Military Tax in Ukraine as a Tool for Finansing the Needs of the Security and Defense Sector

Військовий збір в Україні як інструмент фінансування потреб сектору безпеки та оборони

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Purpose. Comprehensive assessment of the institutional, fiscal, and socio-economic effectiveness of military tax in Ukraine in 2014–2025 and scientific basis for the optimal scenario for its reform based on a multi-criteria analysis of alternatives.

Method. The study employs historical-legal and comparative-normative analysis to systematize legislative changes in 2014–2025, statistical analysis of budget indicators and reports of the Accounting Chamber, and an expert survey with consistency verification using Kendall's coefficient of concordance. Alternative reform scenarios are evaluated using the TOPSIS multi-criteria decision-making method, including the construction of a decision matrix, determination of weight coefficients, and calculation of the closeness index to the ideal solution. The robustness of results is tested through sensitivity analysis, scenario modelling, and Monte Carlo simulation.

Findings. The study identified contradictions between the legal status of the levy and its actual tax nature. Legislative changes in 2024–2025 strengthened its fiscal role, turning it into an important source of domestic resource mobilization. Multi-criteria modelling using the **TOPSIS** method showed that the most balanced reform scenario is **A5** (progressive scale and a special defence fund). Kendall's concordance coefficient (**W = 0.735**) confirmed the consistency of expert assessments, while sensitivity analysis and **Monte Carlo** simulation (5,000 iterations) demonstrated the robustness of the results.

Practical implications. The findings provide an analytically grounded basis for improving Ukraine's defence taxation policy under wartime conditions. The proposed reform framework ensures a balance between fiscal mobilisation capacity, social justice, legal certainty, and transparency of public finance management. The applied multi-criteria evaluation methodology may be used by policymakers in designing amendments to tax legislation and in shaping strategic decisions regarding sustainable defence financing.

Paper type. Theoretical article.

Key words: Defence Financing, Defence Procurement, Sustainable Development, Public Finance, Wartime Economy, Tax Policy, Efficiency of Budget Expenditures, Multi-Criteria Decision Making, Topsis, Transparency and Accountability

Мета роботи. Комплексна оцінка інституційної, фіскальної та соціально-економічної ефективності функціонування військового збору в Україні у 2014–2025 роках та наукове обґрунтування оптимального сценарію його реформування на основі багатокритеріального аналізу альтернатив.

Метод дослідження. У дослідженні застосовано історико-правовий і порівняльно-нормативний аналіз законодавчих змін 2014–2025 рр., статистичний аналіз бюджетних показників і матеріалів Рахункової палати, а також експертне опитування з перевіркою узгодженості оцінок за коефіцієнтом Кендалла. Альтернативи реформування оцінено методом багатокритеріального аналізу **TOPSIS**. Робастність результатів перевірено за допомогою аналізу чутливості, сценарного моделювання та **Monte Carlo** симуляції.

Результати дослідження. Виявлено суперечність між правовим статусом військового збору та його фактичною податковою природою. Законодавчі зміни 2024–2025 років суттєво посилили його фіскальну роль, перетворивши на важливе джерело мобілізації внутрішніх ресурсів. Багатокритеріальне моделювання за методом **TOPSIS** визначило найбільш збалансованим сценарієм реформування альтернативу **A5** (прогресивна шкала та спеціальний оборонний фонд). Коефіцієнт конкордації Кендалла (**W = 0,735**) підтвердив узгодженість експертних оцінок, а аналіз чутливості та **Monte Carlo** моделювання (5000 ітерацій) — структурну стійкість результатів.

Практична цінність дослідження. Отримані результати створюють науково обґрунтовану основу для вдосконалення податкової політики у сфері оборонного фінансування в умовах воєнної економіки. Запропонований підхід поєднує фіскальну мобілізацію ресурсів із принципами соціальної справедливості, правової визначеності та прозорості використання коштів. Методологія багатокритеріального оцінювання може застосовуватися органами державної влади під час розроблення змін до податкового законодавства та стратегічних рішень щодо фінансування сектору безпеки і оборони.

Тип статті. Теоретична.

Ключові слова: фінансування оборони, оборонні закупівлі, сталий розвиток, публічні фінанси, воєнна економіка, податкова політика, ефективність бюджетних видатків, багатокритеріальний аналіз рішень, TOPSIS.

Introduction

The military tax (MT) was introduced in Ukraine in August 2014 as a temporary economic instrument aimed at attracting additional resources to the state budget to finance the country's defence needs in the context of armed aggression.

This article analyses the MT from 2014 to 2025 and its economic feasibility, as well as possible ways to develop this tax. The initial rate of the tax was 1.5 per cent of the taxable base, and its introduction was seen as a necessary, short-term measure to stabilise the state's financial system in the context of military operations in eastern Ukraine. In 2015, despite its initial temporary nature, the term of the MT was extended indefinitely. This decision was justified by the need to ensure sustainable financial support for the reform and modernisation of the Armed Forces of Ukraine, to increase the state's defence capability, and to cover growing security costs. Thus, the MT has gradually transformed into a permanent element of the tax system, although its legal status remains enshrined in the "Transitional Provisions" section of the Tax Code of Ukraine.

The full-scale invasion of the Russian Federation in 2022 radically changed economic priorities, necessitating the maximum mobilisation of internal financial resources. This led to the intensification of legislative initiatives aimed at increasing the budgetary role of MT, improving its administration mechanisms and centralising defence financial flows. In the context of a war economy, the MT has acquired not only economic but also socio-political significance, serving as a symbol of citizens' solidarity in the cause of national defence and the restoration of Ukraine's statehood.

The research hypothesis assumes that reform scenarios incorporating structural institutional changes (legal harmonisation, progressivity, and earmarked allocation of funds) will demonstrate higher multi-criteria efficiency compared to the current model or simple rate adjustments, as assessed through a TOPSIS-based evaluation framework.

The main problem accompanying MT is its legal and economic inconsistency. In Ukraine, the MT is defined as a national tax. Despite being called a "tax", the MT does not meet the criteria established by the Tax Code of Ukraine, as it does not provide taxpayers with any special benefits, which is an essential feature of a true tax. This legal uncertainty compromises the correctness of its classification and creates potential risks in the field of tax administration.

In addition, despite its intended purpose (defence financing), the proceeds of the MT are not credited to a separate special fund, but to the general fund of the State Budget. This practice makes it impossible for taxpayers to control its intended use.

An analysis of the budgetary role of the MT until 2022 shows its limited impact on the financing of the defence sector. Between 2014 and 2022, total revenues from the MT amounted to UAH 165.6 billion, covering only about 10-11 per cent of expenditures directed exclusively to the financing of the Ministry of Defence of Ukraine. This indicates the structural inability of the MT mechanism in its original form (with a rate of 1.5% and non-targeted allocation) to function as an effective financial instrument for supporting the army, making it more of a symbolic solidarity tax than a real source of defence funding (Accounting Chamber of Ukraine, 2023).

A fundamental prerequisite for revising the role of the MT was the limited use of international financial assistance, most of which is intended to cover non-military expenditures (salaries for doctors, teachers, social programs), while exceptions for the defense sector are insufficient, creating a need to revise the MT. Under these circumstances, there is a need to transform the MT into a real mechanism for mobilizing domestic financial resources, which will ensure stable financing of the security and defense sector, as well as the development of the domestic defense-industrial complex (DIC).

The scientific novelty of the study lies in the development and practical application of an integrated multi-criteria evaluation framework for assessing reform scenarios of the MT under conditions of martial law. Unlike previous studies that mainly provide descriptive analysis or focus

on legal interpretation, this research combines institutional-legal assessment with quantitative multi-criteria modelling within a unified analytical structure.

For the first time, the problem of MT is incorporated into a structured decision matrix and evaluated alongside fiscal capacity, social justice, administrative feasibility, transparency, and legal certainty. The study also verifies the consistency of expert judgments using Kendall's coefficient of concordance and tests the robustness of ranking results through sensitivity analysis, including One-at-a-Time weight variation, scenario-based adjustments, and Monte Carlo simulation.

In addition, the research systematises the legislative changes of 2024–2025 and proposes a set of alternative reform models that can be selected depending on short- and long-term priorities of defence taxation policy.

Literature review

The issue of the functioning and reform of the MT in Ukraine has been actively researched by scholars since its creation, especially in the context of martial law and the growing needs of the defence sector. Theoretical foundations of optimal taxation, which underpin the proposed reform models, are based on the work of J. Mirrlees, (1971), who explored the balance between efficiency and equity in income taxation. The broader macroeconomic impact of military expenditures on growth is analyzed by J. Yildirim, S. Sezgin, and N. Öcal (2005), emphasizing the potential for stimulating growth through defense spending in specific regions.

Methodological approaches to assessing military and economic capabilities and management in capability-based systems are presented in the works of M. Tkach and Tkach, I., Yasenko, S., Brychenko, I., & Loshontsi, P. (2022), as well as S. Yasenko and I. Tkach (2023).

Regarding analytical tools, the evolution and application of the TOPSIS method for solving complex decision-making problems are comprehensively covered in the review by E. Zavadskas et al. (2016). In the Ukrainian context, O. Artushenko (2023) justifies the use of multi-criteria optimization methods for the financial support of military units, and O. Artushenko et al. (2025) apply TOPSIS to model the vulnerability of military potential.

Furthermore, the Analytical Hierarchy Process (AHP), developed by R. Saati (1987) remains a fundamental tool for prioritization in this field (Saaty, T. L., 1987).

In the paper "Military tax and military bonds as components of budget policy during martial law", V. Shubin shows that in 2020–2021, the MT covered approximately 20–22% of defence expenditures, but due to the misappropriation of funds to the general fund of the state budget, the real impact of the tax on defence financing remains lower than its potential. This means that a significant portion of the funds that were supposed to be directed to the defence sector were used for other purposes, which weakened the capabilities of the Armed Forces of Ukraine. The author emphasises the need to review the unified approach to the object of taxation, taxpayers and the rate of the tax, taking into account the real resource needs of the defence sector (Shubin, V. M., 2022).

In their paper "Military Tax: Theoretical Aspect", L. Markova and R. Alekseeva highlight the key problems of MT collection: non-inclusion in the list of national taxes in accordance with Article 9 of the Tax Code of Ukraine; double taxation of personal income; the transfer of revenues to the general budget fund instead of the special-purpose fund; violation of the principles of social justice. The researchers propose to define the tax base as the amount of income reduced by a single social contribution, to introduce differentiated rates depending on the level of income, and to provide benefits for certain categories of citizens (Markova, L. I., & Alieksieieva, R. V., 2023).

"Reforming Military Service in Ukraine under Martial Law: Analysis of Legislative Initiatives", N. Atamanchuk and L. Kasyanenko emphasise the need to legislate the status of military service as a national tax and to create a special defence fund for the targeted use of revenues exclusively for financing the Armed Forces of Ukraine. The authors argue that it is unacceptable to abolish the tax

under martial law and justify the introduction of differentiated rates instead of a single 5% rate to ensure fair taxation and fulfil a regulatory function (Atamanchuk, N. V., & Kasianenko, L. V., 2024).

Materials and methods

The study is based on the use of general scientific and special methods, the choice of which is detrmined by the goal of analysing the transformation of the payment from a temporary economic instrument to a permanent element of the tax system.

The research methodology is presented in Figure 1, outlining the key stages of the study. It includes the analysis of legal and statistical data, expert survey, international comparison, and the development of an optimal reform model using multi-criteria decision-making methods.

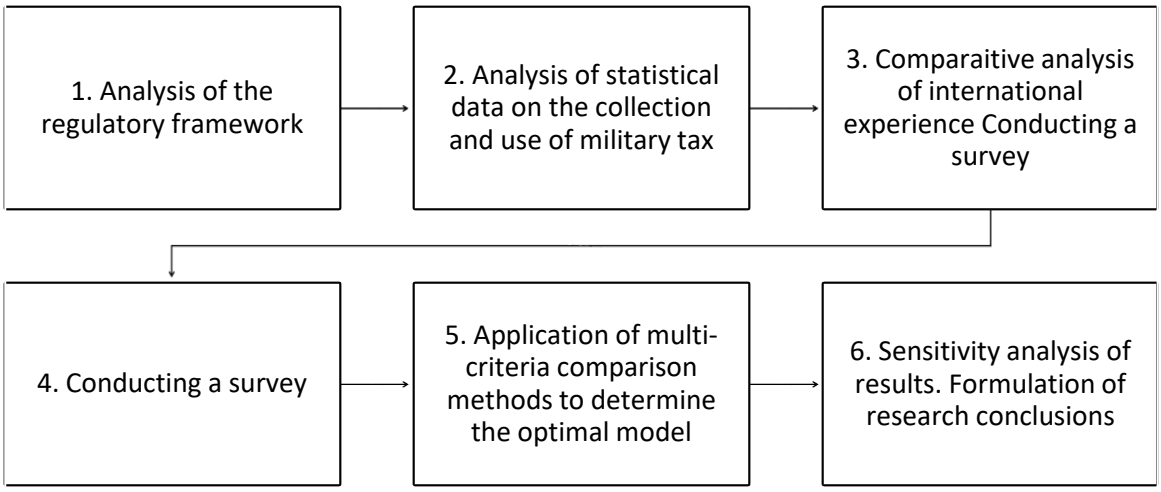

Figure 1: Research Methodology Algorithm

Source: *systemized by authors*

1. At the first stage, historical-legal and comparative-normative methods will be applied to examine the legislative basis of the military levy, focusing on the provisions of the Tax Code of Ukraine and the amendments introduced by Law No. 4015-IX (October 10, 2024). This step aims to identify possible legal conflicts regarding the status and structure of the levy.

2. Statistical methods and quantitative comparison will be used to analyse trends in state budget revenues generated by the military levy. Official data from the Ministry of Finance and the State Tax Service of Ukraine for the period 2014–2025 will serve as the primary data source.

In the study, a comprehensive statistical analysis was conducted to verify the hypothesis of low fiscal autonomy of the MT and identify deficiencies in its administration system. The work within this step included a series of analytical procedures, the first of which was an analysis of long-term revenue dynamics. Using reports from the Ministry of Finance and the State Tax Service of Ukraine, data on cumulative revenues from the MS for the entire period of its operation were processed, which made it possible to determine the real share of the levy in covering defence needs and to assess its ability to act as an autonomous source of financing through a quantitative comparison of these volumes with direct expenditures for financing the Ministry of Defence of Ukraine. The next element was an assessment of the gap between accruals and actual payments based on budget classification indicators from the results of annual declarations, where a hidden budget deficit caused by late payments or undeclared income was identified by comparing accrued amounts and

actual revenues. At the same time, the dynamics of the accumulation of arrears in social security contributions were studied, and the phenomenon of rapid growth in overpayments under the relevant KKDB was examined, which made it possible to prove the relationship between debt growth and imperfect administration procedures, particularly in cases of erroneous payment of fees during notarial transactions. An important place was given to modelling the fiscal effect of changes in the tax burden, within which the forecast revenues were calculated in connection with the entry into force of new legislative norms on increasing rates and expanding the circle of payers at the expense of individual entrepreneurs. At the end of the stage, an analysis of the effectiveness of control and verification work was carried out using the results of audits by the Accounting Chamber, which made it possible to assess the practice of writing off bad debts and establish a direct correlation between the quality of administration by the territorial bodies of the State Tax Service and the volume of the deficit in revenues to the state budget.

3. A comparative analysis will be conducted on military and defence-related taxes used in other countries (e.g., Israel, the U.S., Germany). This will help assess the Ukrainian tax model in the context of international approaches and identify best practices.

The fifth stage of the study aims to conduct a comparative analysis of military and defence taxes applied in global practice (particularly in Israel, the United States and Germany) in order to assess the Ukrainian taxation model in the context of international approaches. This stage analyses various mechanisms for mobilising financial resources for defence needs, which allows identifying the most effective tax base structures and rates, as well as examining the practice of 'solidarity taxes'. Comparative analysis provides a scientific basis for identifying the best global practices for the targeting and administration of funds, which is critical for justifying the reform of the MT in Ukraine. Studying foreign experience allows for the adaptation of proven tools for ensuring fiscal transparency, in particular through the creation of specialised defence funds, which will contribute to increasing the efficiency and legal clarity of the national tax system in a state of martial law.

An analysis of international standards and practical experience in levying military and defense taxes also became the conceptual basis for the formation of alternative models, which were subsequently evaluated by experts. A summary of foreign approaches made it possible to identify key institutional elements (progressive rates, targeted allocation of funds, special defense funds, transparency mechanisms), which were integrated into the proposed alternatives for further multi-criteria analysis.

4. An expert survey will be conducted among representatives of local self-government bodies and financial departments of military units. The goal is to gather professional opinions on administrative efficiency and to minimise subjectivity in evaluating the challenges of tax collection. The survey was conducted anonymously, with respondents filling out questionnaires by hand without the use of specialized software, due to the specific nature of the military sphere and restrictions on the processing of official information. Given the relatively small sample size and in order to comply with confidentiality principles, the generalized socio-demographic characteristics of the experts (age, gender, and other personal data) are not provided in the study.

4.1. During the expert survey, it was determined that additional experts needed to be selected in order to ensure a high level of professional competence in matters relating to the administration of military service and the assessment of its impact on the financial system.

The following criteria were developed for the selection of experts (representatives of local government bodies and financial departments of military units).

The criteria for selecting experts were differentiated depending on their membership in the relevant professional group. For representatives of local self-government bodies, the emphasis was placed on experience in budget planning and tax revenue analysis, while for heads of financial bodies of military units, the emphasis was placed on practical experience in calculating, withholding, and reporting military levies in the financial support system of military units.

Selection criteria for Group 1 experts – representatives of local government bodies.

G1 – work experience in the field of local budgeting:

up to 1 year – 0 points;

1 to 3 years – 1 point;

3 to 5 years – 2 points;

more than 5 years – 3 points.

G2 – participation in local budget planning or implementation:

directly involved – 3 points;

partially involved – 1 point;

not involved – 0 points.

G3 – experience in tax and fee administration at the local level:

has practical experience – 3 points;

partially involved – 1 point;

no experience – 0 points.

G4 – level of awareness of international standards and best practices in the field of tax collection:

high level – 3 points;

sufficient level – 1 point;

no knowledge – 0 points.

Selection criteria for experts in group 2 – heads of financial departments of military units.

M1 – length of service (work) in the field of financial support for military units:

up to 1 year – 0 points;

from 1 to 3 years – 1 point;

from 3 to 5 years – 2 points;

more than 5 years – 3 points.

M2 – direct participation in the calculation, withholding and transfer of MT from the monetary support of military personnel and employees:

performs continuously – 3 points;

involved partially – 1 point;

does not perform – 0 points.

M3 – experience in assessing the impact of changes in tax legislation (in particular, rate increases) on the socio-economic situation of military personnel and employees of military units:

has practical experience – 3 points;

has been involved in analysis on an occasional basis – 1 point;

has no experience – 0 points.

M4 – participation in the preparation of reports, certificates or analytical materials on taxes and payments:

performs constantly – 3 points;

involved partially – 1 point;

does not perform – 0 points.

4.2 At the next stage of the study, the results of the respondents' self-assessment were summarised in order to determine their overall level of professional competence and the appropriateness of their inclusion in the expert group. To this end, the final score for each candidate was calculated as the sum of the points received for the relevant criteria (G1–G4 for representatives of local government bodies; M1–M4 for heads of financial bodies of military units).

In order to ensure an adequate level of quality of expert assessments, a minimum passing threshold was set at no less than 60% of the maximum possible score for the relevant group. Respondents who did not reach the set level were not involved in further stages of the study.

In other words, the final sample included experts who scored at least 8 points out of a possible 12.

As a result of the selection procedure, a final expert sample was formed.

4.3 Within the framework of this stage of the study, five alternative models for reforming the MT were developed for further comparative multi-criteria analysis. The alternatives were identified taking into account the current regulatory framework, existing scientific approaches and expert proposals on possible ways to improve the mechanism for mobilising financial resources for the needs of the security and defence sector.

A1 – the current model with a single rate of 5% and the transfer of revenues to the general fund of the state budget, which reflects the status quo and is used as a baseline for comparison;

A2 – a model with a 5% rate, but with funds earmarked exclusively for a special defence fund in order to increase transparency and taxpayer confidence;

A3 – a model introducing a progressive tax scale depending on income level, aimed at strengthening the principle of social justice;

A4 – a model eliminating the effect of double taxation by adjusting the tax base or the mechanism of offsetting against personal income tax;

A5 – a combined model that combines elements of a progressive scale and the creation of a special defence fund, ensuring a balance between fiscal efficiency, social justice and institutional transparency (Zavadskas, E. K., Mardani, A., Turskis, Z., Jusoh, A., & Nor, K. M., 2016; Mirrlees, J. A., 1971).

4.4. Within the framework of this stage of the study, a system of criteria was developed for evaluating each of the identified alternatives for reforming military conscription. The criteria were selected taking into account the objectives of the study and the results of preliminary expert discussions.

The experts evaluated each alternative model according to the defined criteria, using a scale of 1 to 10, where 1 meant minimum compliance with the criterion and 10 meant maximum compliance. Assessment criteria:

C1 – Fiscal capacity and impact on the state budget (weight 0.25). This indicator determines the ability of tax reform to significantly increase potential budget revenues to cover the defence deficit. An analysis of Shubin V.'s work and data from the Accounting Chamber demonstrates the need for stable and predictable financial resources for the defence sector, minimising dependence on external donors, and whether a change in the base or rate (e.g. to 5%) would allow the necessary billions of hryvnia to be accumulated in a short period of time. Research by Soldatenko O. indicates that currently, the Armed Forces cover only 10-11% of defence expenditures. The reform should create a stable flow of income that does not depend on short-term market fluctuations. Priority is given to models that guarantee maximum filling of the “military fund” while maintaining fiscal predictability.

C2 – Tax burden on the population (weight 0.15). This parameter measures the direct increase in costs for the population and the impact on citizens’ purchasing power in conditions of inflation. Atamanchuk N. and Kasyanenko L. confirm a direct correlation between the increase in the VAT rate and the decline in the standard of living of the working population, determining the “endurance limit” of taxpayers, beyond which social exhaustion sets in. Not only is the percentage of withdrawal assessed, but also the psychological perception of the reduction in net wages. Preference is given to mechanisms for protecting minimum incomes or gradually introducing changes that allow households to adapt to new conditions.

C3 – Social justice and progressiveness (weight 0.15). The indicator measures the actual “ability to pay” of taxpayers. Ivanov B. and Andriushchenko O. argue that the introduction of a progressive scale significantly reduces economic inequality by placing the main burden on individuals with very high incomes, whether the reform burdens everyone equally or introduces higher rates for the wealthier

segments of the population. The ability to balance social distance in society during wartime is assessed. The implementation of the "the richer pay more" principle through a tax-free minimum or differentiated rates is key to social cohesion and obtaining a high rating.

C4 – Impact on business and economic activity (weight 0.10). This indicator reflects the stimulating or inhibiting effect of the reform on investment and overall business development. Demyanchuk M. and Koyfman A. warn that expanding the circle of VAT payers to include legal entities and sole proprietors may become a destructive factor for economic stability, increasing tax pressure to a level that threatens business closures and investment outflows. It is important to find a balance at which enterprises remain viable and continue to create jobs. Models that preserve tax incentives for the real sector and do not block the funds needed to upgrade production capacity are preferred.

C5 – Risks of shadowing and evasion of social security contributions (weight 0.15). This parameter determines the probability of salaries being moved into the "shadow" or the existence of mechanisms for their legalisation. The Accounting Chamber emphasises significant shortcomings in the control system and the need to strengthen monitoring of the completeness of accruals, analysis of the "marginal rate" after which evasion becomes more economically advantageous than honest payment. An effective reform is designed so that the administrative and reputational costs of evasion exceed the benefits of evasion. A low probability of growth in the shadow sector and the preservation of official revenues are criteria for a successful model.

C6 – Transparency and public trust (weight 0.10). This indicator assesses the level of public confidence in the targeted use of tax revenues for defence needs. During martial law, taxpayers' trust in the state directly affects their willingness to pay taxes and support reform, whether the model ensures transparency in the distribution of funds and public accountability for their use. Mechanisms of public control, a separate "military account" and regular publication of expenditure reports increase the legitimacy of the reform. Lack of transparency provokes social tension and increased evasion even at moderate rates. Trust is a "soft" factor that significantly affects the actual effectiveness of collection.

C7 – Administrative simplicity and administration costs (weight 0.05). This indicator measures the technical complexity of implementing the reform and the burden on the State Tax Service, accountants and employers. The Accounting Chamber notes that complex control procedures require additional budgetary resources, changes in the number of reports, technical complexity of calculations, and overall administration costs for the state. An effective model can be easily integrated into existing processes (e.g., through withholding at source) without radically restructuring the tax service's IT systems. Minimal costs for collecting one hryvnia of tax are a sign of rational reform design.

C8 – Legal certainty and compliance with international standards (weight 0.05). This parameter analyses the quality of the legislative consolidation of the reform and its harmonisation with international law. Kuzmenko Y. and Soldatenko O. point to the need to eliminate the legal conflict between the name "levy" and the actual essence of the "tax", compliance with OECD and EU principles of transparency, non-discrimination, and predictability of tax legislation. The stability of the reform against legal challenges and its clarity for international financial institutions are critical factors. The absence of legal loopholes in the Tax Code guarantees stability for a long period and prevents legal conflicts between taxpayers and the state.

The assessment was carried out on a scale of 1-10, where 10 is the maximum compliance with the criterion.

4.5. Verification of the consistency of expert assessments. Given that the formation of a decision matrix within the framework of multi-criteria analysis is based on subjective expert assessments, there is a risk of logical inconsistencies or contradictions in judgments due to different professional experience, interpretation of criteria, or assessment errors, even taking into account the filtering of experts. To minimize the impact of such factors and increase the reliability of the

results, the consistency of expert assessments was verified. For this purpose, Kendall's concordance coefficient (W) was used, which allows assessing the degree of consistency of the opinions of several experts when ranking the same set of alternatives according to specified criteria. The value of the W coefficient varies from 0 to 1, where 0 means a complete lack of consistency and 1 means complete unanimity among experts. The use of this indicator makes it possible to quantitatively assess the level of consistency in the expert group and to conclude on the suitability of the obtained assessments for further use in the TOPSIS procedure (Kendall, M. G., & Moran, P. A. P., 1973).

The calculation algorithm involved forming a table of ranks based on expert assessments of alternatives, calculating the sums of ranks for each alternative, determining deviations from the mean value, and calculating the corresponding statistics, taking into account possible identical ranks. In case of insufficient consistency, it was possible to review the composition of the expert group or clarify the wording of the criteria.

Within the study, a Kendall's W concordance coefficient value of ≥ 0.6 was accepted as an acceptable level of consistency of expert assessments, which corresponds to a medium to high level of consensus in the expert group and allows the assessments to be considered sufficiently consistent for further use in multi-criteria analysis.

The statistical significance of the obtained W value was checked using the χ^2 criterion. The calculated χ^2 value was calculated using the corresponding formula and compared with the tabulated χ^2 value at a significance level of $\alpha = 0.05$ and the corresponding number of degrees of freedom (n–1). If the calculated χ^2 value exceeded the tabulated value, the consistency of expert assessments was considered statistically significant, and the results obtained were suitable for further use in the TOPSIS procedure.

4.6. The next stage of the methodological procedure was to determine the weight coefficients for each of the criteria for evaluating alternatives. Theoretically, it is possible to use objective methods for determining weights, in particular the entropy approach, but given the specifics of the study and the importance of the professional experience of experts, an expert method of ranking criteria was chosen.

The weight coefficient of each criterion was determined based on the total assessment (ranks) provided by experts, using the following formula:

$$a_i = \frac{S_i}{\sum S_i}, \sum_{i=1}^{n} a_i = 1 \quad (1)$$

where: a_i – weight coefficient of the *i*-th criterion;
S_i – sum of ranks assigned by experts to the corresponding criterion;
n – total number of criteria.

Normalizing weights to unity ensures the correct distribution of criteria within the model and prevents their excessive or insufficient representation in the TOPSIS procedure. This approach is typical for multi-criteria decision analysis methods and allows preserving the internal logic of the model and the consistency of results.

5. The TOPSIS method will be employed to assess and rank alternative reform models of military tax. A decision matrix will be constructed using predefined criteria and weights, followed by proximity calculations to identify the most effective and balanced reform option.

The TOPSIS method is a universal tool for multi-criteria decision analysis that allows you to justify the choice of the best alternative by comparing its distances to the conditional positive and negative ideal solutions (Ministry of Finance of Ukraine, 2025a). The logic of the method is to identify the alternative that is closest to the ideal and furthest from the worst.

The method includes the following sequential steps:

1. Formation of a matrix for evaluating alternatives according to criteria.

2. Normalisation of data.
3. Application of weighting coefficients.
4. Determination of positive and negative ideal solutions.
5. Calculation of distances to them.
6. Calculation of the proximity index (Ci).
7. Ranking of alternatives.

$$R_{ij} = \frac{x_{ij}}{\sqrt{\sum_{i=1}^{m} x_{ij}^2}}, \quad (2)$$

where: R_{ij} – normalized value of alternative *i* according to criterion *j*;
x_{ij} – initial value (score from 1 to 10) of alternative i according to criterion *j* from the initial table;
m – number of alternatives;
$\sum_{i=1}^{m} x_{ij}^2$ – sum of squares of all ratings for a specific criterion j for all alternatives.

$$V_{ij} = W_j * R_{ij}, \quad (3)$$

where: V_{ij} – is the weighted normalised value;
W_j – weight coefficient (weight) of criterion *j*.

$$S^+ = \sqrt{\sum_{j=1}^{n} \left(V_j^+ - V_{ij}\right)^2}, \; S^- = \sqrt{\sum_{j=1}^{n} \left(V_j^- - V_{ij}\right)^2} \quad (4)$$

where: S^+ – distance to the positive ideal solution (the best possible result).
S^- – distance to the negative ideal solution (the worst possible outcome).
V_j^+ – the best weighted value among all alternatives according to criterion *j*.
V_j^- – the worst weighted value among all alternatives according to criterion *j*.

$$C_i = \frac{S_i^-}{S_i^+ + S_i^-} \quad (5)$$

where: C_i – proximity index. The closer this value is to 1, the better the model;
S_i^- – distance to the worst solution;
S_i^+ – distance to the best solution.

6. To assess the robustness of the multi-criteria ranking outcomes, a comprehensive sensitivity analysis was conducted. Since the TOPSIS method relies on expert-derived weight coefficients, potential variability in weights may influence the final ranking structure. To address this issue, three complementary approaches were applied: One-at-a-Time (OAT) weight variation, scenario-based priority adjustment, and stochastic Monte Carlo simulation.

The OAT procedure involved varying each criterion weight by ±10%, followed by renormalization and recalculation of closeness indices. The results demonstrated full stability of the leading alternative. Scenario-based analysis revealed that shifts in strategic priorities (fiscal or social emphasis) only alter the ranking within the two strongest alternatives (A5 and A4), indicating their structural proximity. Additionally, Monte Carlo simulation (5,000 iterations, σ = 0.15) confirmed a high level of robustness: first place is distributed exclusively between the two dominant models, while other alternatives never achieve dominance. Overall, the findings demonstrate statistical and structural stability of the results under moderate weight uncertainty.

At the final stage, the research findings were synthesized in order to formulate final conclusions and substantiate the optimal reform scenario.

Results

1. The MT is a unique tax instrument that was intended to combine elements of direct taxation of personal income and a special purpose payment. Its introduction in 2014 was driven by the urgent need to finance the state's defence capabilities in the context of armed aggression, but the temporary nature of the levy has since transformed into a permanent component of the tax system. On 1 January 2015, the law extended the term of the MT indefinitely: the levy will remain in effect until the Verkhovna Rada of Ukraine adopts a decision on the completion of the reform of the Armed Forces of Ukraine. Despite this, the legal status of the MT is still enshrined in the "Transitional Provisions" section of the Tax Code of Ukraine, which contradicts the systematic principle of codification of tax rules and causes legal uncertainty.

The formal name "military levy" conflicts with the definition of "levy" in paragraph 6.2 of Article 6 of the Tax Code of Ukraine, where "levy" means a mandatory payment for receiving a special benefit. The MT does not provide the payer with such a special benefit, so its economic nature is closer to the national personal income tax (PIT). In addition, MT revenues are credited to the general fund of the State Budget, which does not correspond to the targeted nature of the tax and makes it impossible to control the targeted use of the amounts paid. The exclusion of the MT from Articles 9–10 of the Tax Code, which define the list of national and local taxes and fees, confirms its temporary nature. The object of taxation by MT actually duplicates the categories of income defined for personal income tax: wages, remuneration under civil law contracts, foreign income, dividends, and transactions with crypto assets. This supports the argument that this payment is purely tax-related in nature, rather than a "levy" in the traditional sense.

The problem with comprehensive taxation of a single object is the lack of a mechanism for mutual deduction of these payments, which creates the effect of double taxation. Since PIT and MT are calculated in parallel from the same base of the taxpayer's total monthly income, a situation arises in which the identical economic result of a person is subject to multiple fiscal impacts.

The increase in the MT rate from 1.5% to 5% in December 2024 significantly increased the total tax burden on citizens' incomes. Combined with personal income tax (18%), the total burden on an identical taxable object now reaches 23%, which raises the issue of reforming the system and revising the tax base in order to comply with the principle of social justice.

2. Legislative amendments adopted in 2024–2025 substantially transformed the functional role of the MT within the Ukrainian tax system. Law No. 4015-IX of 10 October 2024 increased the general MT rate for most individuals from 1.5% to 5%, with the provision entering into force on 1 December 2024. The introduction of MT obligations for sole proprietors, as well as certain reporting and payment procedures, was deferred until 1 January 2025.

Under the new framework, sole proprietors in groups I, II, and IV are subject to a fixed monthly payment amounting to 10% of the minimum wage (for 2025 – UAH 800 per month based on a minimum wage of UAH 8,000), while group III taxpayers are required to pay 1% of income for the reporting period. At the same time, the rate for military personnel and certain security sector employees remains at 1.5%, and income received by individuals directly involved in defence activities is exempt from the levy in accordance with the transitional provisions of the Tax Code of Ukraine.

Despite the fiscal strengthening effect of these amendments, several legal and administrative challenges remain. These include the application of the revised rates to income accrued prior to the entry into force of the law (raising issues of retroactivity and recalculation), the interaction between the military levy, personal income tax, and the unified social contribution, and the procedural aspects of administration following the transition to consolidated monthly reporting.

Although the State Tax Service issued regional and central clarifications regarding payment procedures and deadlines, practical difficulties persisted, particularly in relation to transitional

calculations. Therefore, while the 2024–2025 reforms significantly enhanced the fiscal capacity of the MT as a tool for mobilising domestic resources for defence, they simultaneously intensified legal inconsistencies and highlighted the need for further harmonisation with other tax and social contributions in order to ensure legal certainty, transparency, and predictability in tax administration.

Table 1: Volumes of military levy revenues in the structure of the Consolidated Budget of Ukraine during 2014–2021, thousand UAH

Year	Tax revenues to the Consolidated Budget of Ukraine, thousand UAH	Volumes of military levy revenues in the structure of the Consolidated Budget of Ukraine, thousand UAH
2014	367,511,931.10	2,534,661.90
2015	507,635,899.70	9,153,976.70
2016	650,781,678.60	11,457,211.50
2017	828,158,813.90	15,067,038.60
2018	986,348,500.00	18,723,500.00
2019	1,070,321,800.00	22,425,500.00
2020	1,136,687,200.00	23,929,500.00
2021	1,453,804,100.00	28,608,800.00

***Source**: summarised by the authors based on (Ministry of Finance of Ukraine, 2025b)*

It should be noted that an analysis of the dynamics of MT revenues during 2014–2021 shows an increase in its volume to the budget. This means that in reality, the MT finances not the defence sector, but general state functions, including social spending, education and healthcare.

Despite the statistical growth in MT revenues, the Accounting Chamber reports that MT arrears to the state budget increased by UAH 94.7 million as of 1 January 2023 (from UAH 278 million to UAH 372 million compared to 2020). At first glance, this appears to contradict the upward revenue trend; however, a more detailed analysis reveals several structural factors behind this dynamic.

One key reason is the administrative time lag inherent in the declaration system. Revenues under the annual declaration code (11011001) are recorded with a significant delay relative to accrual, as taxpayers submit declarations by 1 May of the following year. Consequently, arrears accumulate in the period between tax accrual and actual payment.

Another factor is the limited payment capacity of certain taxpayers and the underreporting of income. During 2020–2022, PIT accruals frequently exceeded actual receipts. For example, in 2020 UAH 33.7 billion was accrued, while only UAH 23.9 billion was collected, resulting in a gap of UAH 9.7 billion.

An additional issue concerns the write-off of uncollectible debt. According to the Accounting Chamber, territorial bodies of the State Tax Service wrote off UAH 37.5 million in arrears during 2020–2022, including UAH 21.2 million in 2020, UAH 15.3 million in 2021, and UAH 4.7 million in 2022. The largest write-offs due to the expiration of the statute of limitations occurred in the Main Department of the State Tax Service in Kyiv, as well as in the Vinnytsia and Dnipropetrovsk regions.

At the same time, overpayments have increased significantly: their volume rose from UAH 1.0 billion in 2018 to UAH 2.0 billion in 2023. The most notable growth occurred under declaration code 11011001, where overpayments increased 3.3 times. This often results from erroneous payments made during notarised transactions by taxpayers who were not required to submit declarations.

Finally, part of the arrears accumulation can be attributed to deficiencies in enforcement procedures. For instance, in 2020 the Main Department of the State Tax Service in the Dnipropetrovsk region failed to take timely measures to recover debts from 14 taxpayers (UAH 764.5 thousand) and did not initiate legal proceedings for three years. Similarly, the Main Department of the State Tax Service in the Vinnytsia region violated statutory deadlines for issuing tax claims, with delays ranging from 10 to 39 days (Accounting Chamber of Ukraine, 2023).

Table 2: Defence Expenditures of Ukraine and Their Share in the State Budget (2014–2025)

Year	Expenditures (thousand UAH)	Percentage of budget
2014	27 365 464	6.3
2015	52 015 770,7	9.01
2016	59 359 144,5	8.67
2017	74 360 390,7	8.86
2018	97 024 100	9.84
2019	106 627 800	9.94
2020	120 374 100	9.35
2021	127 527 000	8.56
2022	1 113 343 440,4	42.24
2023	2 066 520 986,6	52.25
2024	2 229 133 474,8	51.36
2025	3 001 894 418,7	52.7

***Source**: summarised by the authors based on data from the Ministry of Finance (Ministry of Finance of Ukraine, 2025a)*

According to the statistical data provided, it can be understood that MT accounts for only 10-11% of defence expenditures under budget classification code 0200.

The economic dynamics of revenues show significant growth: while in 2014 the budget received only UAH 2.5 billion, in 2022 it will receive UAH 33.7 billion, and a total of UAH 165.6 billion for 2014-2022. According to the Accounting Chamber, the debt on MT payments increased from UAH 278 million in 2020 to UAH 372 million at the beginning of 2023, which indicates shortcomings in administration and control.

An important stage in the development of the legal mechanism for MT was the changes adopted by Law No. 4015-IX of 10 October 2024, which came into force on 1 December 2024. This law increased the MT rate for individuals from 1.5% to 5%, and from 1 January 2025, mandatory payments for sole proprietors are to be introduced: for groups I, II and IV – a fixed amount of 10% of the minimum wage, and for group III payers – 1% of income for the reporting period. At the same time, military personnel directly involved in combat operations are exempt from paying the levy, which ensures social justice and moral balance in the taxation system. After the rate was increased to 5% in 2024–2025, there was a so-called “financial leap”: in the first five months of 2025 alone, revenues amounted to UAH 61.6 billion, which is almost four times higher than the previous year (Cabinet of Ministers of Ukraine, 2025, June 10). This indicates a sharp increase in the role of VAT in shaping the revenue side of the budget, but at the same time raises the issue of the social burden on the population.

In conclusion, the dynamics of MT revenues indicate that, with the right legislative and administrative approach, it can become one of the key mechanisms for mobilising resources in wartime. However, in order to achieve real effectiveness, it is necessary to solve the problem of targeted use of funds, optimise administration, ensure coordination with other taxes, and introduce control and public reporting mechanisms.

The problem of double taxation is due to the fact that both the MT and the unified social tax are determined on the basis of total income. Double taxation occurs when the same or similar tax is levied on the same taxable object of an individual taxpayer for the same period of time.

The MT is regulated by subparagraph 1.2 of paragraph 16-1 of subsection 10 of section XX "Transitional Provisions" of the Tax Code of Ukraine. The object of taxation by the tax largely coincides with the object of PIT, with the exception of certain categories of income. This situation creates the effect of internal legal double taxation, since the same taxpayer pays two tax payments that are different in name but identical in essence from one object of income in monetary or non-monetary form.

This phenomenon is due to the imperfection of national legislation, in particular the lack of clear codification of the MT in the structure of the Tax Code and the mechanism for reconciling the tax bases of PIT and the levy. Currently, the MT in its present form falls under the definition of legal double taxation, which leads to a cumulative increase in fiscal pressure and requires legislative regulation to ensure tax fairness.

The key problem is the lack of a mechanism to reduce the MT base by the amount of personal income tax already accrued or to apply similar tax deductions to it. In fact, the MT is levied on the taxpayer's total gross income, ignoring the principles of forming the personal income tax base, which provides for certain adjustments. This confirms the existence of a structural imbalance: part of the income, which in the personal income tax system may be subject to benefits or exemptions, is fully taxed in the MT system.

The increase in the MT rate from 1.5% to 5% in December 2024 led to a more than threefold increase in the fiscal impact on this common tax base. While the total burden was relatively moderate before, at the current rate it accounts for a significant share of the overall tax burden on citizens' income, highlighting the need for immediate harmonization of the tax bases for both payments.

3. An analysis of global financial history shows that the introduction of special tax instruments during periods of military conflict or large-scale security threats is a justified and common mechanism for fiscal resource mobilisation. The practice of many countries confirms that in the event of war or emergencies, states often resort to introducing temporary military levies to cover critical expenses.

The most relevant contemporary example is the experience of Israel, where, in conditions of constant military threats, the government systematically uses the mechanism of additional security levies or adjusts income tax rates depending on the intensity of defence operations. The experience of the United States is also historically significant, where during the First and Second World Wars, special 'war taxes' (War Revenue Act) were in effect, providing for a significant increase in tax rates. In addition to direct taxation, the United States actively used the instrument of 'war bonds,' attracting funds from the population on the basis of interest-bearing returns, which allowed for the diversification of sources of defence revenue.

Similar fiscal policy strategies were observed in other developed countries: during World War II, Canada introduced a special 'Victory Tax' aimed exclusively at financing military operations, and Germany used an extraordinary war tax in the post-World War I period to stabilise the economy and cover losses. In the current European context, against the backdrop of Russia's full-scale invasion of Ukraine, the trend towards increased defence spending has become relevant for the Baltic countries. Lithuania, Estonia and Latvia have not only significantly increased their respective budget expenditures, but have also begun discussions on the introduction of targeted 'defence taxes,' which are currently being actively debated in Lithuanian society.

At the same time, despite the existence of numerous international analogues, the Ukrainian case of military taxation has certain specific features that set it apart from the general background. Ukraine is not the only country to have introduced such an instrument, but its continued existence as a 'temporary' measure (since 2014) and the recent increase in the rate to 5% is quite an exceptional step by modern global standards. While in most countries such measures are short-term and reactive in nature, in Ukraine the MT has become a permanent and significant element of

the tax system, requiring a particularly careful approach to its legislative regulation and ensuring transparency in the use of the accumulated funds.

The MT in Ukraine is analogous to wartime taxes known in global practice. The 5% rate is comparable to other countries, in particular Germany and Japan.

To ensure the legitimacy of the tax increase, it is necessary to ensure transparent reporting on the use of funds and a flexible mechanism for reviewing rates. An institutional approach to the military taxation model based on the principles of solidarity, temporariness and targeting is important.

4. Based on the results of the initial selection, a preliminary sample of 16 experts was formed, including representatives of local self-government bodies and heads of financial departments of military units of the Armed Forces of Ukraine. The selection was carried out in accordance with the developed criteria of professional competence and experience in the field of budget planning and administration of military recruitment.

After applying the established passing threshold (at least 8 points out of a possible 12), additional filtering of respondents was carried out. As a result, the final expert group consisted of 12 people who demonstrated an adequate level of knowledge and experience sufficient for further multi-criteria analysis.

Based on the survey results, a structured database of expert assessments was created, containing scores assigned to each alternative in accordance with the established criteria. This database served as the basis for constructing a decision-making matrix and conducting further multi-criteria analysis.

The expert assessments obtained were transformed into a ranking form. For each expert separately, the criteria were ranked from 1 to 8 according to their importance: the least important received rank 1, the most important received rank 8. In cases where an expert gave the same ratings to several criteria, they were assigned an average rank in accordance with the standard procedure for processing tied ranks. Based on this, a ranking table was formed, which was used for further calculation of Kendall's concordance coefficient (table 3).

The analysis revealed the presence of tied ranks among most experts. The total number of groups of identical ratings (ties) for all 12 experts was 32, and the total value of the correction for tied ranks was T=210. The presence of repeated ratings is due to the use of a discrete scale of 1–10 and the proximity of the values of individual criteria according to the subjective perception of experts.

Table 3: Results of the analysis of the consistency of expert assessments of the criteria

№	Title	Total score	Ranking form
C1	Fiscal capacity and impact on the state budget	101	95
C2	Tax burden on the population	60	65,5
C3	Social justice and progressiveness	61	66,5
C4	Impact on business and economic activity	40	44
C5	Risks of shadowing and evasion of social security contributions	59	67,5
C6	Transparency and public trust	41	49
C7	Administrative simplicity and administration costs	21	22,5
C8	Legal certainty and compliance with international standards	20	22

***Source**: prepared by the authors*

The ranks obtained for each criterion allow us to proceed to a quantitative assessment of the consistency of expert judgements. Based on the formed table of ranks, the deviation of each sum of ranks from their average value was calculated and the sum of squares of these deviations was determined. Taking into account the correction for tied ranks (the presence of identical assessments within individual experts), Kendall's concordance coefficient was calculated.

The next stage involves checking the statistical significance of the obtained consistency coefficient using the χ^2 (chi-square) criterion, which allows us to conclude on the adequacy of the level of consensus in the expert group. The results of the corresponding calculations are presented in table 4.

Table 4: Assessing the consistency of comparisons using the concordance coefficient

Title	K1	K2	K3	K4	K5	K6	K7	K8	K9
Sum of marks	95	65,5	66,5	44	67,5	49	22,5	22	95
Average amount	54								
Quartile deviation	1681,00	132,25	156,25	100,00	182,25	25,00	992,25	1024,00	1681,00
Concordance coefficient	0,73535								
Weighting coefficient of criteria	0,25	0,15	0,15	0,10	0,15	0,10	0,05	0,05	0,25
Pyroson's criterion	61,77								
x2 table	14,07								

***Source**: prepared by the authors*

In order to correctly determine the concordance coefficient, the presence of tied ranks (identical ratings within one expert) was taken into account. For each expert, a correction was calculated, defined as the sum of the expressions ($t3-t$) for each group of identical ratings, where t is the number of criteria with the same value for the respective expert. The total correction for all 12 experts was T=210, which was taken into account in the denominator of Kendall's concordance coefficient formula.Based on the calculated sum of ranks and taking into account the correction for tied ranks, the concordance coefficient W=0.73535 was obtained, which indicates a high level of expert agreement. The χ^2 criterion was used to verify the statistical significance of the result. The calculated value χ^2=61.77 at 7 degrees of freedom exceeds the tabulated value. Thus, the consistency of expert judgements is statistically significant, which confirms the reliability of the formed decision matrix and the possibility of further use of the obtained estimates in the TOPSIS procedure (table 5).

5. Based on expert assessments, an initial decision matrix was formed for comparative analysis of alternatives for reforming military conscription. The table shows the average scores for each alternative according to specific criteria, taking into account the corresponding weighting coefficients, which formed the basis for further application of the TOPSIS method.

Table 5: Initial matrix for evaluating alternatives

Alternative	C1 (0.25)	C2 (0.15)	C3 (0.15)	C4 (0.10)	C5 (0.15)	C6 (0.10)	C7 (0.05)	C8 (0.05)
A1	9	2	2	3	4	2	10	8
A2	9	3	2	4	5	10	9	7
A3	6	8	10	6	7	8	4	6
A4	7	9	7	9	8	7	7	9
A5	8	10	10	8	10	10	2	5

***Source:** prepared by the authors*

Thus, the expert survey was conducted in two stages. At the first stage, experts assessed the importance of specific criteria in order to form weighting coefficients reflecting their priority in the structure of multi-criteria analysis. At the second stage, the same experts evaluated the proposed

alternatives for reforming the military draft according to the established criteria, which made it possible to form an initial decision matrix for further application of the TOPSIS method.

To assess the consistency of expert evaluations of the alternatives under each criterion, Kendall's coefficient of concordance (W) was applied. Since the evaluation was conducted by 12 experts across 5 alternatives, the coefficient was calculated separately for each of the eight criteria. The obtained values of W ranged from 0.647 to 0.974, indicating a moderate to high level of agreement among the experts.

The statistical significance of the concordance was tested using the chi-square (χ^2) criterion with 4 degrees of freedom (n–1 = 5–1). In all cases, the calculated χ^2 values exceeded the critical value $\chi^2_{0.05;4} = 9.488$, confirming that the level of agreement is statistically significant at $\alpha = 0.05$. Therefore, the results of the second stage of the expert survey can be considered sufficiently consistent and appropriate for further application of the TOPSIS method.

The next stage of the study, according to the chosen methodology (Yildirim, J., Sezgin, S., & Öcal, N., 2005), was to standardize the constructed decision matrix. This made it possible to bring heterogeneous indicators to a comparable form and form a normalized matrix R. Analysis of the obtained normalized values allows us to trace the strengths and weaknesses of each alternative according to the specified criteria (C1 – C8). In particular, the current model (A1) is characterized by high values for criteria corresponding to the current administration order (C7 – 0.632), but it demonstrates the lowest level of compliance with the criterion of social justice (C2 – 0.188). In contrast, the combined model (A5) demonstrates the highest normalized scores for the criteria of social justice (C2 – 0.563) and fiscal efficiency (C3 – 0.568), confirming its potential as the most balanced scenario. Alternatives A3 and A4 have median values (between 0.36 and 0.54) for most parameters (C4 – C6), indicating their moderate effectiveness, while model A2 (creation of a special fund) shows a consistent advantage in terms of the targeted use of funds.

Table 6: Weighted normalised matrix V

Alternative	C1 (0.25)	C2 (0.15)	C3 (0.15)	C4 (0.10)	C5 (0.15)	C6 (0.10)	C7 (0.05)	C8 (0.05)
A1	0.1235	0.0282	0.0284	0.058	0.0407	0.0332	0.0316	0.0251
A2	0.1235	0.0845	0.0378	0.0435	0.0509	0.0332	0.0285	0.0219
A3	0.0928	0.0657	0.0852	0.0363	0.0711	0.0531	0.0127	0.0188
A4	0.108	0.0563	0.0758	0.0508	0.0813	0.0465	0.0222	0.0282
A5	0.108	0.0845	0.0852	0.029	0.0813	0.0531	0.0064	0.0157

Source: *prepared by the authors*

The next step, according to the research methodology, was to determine the weighted normalized values. To do this, all the normalized data obtained at the previous stage were multiplied by the corresponding weight coefficients of the criteria using formula V_{ij} (2).

The best alternative (S+) and the worst alternative (S-) are determined according to the weighted decision matrix using formula (3) in accordance with the methodology. For each competitive alternative, the relative proximity of the potential location to the ideal solution was calculated using formula (4) in accordance with the methodology (Hwang, C. L., 2014).

The application of the TOPSIS method enabled the integration of eight evaluation criteria encompassing fiscal capacity, social justice, transparency, administrative feasibility, and legal certainty in the assessment of alternative MT reform models. The results of the decision matrix indicate that the combined model A5 (progressive taxation combined with a targeted defence fund) achieved the highest closeness coefficient (C_i = 0.6827), demonstrating the most balanced performance across the selected criteria.

Model A4 (elimination of the double taxation effect through adjustment of the tax base) ranked second with a marginal difference (C_i = 0.6813). Its performance reflects a high degree of legal consistency, tax fairness, and economic neutrality. The minimal gap between A5 and A4

indicates the presence of two structurally competitive reform options, differentiated primarily by their emphasis on fiscal mobilisation versus legal harmonisation.

Table 7: Ideal solutions, distances S^+, S^- and proximity index C_i

Alternative	S+	S−	C_i
A	0.0919	0.0501	0.3526
A2	0.0619	0.071	0.5344
A3	0.0481	0.0778	0.6179
A4	0.0362	0.0773	0.6813
A5	0.0433	0.0931	0.6827

Source: *prepared by the authors*

The progressive rate model A3 (C_i = 0.6179) ranked third, exhibiting strong distributive characteristics but comparatively weaker administrative simplicity and implementation feasibility. Model A2 (fixed 5% rate combined with earmarked allocation) improved transparency and institutional trust; however, its overall closeness coefficient (C_i = 0.5344) remained limited due to insufficient differentiation of the tax burden. The current model A1 showed the lowest proximity to the ideal solution (C_i = 0.3526), suggesting that maintaining the status quo under prolonged wartime conditions yields the least balanced outcome in terms of fiscal effectiveness and social legitimacy.

6. To evaluate the robustness of the obtained ranking results, a One-at-a-Time (OAT) weight sensitivity analysis was conducted. This approach involves individually varying each criterion weight by ±10%, followed by renormalization of the weight vector and recalculation of TOPSIS closeness coefficients. Such a procedure enables the assessment of local robustness and determines whether moderate variations in expert-assigned weights influence the final ranking of alternatives.

Table 8: One-at-a-Time (OAT) Weight Sensitivity Analysis (±10% variation)

Criterion	Weight Change	Top-1 Alternative	Full Ranking
C1	+10%	A5	A5 > A4 > A3 > A2 > A1
C1	−10%	A5	A5 > A4 > A3 > A2 > A1
C2	+10%	A5	A5 > A4 > A3 > A2 > A1
C2	−10%	A5	A5 > A4 > A3 > A2 > A1
C3	+10%	A5	A5 > A4 > A3 > A2 > A1
C3	−10%	A5	A5 > A4 > A3 > A2 > A1
C4	+10%	A5	A5 > A4 > A3 > A2 > A1
C4	−10%	A5	A5 > A4 > A3 > A2 > A1
C5	+10%	A5	A5 > A4 > A3 > A2 > A1
C5	−10%	A5	A5 > A4 > A3 > A2 > A1
C6	+10%	A5	A5 > A4 > A3 > A2 > A1
C6	−10%	A5	A5 > A4 > A3 > A2 > A1
C7	+10%	A5	A5 > A4 > A3 > A2 > A1
C7	−10%	A5	A5 > A4 > A3 > A2 > A1
C8	+10%	A5	A5 > A4 > A3 > A2 > A1
C8	−10%	A5	A5 > A4 > A3 > A2 > A1

Source: *prepared by the authors*

The results indicate complete ranking stability under ±10% perturbations of each individual criterion weight. In all tested cases, alternative A5 retains the leading position, and the overall ranking structure remains unchanged. This confirms a high degree of local robustness of the TOPSIS model and demonstrates that the results are not critically dependent on minor variations in weight specification. Therefore, the findings may be considered reliable with respect to reasonable uncertainty in expert weight assessments.

Furthermore, an extended sensitivity assessment was performed Python within the Google Colab environment. The numerical procedures were carried out using the NumPy library for matrix operations and vectorized calculations, while Pandas was applied for structured data processing and tabular result representation. The Monte Carlo procedure involved stochastic perturbation of the baseline weight vector under lognormal distribution assumptions, repeated recalculation of TOPSIS scores across 5,000 simulations, and estimation of ranking stability frequencies.

Table 9: Scenario-Based Weight Sensitivity

Scenario	Resulting Ranking
Baseline	A5 > A4 > A3 > A2 > A1
Fiscal Emphasis (C1 increased)	A5 > A4 > A3 > A2 > A1
Social Emphasis (C3 increased)	A4 > A5 > A3 > A2 > A1
Equal Weights	A4 > A2 > A3 > A5 > A1

Source: *prepared by the authors*

The scenario-based analysis indicates that the baseline ranking remains unchanged under fiscal emphasis (increased weight of C1). However, a socially oriented weighting scheme (increased weight of C3) shifts the leading position to alternative A4. Under equal weighting, the ranking structure also changes. These findings suggest that the top positions are sensitive to priority adjustments, while the leading group of alternatives (A4 and A5) remains consistently dominant.

To further examine the robustness of the results, a stochastic sensitivity analysis using the Monte Carlo method was conducted. A total of 5,000 simulations were performed, applying lognormal perturbations to the baseline weight vector ($\sigma = 0.15$). For each simulated weight set, TOPSIS closeness coefficients were recalculated and the resulting rankings were recorded.

Table 10. Monte Carlo Sensitivity Analysis (5,000 simulations, $\sigma = 0.15$)

Alternative	Top-1 Frequency
A5	0.5054
A4	0.4946
A1	0.0000
A3	0.0000
A2	0.0000

Source: *prepared by the authors*

The Monte Carlo results demonstrate a high degree of structural robustness. Leadership is distributed exclusively between alternatives A5 (50.54%) and A4 (49.46%), while the remaining alternatives never attain the top position. This distribution indicates strong competitive proximity between the two leading alternatives under stochastic weight uncertainty, alongside complete stability of lower-ranked options. The findings confirm the robustness of the TOPSIS model and the absence of critical ranking instability.

Overall, the TOPSIS results provide structured quantitative support for systemic reform scenarios oriented toward progressive taxation mechanisms and targeted defence financing instruments. The dominance of models A5 and A4 indicates that future reform priorities should focus on balancing fiscal mobilisation capacity with principles of fairness and legal certainty.

Conclusion

The study demonstrates that the MT in Ukraine has evolved from a temporary anti-crisis measure introduced in 2014 into a structurally significant component of wartime public finance. Legislative amendments adopted in 2024–2025, including the increase of the rate to 5% and the expansion of the tax base to individual entrepreneurs, substantially strengthened its fiscal capacity. In the first five months of 2025 alone, revenues reached UAH 61.6 billion, confirming the levy's transformation

into a major domestic source of defence financing.

The application of the TOPSIS method enabled the integration of eight evaluation criteria encompassing fiscal effectiveness, social justice, transparency, administrative feasibility, and legal certainty. The consistency of expert judgments was statistically confirmed (Kendall's W = 0.735; χ^2 = 61.77 > χ^2critical), validating the reliability of the decision matrix.

Multi-criteria modelling results indicate that the combined reform model A5 (C_i = 0.6827) represents the most balanced alternative, combining a progressive taxation scale with the creation of a targeted defence fund. The minimal gap between A5 and model A4 (C_i = 0.6813) suggests the existence of two structurally strong reform scenarios: one prioritising fiscal mobilisation combined with distributive fairness, and the other focusing on eliminating double taxation and ensuring legal harmonisation. Robustness analysis confirmed the stability of the findings. The One-at-a-Time sensitivity test (±10% weight variation) did not alter the leading alternative. Monte Carlo simulation (5,000 iterations, σ = 0.15) further demonstrated structural stability: first place is distributed exclusively between A5 (50.54%) and A4 (49.46%), while other alternatives never achieve dominance.

The TOPSIS results showed that the advantage of alternatives A5 and A4 is not based on a single dominant criterion, but on a coordinated combination of key performance measures that have the greatest weight in the model. At the same time, A4 demonstrates almost identical proximity to the ideal (the C_i difference is minimal), which is interpreted as high "structural competitiveness" of the two approaches: A5 is stronger in the components of social justice/trust due to the institutional consolidation of the targeted fund, while A4 is stronger in legal certainty and tax fairness. Thus, TOPSIS identifies a possible list of optimal reforms from two similar options, the choice between which depends on current priorities.

Therefore, the TOPSIS assessment confirms the key conclusion: the effectiveness of military service reform is determined by a set of institutional and legal decisions.

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Competing interests

The authors declare that they have no competing interests.

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