5 billion. These are fairly approximate figures, which are considered as a guideline for planning the post-war reconstruction of the state. At the same time, the total number of damaged or destroyed residential buildings, including private and multi-family houses and dormitories, is almost 158,000 [1]. Given the above figures, it is clear that the demand from society is quite clear and understandable – the reconstruction of Ukraine should become the quintessence of a joint victory in the war against the aggressor. And as a country, we must not only repair what has been destroyed and damaged, but also create something better than it was before. In this area of work, we need high-quality and objective data, as well as the political will to rely on it. According to the results of a sociological study commissioned by Transparency International Ukraine, 76% of the population and 78% of business representatives are in favour of decentralising the reconstruction process. Similarly, 60% of the population and 68% of businesses support project-based reconstruction assistance. They also advocate for transparency of information about reconstruction and maximum involvement in the decision-making process [2].

In post-war reconstruction, corruption risks arise due to significant amounts of funding, excessive concentration of power, weak institutions and the need for quick decisions, which creates opportunities for bribery, abuse of power, embezzlement and other forms of corruption that undermine trust in the state, hinder economic development and complicate the achievement of reconstruction goals.

Analysis of recent research and publications. The study of post-war reconstruction issues is of interest to a large number of representatives of the scientific community and the general public. Issues related to the development of the real sector in the context of war and post-war economic recovery in Ukraine have been studied by A. M. Lysenko [5], O. V. Sobkevich, A. V. Shev-

chenko, V. M. Ruslan, and others, edited by Ya. A. Zhalila [5]. Voytovich, L. M. [5], Fedyk, M. V. [5] consider the strategy of post-war economic recovery in Ukraine in the context of European integration. The publication 'An Outline of Ukraine's Reconstruction' by the Centre for Economic Policy Research [7] defines the basic principles and approaches to post-war reconstruction. While recognising the importance of the scientific achievements of these scholars, we note that the definition of the concept of a 'strategic enterprise' has not been sufficiently addressed and that the system of transparent supervision, monitoring and digital analysis of the activities of strategic enterprises needs to be improved, taking into account corruption risks.

Highlighting previously unresolved parts of the overall problem. The comparative analysis revealed the absence of a single conceptual model of a system for preventing corruption risks using digital solutions and artificial intelligence models to ensure transparent and effective restoration of economic potential after military aggression.

Formation of the objectives of the article (task statement). The purpose of the article is to substantiate the essence, trends and determinants of development, to justify the importance of systematic analysis and audit of strategically important enterprises in the context of post-war transformation of Ukraine's economy, as well as to develop practical recommendations for improving their efficiency through the introduction of anti-corruption measures.

Summary of the main research material. The future end of Russia's military aggression and the beginning of post-war reconstruction is a new challenge for Ukrainian business and government agencies. Ukraine's recovery plan includes a set of measures for the reconstruction, modernisation and development of the country after the war. The main areas of reconstruction will be related to the restoration of housing and social infrastructure, strengthening defence capabilities, developing promising sectors of the economy and ensuring energy independence. When determining the sectors that need priority reconstruction, it is necessary to form a pool of enterprises of strategic importance for Ukraine's

economy. Given the large-scale destruction of infrastructure, loss of production capacity and economic destabilisation, it is strategic enterprises that play a key role in ensuring defence capability, energy independence and the stable functioning of critical infrastructure. is related to the need to improve the efficiency of public resource management and reduce the risks of misuse of international aid in the context of post-war reconstruction

After the Russian Federation's full-scale invasion of Ukraine, strategic enterprises became particularly important in ensuring the country's economic stability, defence capability and energy independence. In the context of the war and post-war period, their role has grown significantly, as these entities are capable of ensuring the restoration of critical infrastructure, facilitating the reintegration of affected territories, and shaping a new economic development model. Ukrainian legislation does not define the concept of a strategic enterprise, so the authors propose that strategic enterprises be understood as enterprises that are of key importance for national security, the functioning of critical infrastructure, and the provision of basic services and resources to citizens. According to the authors, these include energy, defence and industrial complex, transport and communications facilities, as well as large state-owned corporations.

In the context of the war, most strategic enterprises have suffered significant losses: destruction of infrastructure, reduction of production capacity, decline in exports, and staff shortages. Despite this, some of them were able to adapt and ensure stable operation, which indicates a high level of resilience and potential for recovery. This is especially true for energy companies, defence enterprises, and logistics centres [2].

In the context of Ukraine's post-war recovery, it is important to thoroughly assess the current state of key economic sectors that determine the potential for sustainable development and reconstruction, considering the most important strategic sectors [2]:

1. Economy – at the beginning of the large-scale aggression, Ukraine lost up to 50% of its production capacity. Industry, infrastructure and housing were particularly affected. The agro-industrial complex remained a strategic sector, accounting for over 40% of total exports. However, about a third of agricultural land was not sown, which significantly affected export potential. A significant proportion of the working-

age population was displaced, causing labour shortages in regions and in certain industries.

2. Trade – seaports, as the main export channel, remain under threat or blocked. Limited land logistics through the EU is leading to an imbalance in foreign trade: imports have recovered to 80-90% of pre-war levels, while exports remain significantly lower. This creates a trade deficit, which complicates the financial stability of the country and exporting companies.

3. Energy – despite the threat from Russia, Ukraine's energy system has remained functional: gas storage facilities are operating and the power grid is synchronised with the European grid. At the same time, the lack of domestic production of petroleum products leaves Ukraine vulnerable in terms of energy. This is critically important for strategically important enterprises, whose stable operation requires a guaranteed energy supply.

4. Public finances – the government has taken extraordinary measures to support the population and businesses: a simplified taxation system has been introduced, and import taxes and excise duties on fuel have been reduced. This has supported the solvency of the domestic market, in particular small and medium-sized businesses, some of which may be classified as enterprises of strategic importance.

5. Monetary policy – the National Bank of Ukraine fixed the exchange rate during critical periods, keeping inflation in check. However, elevated inflationary pressures remain a serious challenge for the economy. Under a regulated exchange rate, currency risks are increasing, especially for import-dependent enterprises.

The reconstruction of Ukraine after large-scale military aggression by the Russian Federation will be the largest project of its kind in Europe since World War II. Therefore, the need for a systematic approach to resource management, project management and oversight of their implementation is critically important. Strategic enterprises in this process not only play the role of an economic framework, but also become beneficiaries and drivers of infrastructure transformation [4].

One of the key challenges is to build a unified digital ecosystem for managing national recovery projects, taking into account corruption risks. Such a system should ensure[2]:

- full digital transparency of all projects — from identifying needs to completing construction or modernisation;
- connection of existing registries and platforms (e.g., Prozorro, DIA, state cadastres);

- automated control over the effectiveness of implementation, the responsibility of contractors, and the use of resources.

For enterprises of strategic importance, this means having clearly defined digital criteria for access to financing, participation in public projects, and feedback to the state. Transparency and real-time auditing minimise the risks of corruption and inefficiency, which is particularly relevant during wartime and the post-war period.

Digital control over resource allocation includes [2]:

- accounting and revaluation of state property (land, subsoil, infrastructure facilities) that could potentially be transferred to concession or management of strategic enterprises;
- management of public-private partnership programmes, where national industrial players play a key role;
- control and audit of the use of confiscated property, humanitarian aid and materials for reconstruction.

A key element is the creation of conditions for fair and transparent access to resources, which will allow enterprises of strategic importance to participate in large-scale projects of modernisation, construction, energy reconstruction, etc.

Anti-corruption auditing in the context of post-war reconstruction should not only serve as a post-factum check, but also be integrated into the digital project management infrastructure. This includes [7]:

- auditing decisions at all stages of implementation (planning, procurement, execution);
- assessing the compliance of strategic enterprises with the conditions for participation in national programmes;
- ensuring compliance with the principles of sustainable development, environmental safety and social responsibility.

The digital transformation of the audit function involves the creation of independent automated control mechanisms that are capable of operating 24/7 and responding promptly to violations or deviations.

In the context of Ukraine's post-war transformation, digital solutions that enable systematic coordination of resources and anti-corruption audits of strategic enterprises play a key role in ensuring transparent and effective recovery. Since these enterprises are often the executors or key participants in state projects, the introduction of digital infrastructure will reduce corruption risks, increase the efficiency

of resource allocation, and strengthen trust in state processes [5].

In the context of Ukraine's post-war transformation, digital solutions aimed at preventing corruption risks play a key role in ensuring transparent and effective recovery. These solutions enable systematic coordination of resources and ensure the formation of an anti-corruption audit system for strategic enterprises. Since these enterprises are often the executors or key participants in state projects, the introduction of digital infrastructure will reduce corruption risks, increase the efficiency of resource allocation, and strengthen trust in state processes.

That is why we propose to introduce the following elements:

1. Digital integrated platform

The significant destruction caused by the Russian Federation's armed aggression and the large number of potential donors may lead to the need to attract significant financial resources and difficulties in coordinating participants. That is why we propose to introduce a single integrated digital platform to ensure transparency in relations and prevent corruption risks. The digital integrated platform will allow tracking the entire funding path – 'from the donor to a specific object or enterprise.' The platform should combine data from existing state systems (Prozorro, EDESSB, spending.gov.ua, etc.) and ensure the accounting of funds at all levels of the budget. This will enable effective anti-corruption auditing of expenditures and the detection of deviations at the initial stages of project implementation.

2. Coordination of donor assistance through digital impact charts

Insufficient synchronization of processes between partners and internal structures in Ukraine creates risks of ineffective reconstruction financing. Therefore, the use of artificial intelligence (AI) to analyze and compare digital stakeholder maps, evaluate budget planning schedules, and control signal systems ('red flags') will formalise and coordinate the activities of international donors, avoid duplication of initiatives, and facilitate anti-corruption audits.

3. Project selection – transparency and standardization

A digital module based on AI tools for collecting and prioritizing projects will help avoid subjectivity during their selection. Standardized applications, automated classification, and ranking based on clear criteria will ensure equal access to financing for strategic enterprises. Another important safeguard is the ability to

publicly track project implementation, which will significantly increase the transparency and objectivity of audits of post-war reconstruction project financing.

4. Register of restoration objects

For effective interaction between enterprises and donors, it is necessary to create a register of all objects subject to restoration. It should contain information about responsible persons, the status of work, and funding volumes, which will serve as a basis for analytics and real-time reporting.

5. Independence of the digital system as a guarantee of reliability

The digital architecture must be technically protected from external interference, and all changes to it must be recorded with a digital trace. This increases transparency and enables independent anti-corruption audits of individual reconstruction projects. The participation of civil society, the media and experts in monitoring is an additional safeguard against corruption risks.

6. Improving digital literacy

The implementation of a digital governance model requires the professional development of

civil servants and specialists who will be involved in post-war reconstruction activities. It is also important to introduce training programmes and provide technical support for the newly created digital platform, which in turn will stimulate the development of the Ukrainian IT sector.

Conclusions. The implementation of digital solutions in the field of recovery opens up fundamentally new approaches to managing donors' financial resources, contributes to the functioning of anti-corruption audits, and prevents the emergence of corruption risks at strategic enterprises. This, in turn, creates the conditions for the effective, honest, and economically viable post-war reconstruction of Ukraine.

The implementation of digital solutions in the field of reconstruction opens up fundamentally new approaches to the management of enterprises of strategic importance. They become not only participants in state projects, but also subjects of constant anti-corruption audits, transparent monitoring and digital analytics. This, in turn, creates the conditions for the effective, honest and economically viable post-war reconstruction of Ukraine.

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