

FINANCIAL RESILIENCE OF UKRAINE'S MUNICIPALITIES DURING THE RUSSIAN-UKRAINIAN WAR: EMPIRICAL EVIDENCE

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Abstract. Russia's war against Ukraine has intensified asymmetries in the socio-economic development of territories, thereby precipitating a radical transformation of the financial foundations underpinning the functioning of Ukraine's municipalities. This context necessitates the development of differentiated approaches to strengthening municipalities' financial resilience during both wartime and post-war periods. The purpose of this article is to assess the financial resilience of Ukrainian municipalities under conditions of war. The study employs the following research methods: a system-structural approach (to construct an information-analytical model of financial resilience), an integral assessment method (to develop an empirical indicator of municipal financial resilience), and a multiplicative approach (to construct a composite indicator of financial resilience). The information-analytical basis of the study comprises data from all municipalities of Ukraine, classified into four groups, for the period 2021–2025. The findings indicate a weakening in the financial resilience of Ukraine's municipalities during the full-scale invasion. In rear regions, the dynamics are heterogeneous: municipalities in Lviv Oblast maintained relatively high values, whereas those in Volyn Oblast deteriorated to 0.164 in 2025. Two distinct models of revenue autonomy are clearly observable: (1) a model of regional polarization (in 2023, frontline and occupied municipalities declined to critical levels—Kherson, Luhansk, and Zaporizhzhia Oblasts—while municipalities in Dnipropetrovsk (0.757), Kyiv (0.628), and Poltava (0.558) Oblasts preserved or strengthened their financial resilience potential); and (2) an adaptive model (by 2025, Kyiv (0.771), Poltava (0.760), and Dnipropetrovsk (0.754) Oblasts approached the optimal threshold (0.75), while Lviv (0.654), Cherkasy (0.601), and Kirovohrad (0.594) Oblasts entered the zone of permissible autonomy; municipalities in Luhansk Oblast continue to record zero values). Expenditure autonomy across municipalities in all regions of Ukraine systematically deteriorated throughout the entire period under study. The empirical evidence demonstrates that municipal financial resilience is characterized by internal structural disproportionality. Pronounced fiscal gaps persist, while investment activity remains selective.

Keywords: war, resilience, Ukraine, finance, local budgets, investment, municipalities, local self-government, assessment, debt.

JEL Classification: O18, E62, C40

1. INTRODUCTION

Russia's war against Ukraine has intensified asymmetries in the socio-economic development of territories, thereby precipitating a radical transformation of the financial foundations underpinning the functioning of Ukraine's municipalities. Since February 2022, the system of local public finance has evolved amid asymmetric security, economic, and demographic shocks, resulting in pronounced spatial

differentiation in municipalities' financial resilience. The escalation of security risks—along with their structure, depth, and duration—varies substantially by municipality type, necessitating differentiated policy approaches to strengthen municipal financial resilience during both wartime and post-war periods.

2. THEORETICAL BACKGROUND

The study of system resilience gained wide scholarly recognition following the publication by the ecologist–economist C. S. Holling (Holling, 1973) of the seminal work *Resilience and Stability of Ecological Systems*, in which the term “resilience” was used to interpret the capacity of an ecosystem with alternative attractors to persist within an equilibrium state under conditions of disturbance. The author’s approach was grounded in the need to preserve systemic balance while maintaining the ability to respond to shocks to sustain stability. Subsequently, academic debates on strengthening the resilience of socio-economic systems at various levels intensified, particularly in light of escalating crises at the scale of the global economy (Benson et al., 2006; Amaratunga et al., 2019) and within the domestic context (Voznyak et al., 2023). A marked surge in scholarly inquiry was observed during the COVID-19 pandemic and, in the case of Ukraine, continues in the context of the full-scale Russian–Ukrainian war. Notable contributions have also addressed resilience in personal, organizational, corporate, and territorial dimensions (Du Boys & Tiberghien, 2022; Mykolenko et al., 2025).

Contemporary research conceptualizes system “resilience” not only in terms of preserving equilibrium but also in terms of development under conditions in which such equilibrium has been disrupted. In this sense, system resilience is understood as the capacity to absorb disturbances and adapt during periods of change, maintaining core functions, structure, and interconnections (Walker et al., 2004). The ability of socio-economic systems to preserve balance and adapt to various disturbances is a central focus of scholarly inquiry, with researchers emphasising that systemic transformation often results from collapse or significant shocks; accordingly, resilience is interpreted more broadly as a long-term property of systems (Feola, 2015).

The global financial crisis of 2008 catalyzed research specifically focused on the financial resilience of countries, cities, and municipalities. The substantive focus of resilience studies has centred on determining whether local self-government bodies can facilitate municipal adaptation to financial shocks and on examining the relationship between resilient municipalities and resilient local governance (Shaw, 2012). In this context, resilience is conceptualised as collective efforts to enhance municipalities’ response and recovery capacities in the face of crises (Pfefferbaum et al., 2017). Scholars identify key components of municipal resilience as including resources, adaptive capacity, and the ability to absorb crisis-induced disturbances (Rapaport et al., 2018), as well as economic development capacity, social capital, community competencies, information, and communication (Levesque et al., 2024).

The full-scale war in Ukraine has generated a series of challenges to which local self-government–supported by the successful implementation of decentralization reform—has been able to respond adequately, sustaining the functioning of local economies and ensuring the continuity of essential services. Over four years of war, all municipalities have operated under markedly different security conditions, implying differentiated risks of financial resilience disruption. Several scholars attribute the “Ukrainian resilience” phenomenon to high levels of mutual trust (which have fostered the development of social networks and civic participation), managerial autonomy (which transfers decision-making responsibility to the local level), and municipal economic capacity (the ability to generate own-source revenues and formulate and execute local budgets) (Rabinovych et al., 2023; Arends et al., 2023).

In general terms, financial resilience serves as a marker of financial well-being (Russell et al., 2020), and economic security (Yakymchuk et al., 2020) and reflects the capacity of economic actors to adapt to new conditions amid financial disturbances (McKnight et al., 2020; Sreenivasan, 2023).

Concerning municipal financial resilience, it should be emphasised that this concept encompasses

not only the capacity of local self-government bodies to manage financial resources and debt obligations effectively (Deevy, 2021) but also the ability to provide public services under shock conditions and to adapt to change. Of particular scholarly interest is the approach that conceptualises municipal financial resilience as the capacity to adapt to change, regardless of its nature, and to leverage such events as opportunities for continued development (Oprea et al., 2020). Undoubtedly, budgetary resilience constitutes a critical component of overall financial resilience—defined as the capacity, under conditions of external shocks, to generate revenues, finance expenditure obligations, restore development potential, and avoid the accumulation of debt-related risks, a dimension to which we have previously devoted substantial attention (Voznyak et al., 2024). Building on this line of inquiry, the present study assesses the financial resilience of all municipalities in Ukraine. The practical relevance of this research lies not only in the need to form a comprehensive understanding of municipalities' capacity to adapt to shocks, recover under heightened instability, and ensure continued development in the post-crisis period, but also in the development of differentiated approaches to mitigating risks of financial resilience disruption and identifying instruments for its strengthening during both wartime and post-war periods. As emphasised in the literature, a system's equilibrium is achieved through proactive measures that anticipate potential risks and reinforce systemic vulnerabilities (Boin & Lodge, 2016; Steccolini et al., 2017).

3. RESEARCH OBJECTIVE, METHODOLOGY AND DATA

The purpose of this article is to assess the financial resilience of Ukrainian municipalities under conditions of war. To achieve this objective, the assessment was conducted in three stages.

In the first stage, using methods of systems and structural analysis, a framework of components and indicators was developed across three dimensions: budgetary autonomy (revenue and expenditure) and investment activity (see Table 1). The empirical basis consisted of local budget data for all municipalities in Ukraine for the period 2021–2025. All municipalities were classified into four types according to the security context: frontline municipalities, municipalities that sustained destruction, municipalities located in support regions, and rear municipalities. The selected spatio-temporal scope ensures relative homogeneity of the sample and enhances the statistical reliability and comparability of the results obtained.

In the second stage, a system for assessing the financial resilience of municipalities was developed by determining indicator thresholds using the extremum method, based on the mean level and variation parameters. This stage facilitates the transition to diagnosing municipal financial resilience at different levels, from the perspective of permissible and risk-prone values. Critical thresholds are interpreted as the minimum acceptable levels of indicators at which financial autonomy is compromised and the risk of non-fulfilment of financial obligations increases. Optimal threshold values, conversely, characterise a financially balanced and resilient state of local budgets, thereby creating conditions for municipal financial self-sufficiency and supporting their economic development.

System of components and indicators for assessing the financial stability of municipalities

Components/indicators	
I. Budgetary autonomy	
I.I. Revenue autonomy	I.II. Expenditure autonomy
<ul style="list-style-type: none"> - Share of own revenues in total local budget revenues, %; - share of local taxes and fees in local budget tax revenues, %; - share of tax revenues in own budget revenues; - tax capacity index (0;1); - ratio of tax revenues to local budget expenditures, coefficient; - level of transfer dependency*, coefficient. 	<ul style="list-style-type: none"> - Ratio of own revenues to current expenditures, coefficient; - share of expenditure on economic activity in total local budget expenditure, %; - share of current expenditures in total local expenditures, %; - ratio of expenditures on maintaining the administrative apparatus to own revenues, coefficient.
II. Investment activity	
<ul style="list-style-type: none"> - Capital expenditure, UAH, per capita; - share of capital expenditures in total expenditures, %; - level of budget development**, coefficient. 	

Note: * share of transfers in total budget revenues; ** ratio of capital and current expenditures. Selected by the authors

The threshold values of financial resilience indicators (catalysts and regressors) were calculated using the extremum method (Formulas 1–2).

$$x_k^{crt} = \mu_{kt} - n\sigma_{kt}, x_k^{opt} = \mu_{kt} + m\sigma_{kt} \quad (1)$$

$$x_r^{crt} = \mu_{rt} + n\sigma_{rt}, x_r^{opt} = \mu_{rt} - m\sigma_{rt} \quad (2)$$

where x_k^{opt} denote the critical and optimal thresholds of the k -th financial resilience indicator (catalyst); x_r^{opt} denote the critical and optimal thresholds of the r -th financial resilience indicator (regressor); μ_{rt} represent the mean values of the k -th and r -th financial resilience indicators over period t ; and σ_{kt} , σ_{rt} denote the variance of the k -th and r -th financial resilience indicators over period t . The parameter n reflects the permissible depth of deviation of an indicator from its mean value ($n = 1$), implying that the critical threshold is set at the level of one standard deviation from the mean. The parameter m is used to determine the optimal threshold of the indicators ($m = 0.5$) and specifies a “soft” deviation from the mean level. The value of m indicates that the optimal state of financial resilience lies within half a standard deviation of the indicator's mean. Notably, this interpretation of the optimal threshold enables it to be understood as a realistic benchmark for financially balanced municipal performance, mitigating the methodological bias inherent in approaches that conceptualise optimal thresholds solely through the prism of maximum permissible limits.

At the third stage, an empirical indicator of municipal financial resilience was constructed using an integral–threshold approach and the method of integral assessment. To this end, the following tasks were undertaken: threshold-oriented normalization of indicators was performed using transformation functions relative to x^{crt} and x^{opt} , ensuring that all indicators were converted to a unified interval [0; 1] and rendered comparable regardless of their dimensionality or initial scale; systems of component indicators were formed through the aggregation of normalized indicators within each dimension of financial resilience (revenue, expenditure, and investment); and a composite financial resilience indicator was constructed using a multiplicative aggregation method.

Normalisation of indicators relative to critical and optimal thresholds was carried out according to

formulas (3–4): if the value of a normalised indicator exceeds the upper bound of the unified interval, it is assigned the boundary value equal to 1.

$$a_{ktn} = \begin{cases} 0, & x_{ktn} \leq x_k^{crt} \\ \frac{x_{ktn} - x_k^{crt}}{x_k^{opt} - x_k^{crt}}, & x_k^{crt} < x_{ktn} < x_k^{opt} \\ 1, & x_{ktn} \geq x_k^{opt} \end{cases}, \quad (3)$$

$$a_{rtn} = \begin{cases} 1, & x_{rt} \leq x_r^{opt} \\ \frac{x_r^{crt} - x_{rtn}}{x_r^{crt} - x_r^{opt}}, & x_r^{opt} < x_{rtn} < x_r^{crt} \\ 0, & x_{rtn} \geq x_r^{crt} \end{cases}, \quad (4)$$

where a_{ktn} , a_{rtn} denote the normalized values of the k -th and r -th financial resilience indicators of municipalities in region n over period t ; and x_{ktn} , x_{rtn} represent the initial values of the k -th and r -th financial resilience indicators of municipalities in region n over period t .

The construction of spatio-temporal indices for the components of financial resilience, as well as for the overall financial resilience of municipalities across regions, is carried out by aggregating normalised indicators across the three dimensions (Formulas 5–6).

$$CFS_{itn} = \frac{1}{n_i} \sum a_{itn} \quad (5)$$

$$FS_{tn} = \prod CFS_{itn} \quad (6)$$

where CFS_{it} denotes the empirical indicator of the i -th component of financial resilience of municipalities in region n over period t ; n_i represents the number of indicators within the i -th component of municipal financial resilience; and FS_{tn} denotes the empirical indicator of the overall financial resilience of municipalities in region n over period t .

Based on the empirical results obtained, a four-level scale for assessing the financial resilience of municipalities across regions was developed:

- [0.00; 0.25] – a critical level of financial resilience, at which municipalities lose solvency and are unable to independently ensure the fulfilment of basic obligations;
- [0.26; 0.50] – a moderate level of financial resilience, characterised by significant financial risks, a high degree of dependence on intergovernmental transfers, and limited financial autonomy;
- [0.51; 0.75] – a permissible level of financial resilience, under which municipalities are generally capable of meeting current obligations, yet remain financially vulnerable to external and internal shocks and demonstrate insufficient efficiency in the utilisation of investment resources;
- [0.76; 1.00] – a high level of financial resilience, marked by financial self-sufficiency, a balanced revenue and expenditure structure, and a high degree of effectiveness in realising the investment potential of municipalities.

An important methodological complement to the comprehensive assessment of the financial resilience of Ukraine's municipalities is the application of the "critical component" rule, which performs a diagnostic and corrective function. Its essence lies in identifying situations in which relatively high values of the composite indicator neutralise or obscure the critical condition of individual components of financial resilience. According to this rule, even if the empirical financial resilience indicator exceeds the threshold of 0.5, the financial condition of a municipality is considered risk-prone if at least one component is below 0.3. The application of this approach enables the timely identification of structural imbalances in municipal financial systems and prevents methodological distortions arising from the "masking" of critical problems by high aggregate values.

The substantive interpretation of the identified levels of financial resilience is defined by a set of threshold values for the indicators. For instance, a critical value of 0.5 for the share of own-source revenues in total budget revenues marks the boundary of structural dependence on intergovernmental

transfers, whereas attaining the optimal level (>0.75) indicates the predominance of own revenue sources and greater financial autonomy. Similarly, a low share of local taxes and fees in the structure of tax revenues (<0.2) and a tax capacity index below 0.79 signal a limited municipal tax base, while convergence toward optimal values reflects a high fiscal potential (Table 2).

Tab. 2

System of Threshold Values for the Indicators Assessing the Financial Resilience of Municipalities across Regions

No	Indicators	x_i^{ert}	x_i^{opt}	Indicator type	Interpretation of critical condition
I. Revenue autonomy					
1	Share of own revenues in total local budget revenues	≤ 0.50	≥ 0.75	Catalyst	High dependence of the budget on interbudgetary transfers
2	Share of local taxes and fees in tax revenues	≤ 0.20	≥ 0.50	Catalyst	Limited fiscal capacity of local authorities
3	Share of tax revenues in own budget revenues	≤ 0.60	≥ 0.95	Catalyst	Unbalanced budget revenue structure
4	Tax capacity index	≤ 0.79	≥ 1.20	Catalyst	Tax capacity level below average
5	Ratio of tax revenues to budget expenditures	≤ 0.50	≥ 0.90	Catalyst	Tax revenues do not cover expenditures
6	Level of transfer dependency	≥ 0.40	≤ 0.20	Regressor	Loss of budgetary financial autonomy
II. Expenditure autonomy					
7	Ratio of own revenues to current expenditures	≤ 0.60	≥ 1.10	Catalyst	Inability to self-finance current expenditures
8	Share of expenditures on economic activity in total expenditures	≤ 0.10	≥ 0.22	Catalyst	Limited capacity to stimulate economic activity
9	Share of current expenditure in total expenditure	≥ 0.80	≤ 0.70	Regressor	Dominance of the "consumer" model of fiscal policy
10	Ratio of expenditures on maintaining the administrative apparatus to own revenues	≥ 0.25	≤ 0.15	Regressor	Excessive administrative burden on the budget
III. Investment activity					
11	Capital expenditure per capita, UAH	≤ 1500	≥ 3000	Catalyst	Investment stagnation and lack of infrastructure upgrades
12	Share of capital expenditures in total budget expenditures	≤ 0.10	≥ 0.20	Catalyst	Displacement of development by current budgetary needs
13	Level of budget development	≤ 0.15	≥ 0.30	Catalyst	Lack of financial prerequisites for development

Note: calculated by the authors using formulas (1) and (2)

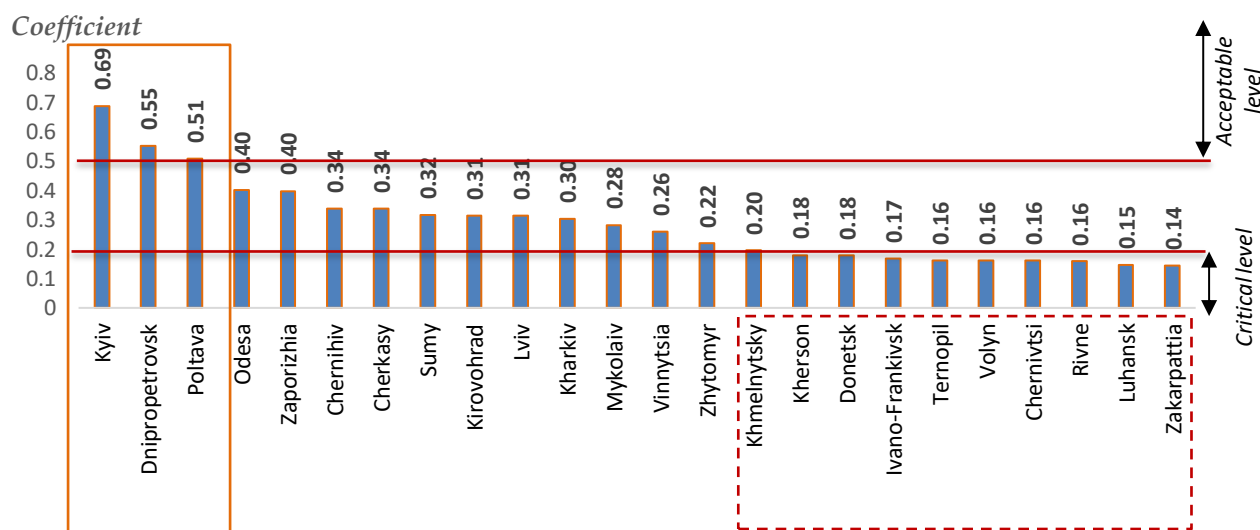
The expenditure structure of local budgets also serves as a sensitive indicator of financial resilience. In particular, an excessive share of current expenditures in total budget expenditures (>0.8) and high spending on administrative apparatus maintenance (>0.25) indicate a consumption-oriented fiscal policy

and a contraction of development capacity. Conversely, the attainment of optimal threshold values for these indicators creates fiscal space for reallocating resources toward development objectives. The investment dimension of financial resilience is reflected in the level of capital expenditures: critically low values (less than UAH 1.5 thousand per capita and a low share in the expenditure structure) signal investment stagnation in municipalities, whereas achieving optimal thresholds indicates a financial policy orientation toward local economic development and recovery.

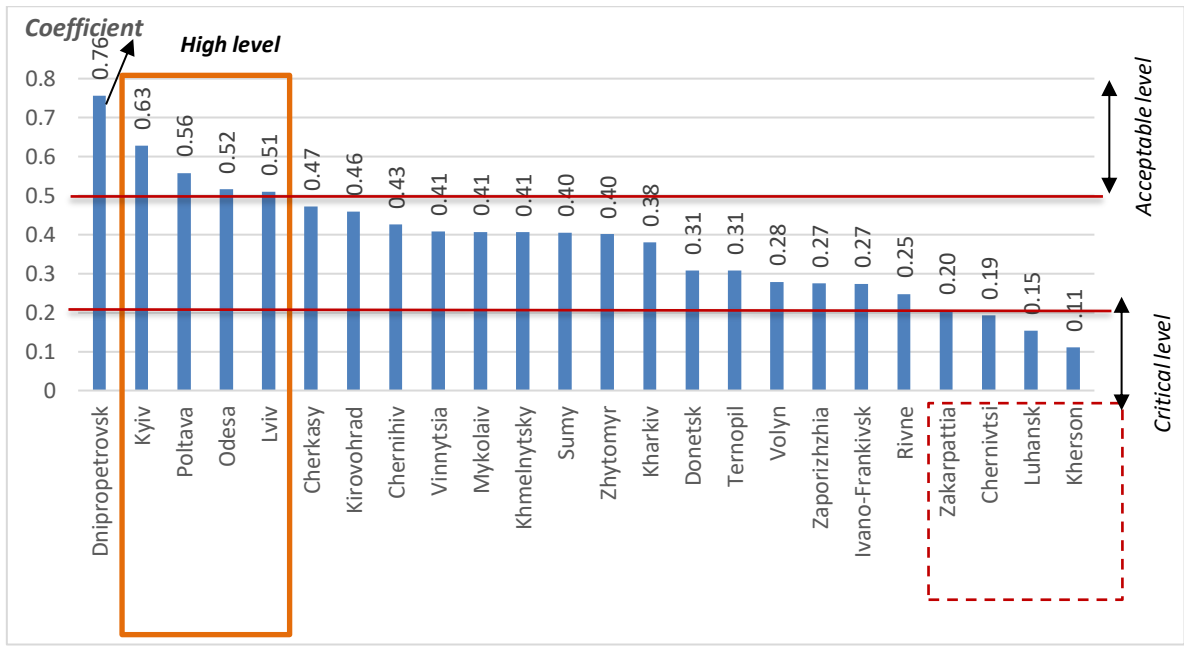
4. RESULTS AND DISCUSSION

The application of the proposed empirical assessment toolkit for evaluating the financial resilience of Ukraine's municipalities yielded the following results.

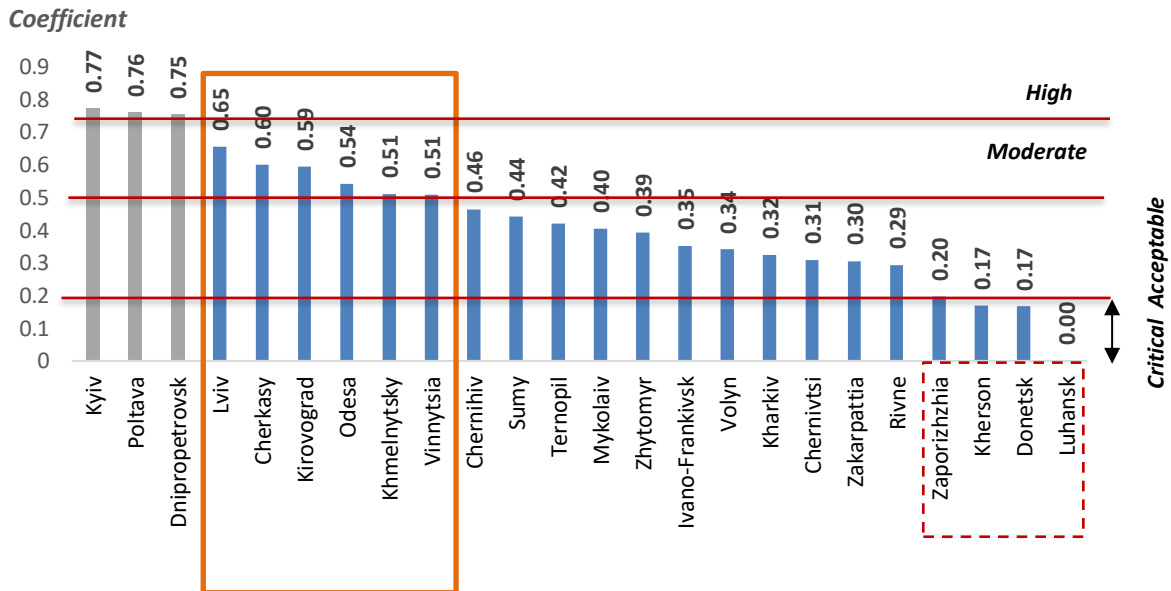
The empirical assessment of the revenue autonomy component of Ukraine's municipalities for the period 2021–2025 indicates a substantial transformation in the spatial structure of financial resilience, driven by wartime, demographic, institutional, and economic factors. A transition occurred from a relatively balanced pre-war model to a polarised configuration, in which financially resilient rear municipalities concentrate the majority of tax resources, while frontline and de-occupied territories are characterised by critical dependence on intergovernmental transfers. In 2021, municipalities in Kyiv, Dnipropetrovsk, and Poltava Oblasts occupied leading positions in terms of revenue autonomy, driven by the concentration of industrial production, a high share of revenues from personal income tax and corporate profit tax, and relatively stable employment levels (Figure 1a). At the same time, a considerable number of municipalities—even in the pre-war period—were characterised by low values of the revenue autonomy index (below 0.3) (Luhansk, Zakarpattia, Rivne, and Chernivtsi Oblasts), indicating substantial transfer dependence of local budgets. A defining feature of the pre-war period was the relatively even distribution of values within the mid-range, reflecting the spatial allocation of productive forces.



a) 2021



b) 2023



c) 2025

Fig. 1. Financial Resilience of Municipalities across Regions of Ukraine: The “Revenue Autonomy” Component, 2021, 2023, 2025

Note: based on the authors’ calculations

In 2023, a sharp shift occurred in the regional positions of municipalities regarding revenue autonomy, directly driven by hostilities, intensive migration, and the destruction of economic and production infrastructure (Figure 1b). Municipalities in Dnipropetrovsk Oblast assumed leading positions, as under wartime conditions, they perform the functions of a logistical and industrial hub, having preserved a significant share of their production potential and a high level of tax capacity. Municipalities in Kyiv and Poltava Oblasts also maintained high values of the revenue autonomy indicator due to the concentration of economic activity, relatively stable employment levels, and a comparatively favorable security environment.

By contrast, municipalities in regions where active hostilities were ongoing or which experienced temporary occupation (notably Kherson, Luhansk, Zaporizhzhia, and Donetsk Oblasts) were

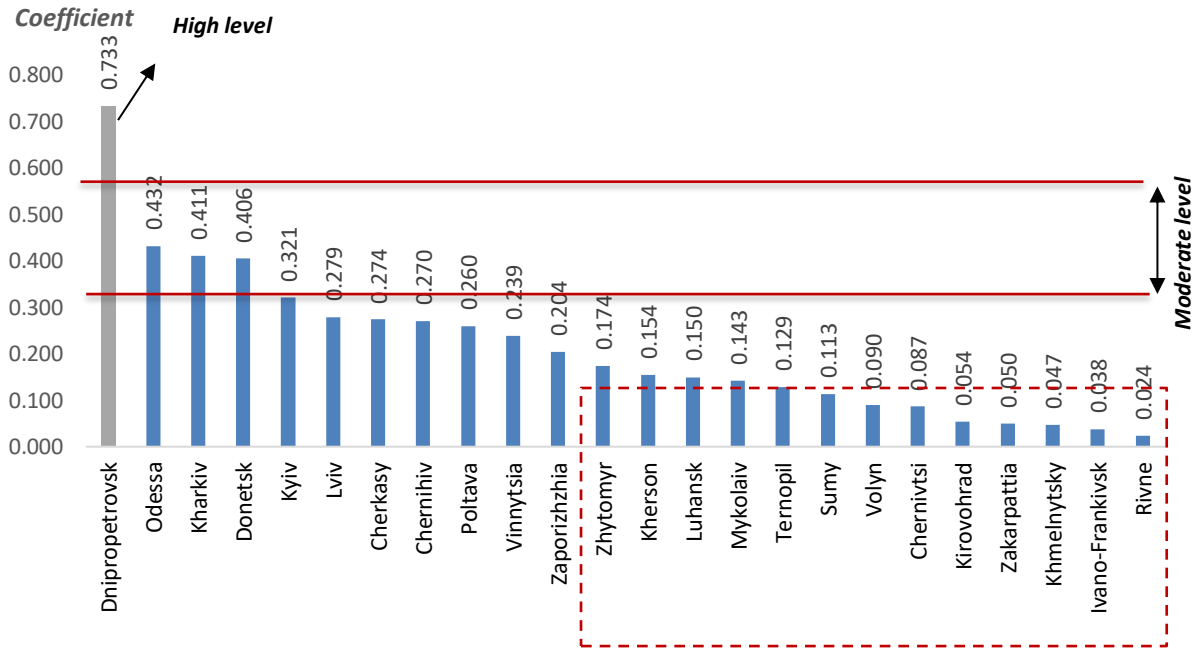
characterized by critically low levels of revenue autonomy. This was attributable to a dramatic decline in tax revenues, driven by the contraction of entrepreneurial activity, business relocation, large-scale population displacement, and the predominance of intergovernmental transfers in the revenue structure of local budgets. At the same time, an increase in revenue autonomy was observed in rear regions, particularly in Lviv, Cherkasy, Kirovohrad, and Vinnytsia Oblasts, reflecting a spatial redistribution of economic activity.

As of 2025, a new configuration of revenue budget autonomy has emerged, reflecting municipal adaptation to the conditions of a protracted war. The highest empirical values were recorded in the municipalities of Kyiv, Poltava, and Dnipropetrovsk Oblasts. At the same time, substantial growth was recorded in municipalities in Lviv, Cherkasy, Kirovohrad, and Khmelnytskyi Oblasts, which transitioned into the zone of permissible or near-optimal revenue autonomy. This indicates structural shifts in local economies, an expansion of the tax base, and a gradual reduction in the dependence of local budgets on transfers (Figure 1c). Meanwhile, municipalities that sustained extensive destruction and/or remain under occupation (Luhansk, Donetsk, and Kherson Oblasts) continued to remain within the zone of critically low revenue autonomy. In particular, the zero values of the empirical revenue autonomy indicator for municipalities in Luhansk Oblast confirm the de facto inability to restore the revenue side of local budgets without large-scale state and international financial support.

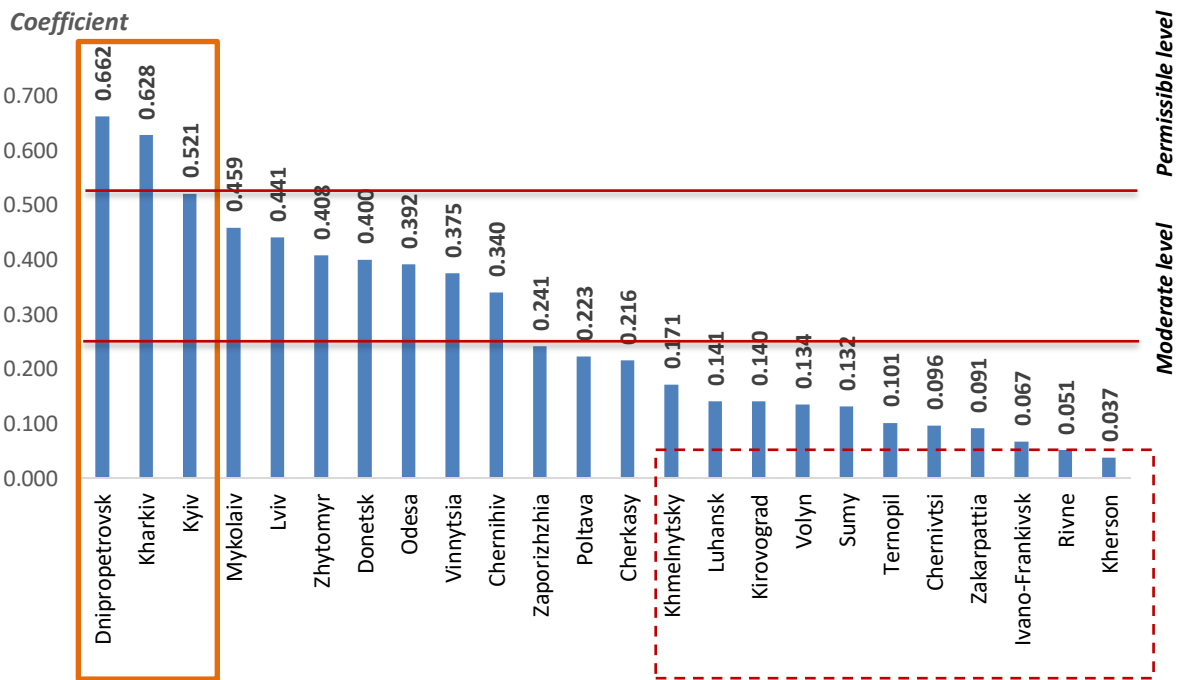
It is noteworthy that despite the declared strengthening of own-source revenues within the decentralisation framework, the capacity of Ukraine's municipalities to build a sustainable revenue base remains limited. The revenue structure of local budgets is characterised by a high concentration in specific sources, primarily the personal income tax, which increases budget sensitivity to fluctuations in employment, migration, and economic activity. Consequently, a significant challenge lies in the continued dependence of most municipalities across regions on intergovernmental transfers, which, on the one hand, perform a stabilising function, yet, on the other, create institutional constraints on ensuring revenue autonomy. The predominant orientation of fiscal equalisation toward compensating revenue shortfalls reduces incentives to expand one's own financial resources and perpetuates asymmetries in municipal fiscal capacity.

It should also be emphasised that the problem is exacerbated by the limited instruments of local tax policy and the low flexibility in the use of existing revenue sources. The absence of effective mechanisms to expand the revenue base by stimulating economic activity, investment, and employment results in the dominance of exogenous factors in the formation of budget revenues. As a result, revenue autonomy of local budgets does not function as a long-term financial foundation for development but instead becomes derivative of general economic conditions and decisions taken by local self-government bodies.

An existential challenge to ensuring expenditure autonomy for Ukraine's municipalities is the predominance of protected current expenditures in local budgets, particularly spending on social protection, wages, and the maintenance of the administrative apparatus. Under conditions of wartime and humanitarian pressures, the share of such expenditures increases, effectively crowding out development-oriented financing. This generates a "rigid" budget structure, within which local self-government bodies are deprived of instruments for active fiscal maneuvering and strategic resource reallocation. In 2021, the expenditure budget autonomy of municipalities across Ukraine's regions was characterised by a relatively moderate level of interregional differentiation. The highest values of this component were demonstrated by municipalities in Dnipropetrovsk, Odesa, and Kharkiv Oblasts, indicating their capacity to cover a significant portion of current expenditures from their own revenues while retaining a certain degree of fiscal manoeuvrability. At the same time, even in the pre-war period, a substantial number of regions were situated within the zone of critically low expenditure autonomy (component values below 0.2), reflecting the dominance of current, socially protected, and administrative expenditures in the structure of local budgets and the limited availability of financial resources to support development initiatives (Figure 2a).



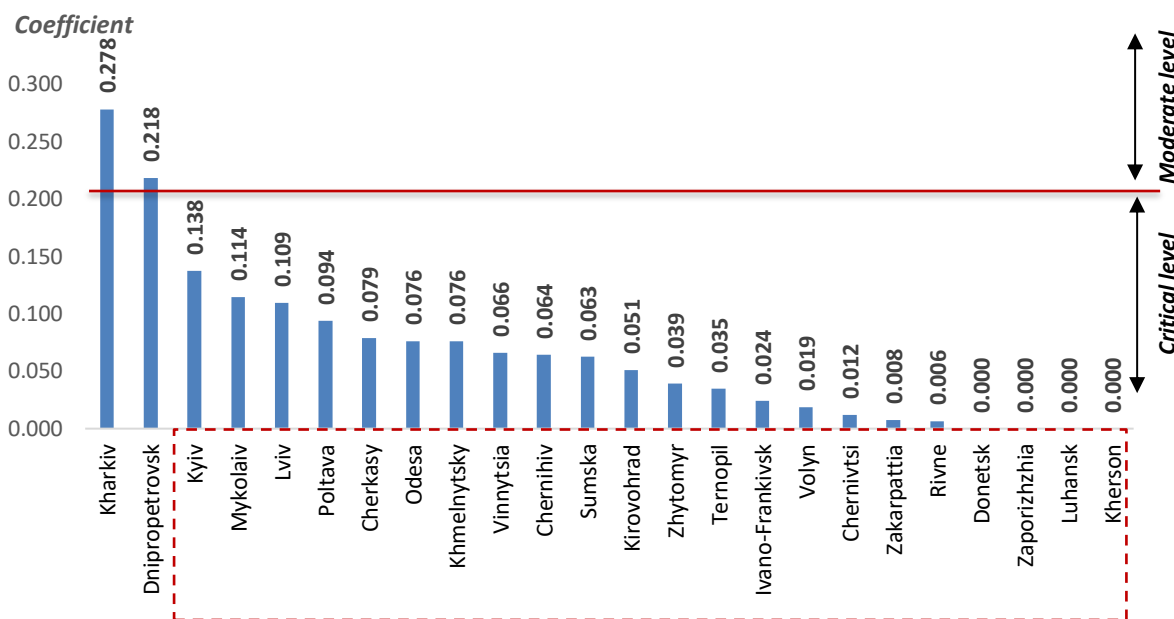
a) 2021



b) 2023

In 2023, a temporary increase in expenditure autonomy was recorded in certain rear and frontline municipalities, particularly in Dnipropetrovsk, Kharkiv, and Kyiv Oblasts. This was driven by the concentration of state financial flows, business relocation, and increased volumes of intergovernmental resources allocated to sustain municipal functioning under wartime conditions (Figure 2b). Nevertheless, even in the leading regions, the value of this component did not exceed 0.7, indicating the structurally constrained nature of expenditure autonomy and the strengthened role of centralised financing. For the majority of regions, the capacity to optimise the expenditure structure remained limited, as budgetary priorities were concentrated on financing social transfers, defence-related, and

humanitarian needs.



c) 2025

Fig. 2. Financial Resilience of Municipalities across the Regions of Ukraine:
The "Expenditure Autonomy" Component, 2021, 2023, 2025

Note: based on calculations

The empirical findings demonstrate that wartime conditions exacerbate fiscal gaps arising from the mismatch between revenue and expenditure dynamics in local budgets. Even in municipalities experiencing partial recovery of own-source revenues, the expenditure structure remains inertial, characterized by a high level of fixed obligations. This restricts the ability to reallocate resources toward infrastructure reconstruction, support for economic activity, and investment projects, thereby diminishing the long-term effectiveness of budgetary policy. In 2025, a systemic and nearly universal deterioration of expenditure budget autonomy was observed across municipalities in Ukraine's regions. Even municipalities in Kharkiv Oblast exhibited only a moderate level of expenditure autonomy (0.278). For most regions, the corresponding indicator did not exceed 0.1, and in certain cases (Donetsk, Luhansk, Kherson, and Zaporizhzhia Oblasts), expenditure autonomy was effectively nullified, reaching zero values (Figure 2c).

The results of calculations of the level of investment activity of municipalities across Ukraine's regions in 2021–2025 indicate high volatility of investment processes, driven by the combined effects of wartime challenges and associated shocks, including budget constraints and the spatial reorientation of investment flows. The empirical values obtained reflect a sharp change in leading regions, periods of substantial decline in investment activity, and gradual adaptation of certain territories to the new operating environment. In the pre-war year 2021, the highest levels of investment activity were observed in municipalities in industrially and infrastructurally developed regions, particularly in the Dnipropetrovsk (0.995), Odesa (0.913), Donetsk (0.910), and Kyiv (0.871) Oblasts. At the same time, in several regions, investment activity remained critically low (Ternopil – 0.011; Sumy – 0.033; Chernihiv – 0.042), indicating limited potential for development budgets even prior to the onset of the full-scale war (Figure 3).

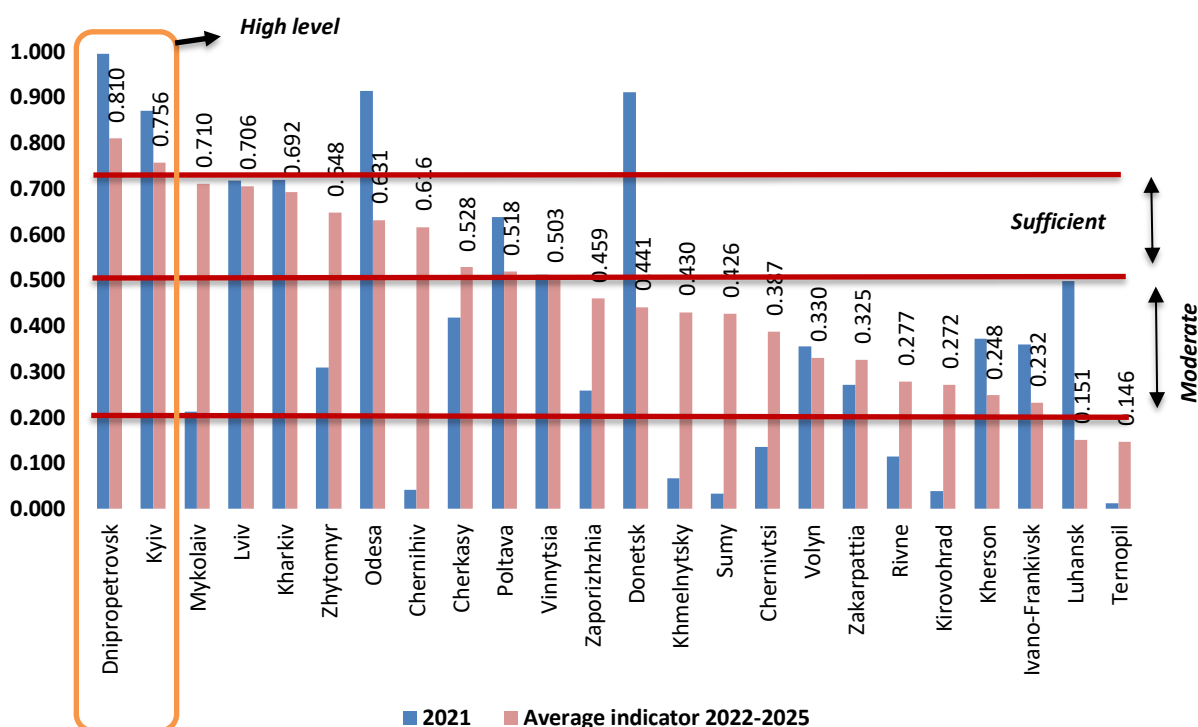


Fig. 3. Financial Resilience of Municipalities across the Regions of Ukraine: The "Investment Activity" Component, 2021–2025

Note: based on calculations

A substantial contraction of investment activity in 2023 across virtually the entire territory of Ukraine led to a situation in which, for the overwhelming majority of municipalities, the value of the investment activity component of financial resilience fell to zero. Only selected oblasts retained a minimal level of investment activity, notably Dnipropetrovsk (0.248), Poltava (0.123), Lviv (0.114), and Kyiv (0.071), reflecting the forced reallocation of budgetary resources toward urgent security and social needs.

In 2024–2025, a clearly pronounced polarization of the municipal investment space emerged. Leading positions became concentrated within a limited group of municipalities, primarily in Dnipropetrovsk and Kyiv Oblasts (component value – 1.000), as well as in Kharkiv (0.924), Odesa (0.918), and Lviv (0.895) Oblasts. At the same time, investment activity in Luhansk Oblast remained at zero, reflecting the objective impossibility of restoring investment processes under conditions of prolonged occupation and loss of territorial control.

Under conditions of resource scarcity, public investment has been progressively crowded out by current expenditures, while capital expenditures increasingly serve as a temporary budgetary compensation instrument. The reduction or postponement of infrastructure projects constrains local economic development and reinforces an inertial model of financial resilience oriented primarily toward maintaining the basic functioning of municipal financial systems. The absence of a stable investment component in the structure of local budgets deepens territorial dependence on external funding sources and restrains the expansion of own-source revenue bases in the medium and long term.

The empirical results indicate a significant weakening of municipalities' financial resilience across Ukraine's regions in 2021–2022. Under the impact of wartime shocks, even municipalities in economically strong regions experienced a decline in financial autonomy, while frontline and certain rear territories shifted into the zone of critical financial vulnerability. In 2021, municipal financial resilience was characterized by a relatively moderate degree of interregional differentiation: leading positions were held by Dnipropetrovsk (0.760), Kyiv (0.626), and Odesa (0.582) Oblasts, reflecting their

high tax capacity, diversified economic structures, and ability to maintain a relative balance between the revenue and expenditure sides of local budgets (Figure 4).

By 2022, the composite financial resilience indicator declined in all regions. The most pronounced reductions were observed in municipalities in Kyiv (-0.248 percentage points), Odesa (-0.229 p.p.), Donetsk (-0.193 p.p.), and Kherson (-0.145 p.p.) Oblasts, reflecting a substantial erosion of the revenue base, increased expenditure pressures, and heightened transfer dependence under martial law. At the same time, despite the overall negative dynamics, certain regions in 2022 retained relatively stronger positions or demonstrated signs of partial stabilization in financial resilience. In particular, municipalities in Lviv Oblast maintained an index value of 0.384, while municipalities in Mykolaiv (0.374), Poltava (0.370), and Kharkiv (0.355) Oblasts remained within the permissible range of financial resilience. Such differentiation is attributable to the spatial redistribution of economic activity, the relocation of businesses and population, and the increased role of state and international financial support in sustaining the basic solvency of municipalities.

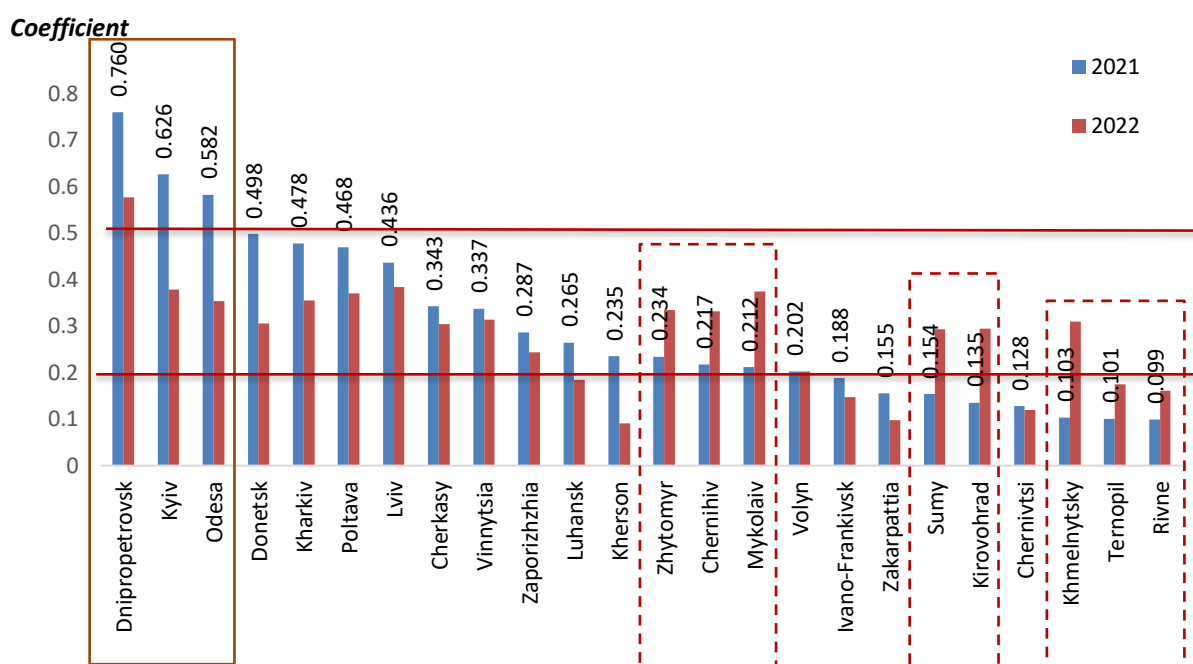


Fig. 4. Financial Resilience of Municipalities across the Regions of Ukraine:

A Comparative Assessment of the Pre-War Period (2021) and the First Year of the Full-Scale War (2022)

Note: based on the authors' calculations

The most critical levels of financial resilience in 2022 were recorded in the municipalities of Kherson (0.090), Zakarpattia (0.097), Chernivtsi (0.120), and Luhansk (0.184) Oblasts. These regions are characterized by a high dependence of local budgets on intergovernmental transfers and the de facto absence of an investment component, which substantially constrains their development potential. The particularly sharp decline in financial resilience in municipalities in Kherson and Luhansk Oblasts was driven by the temporary occupation of parts of their territories, large-scale destruction of production and social infrastructure, and, consequently, a drastic contraction of local tax revenues.

In 2023–2025, the financial resilience of municipalities across Ukraine's regions has evolved amid heightened spatial asymmetry and the predominance of the security factor. In this context, 2023 may be interpreted as a conditional point of relative stabilisation, whereas 2025 reflects a selective recovery of financial resilience in certain regions. In particular, municipalities in Donetsk Oblast experienced a significant deterioration in financial resilience, from 0.522 in 2023 to 0.129 in 2025, while in Luhansk

Oblast, the indicator declined to zero. At the same time, municipalities in Zaporizhzhia and Kherson Oblasts showed the opposite trend: the index values increased from 0.200 to 0.399 and from 0.089 to 0.253, respectively, indicating partial restoration of budgetary governance and gradual adaptation of municipal financial systems to the new operating environment.

Municipalities in regions that sustained direct destruction from hostilities (Zhytomyr, Kyiv, Sumy, and Chernihiv Oblasts) experienced a gradual decline in financial resilience after peaking in 2023. In Kyiv Oblast, for example, the index value decreased from 0.716 in 2023 to 0.636 in 2025; in Chernihiv Oblast, from 0.541 to 0.420; and in Zhytomyr Oblast, from 0.598 to 0.395. Such dynamics reflect the cumulative effect of budgetary and socio-economic losses, increased expenditure pressures, and the limited availability of internal resources to sustain development under prolonged wartime conditions.

By contrast, municipalities in support regions that most frequently performed logistical functions (Vinnytsia, Dnipropetrovsk, Kirovohrad, Odesa, Poltava, and Cherkasy Oblasts) exhibited relatively high levels of financial resilience in 2023. However, in 2024–2025, even within this group, a moderate yet systemic decline in the relevant indicators is evident. The most illustrative case is Dnipropetrovsk Oblast, where the financial resilience index decreased from 0.803 in 2023 to 0.799 in 2024 and further to 0.657 in 2025 (Figure 5), reflecting sustained pressure on social, financial, and logistical infrastructure due to the region's prolonged role as a recipient of internally displaced persons and relocated economic activity.

Municipalities in rear regions exhibit the most heterogeneous dynamics of financial resilience. On the one hand, Lviv Oblast maintained relatively high index values (0.650 in 2023 and 0.553 in 2024), indicating its capacity to maintain a basic level of financial balance amid wartime challenges. On the other hand, municipalities in Volyn Oblast experienced a substantial deterioration in financial resilience, with the indicator declining from 0.341 in 2024 to 0.164 in 2025. At the same time, municipalities in the Rivne and Ternopil Oblasts recorded gradual increases in index values in 2025, indicating the formation of localised adaptive mechanisms. Thus, in the rear regions in 2025, a nascent trend toward recovery in financial resilience relative to 2024 is evident, though it remains fragmented.

The results of the empirical analysis confirm that the weakening of municipal financial resilience is primarily driven by structural imbalances between revenue and expenditure autonomy. This increases the risk of entrenching a “financial survival” model, in which fiscal policy focuses on short-term balancing of revenues and expenditures without adequate consideration of investment recovery objectives. In the absence of targeted instruments for strengthening municipal financial resilience, this may lead to the degradation of infrastructure development, deterioration in the quality of public services, and the erosion of the competitive positions of certain territories in the medium and long term.

Accordingly, under current conditions, the financial resilience of municipalities across Ukraine's regions constitutes a key prerequisite for effective budget planning and the implementation of public investment. Wartime economic challenges have substantially transformed the functioning of local public finance, resulting in heightened instability of the revenue base, increased uncertainty of expenditure obligations, and a significant narrowing of opportunities for long-term investment planning. Under such circumstances, financial resilience refers to the capacity of local budgets to withstand prolonged fiscal pressures, maintain control over financial flows, and preserve the minimum necessary development potential.

In discussing the appropriateness of conducting empirical assessments of municipal financial resilience under wartime conditions, it should be emphasized that the application of an approach integrating revenue autonomy, expenditure autonomy, and investment activity into a single composite model—through threshold-oriented normalization of indicators and the “critical component” rule—enabled the identification of boundary and risk-prone states of financial resilience. In our view, the value of this approach lies in its capacity to provide a comprehensive assessment of financial potential and of local economies' ability to recover and progress.

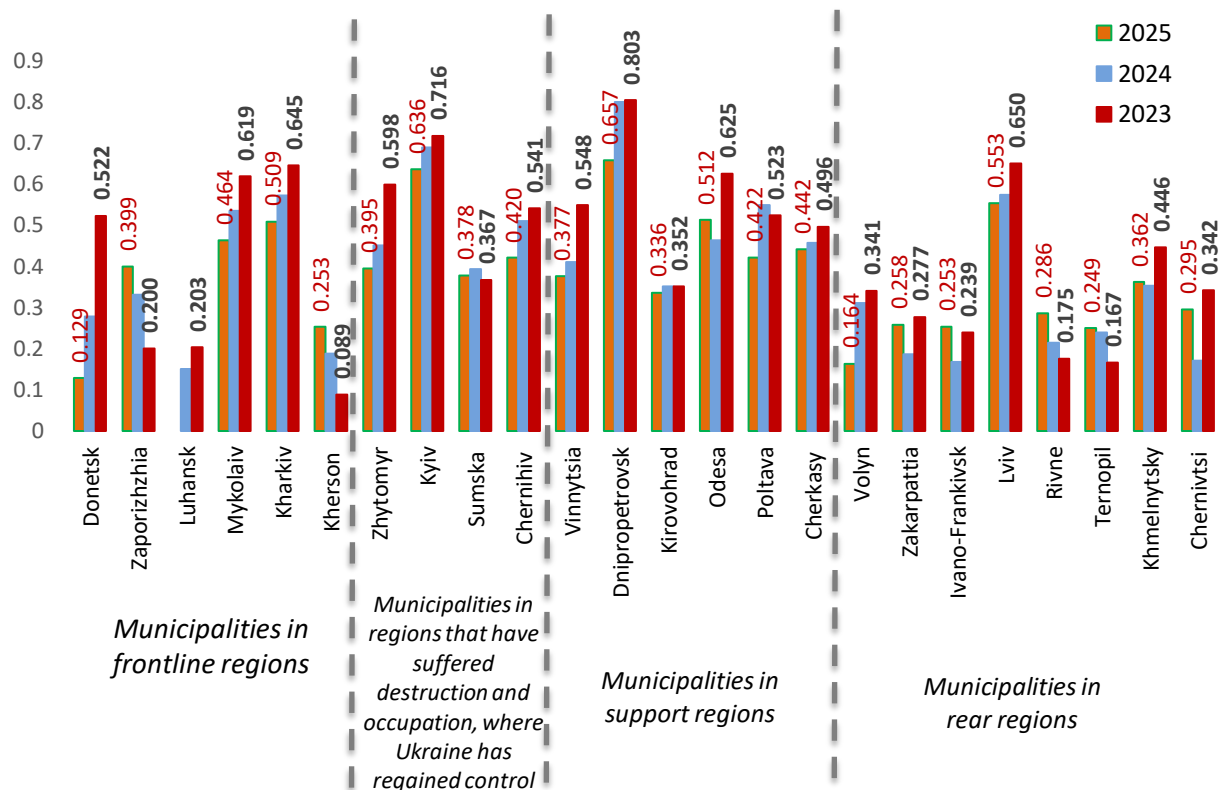


Fig. 5. Financial Resilience of Municipalities across the Regions of Ukraine: A Projection of a Differentiated Territorial Approach, 2023–2025

Note: based on calculations

5. CONCLUSIONS

Thus, based on the proposed methodological toolkit, the selected system of indicators and components, and the application of the chosen methods (extremum method, integral assessment, determination of distances to critical and optimal thresholds, aggregation of normalized indicators, and multiplicative aggregation), an empirical assessment of the financial resilience of Ukraine's municipalities was conducted across four groups for the period 2021–2025. This enabled the following conclusions to be formulated.

A weakening in the financial resilience of Ukraine's municipalities during the full-scale invasion has been identified. Whereas in 2021–2022, the clearly defined leaders were the Dnipropetrovsk (0.760), Kyiv (0.626), and Odesa (0.582) Oblasts, in 2023–2025, financial resilience exhibited pronounced spatial asymmetry. In particular, municipalities in frontline regions demonstrated critical deterioration (Donetsk—from 0.522 to 0.129; Luhansk—to zero), while municipalities in certain support regions retained permissible levels of financial resilience (Dnipropetrovsk with an empirical indicator of 0.657; Kyiv—0.636). In rear regions, the dynamics were heterogeneous: municipalities in Lviv Oblast maintained relatively high values, whereas those in Volyn Oblast deteriorated to 0.164 in 2025.

It is clearly observable that during 2022–2025 municipalities formed two models of revenue autonomy: (1) a model of regional polarization (in 2023, frontline and occupied municipalities declined to critical levels—Kherson, Luhansk, and Zaporizhzhia—while municipalities in Dnipropetrovsk (0.757), Kyiv (0.628), and Poltava (0.558) Oblasts preserved or increased their financial resilience potential); and (2) an adaptive model (in 2025, Kyiv (0.771), Poltava (0.760), and Dnipropetrovsk (0.754) approached the optimal threshold (0.75), while Lviv (0.654), Cherkasy (0.601), and Kirovohrad (0.594) entered the zone of permissible autonomy; municipalities in Luhansk Oblast continue to record zero values).

Municipal expenditure autonomy across all regions of Ukraine systematically deteriorated

throughout the study period. In 2021, even the leading regions (Dnipropetrovsk with an empirical expenditure autonomy indicator of 0.733, Odesa (0.432), and Kharkiv (0.411)) did not reach optimal values, indicating constrained potential already in the pre-war period; more than one-third of regions remained below the critical threshold.

It has been empirically demonstrated that municipal financial resilience is characterized by internal structural disproportionality. The recovery of revenue autonomy has not been accompanied by the restoration of expenditure flexibility, and investment activity remains selective. This increases the risk of entrenching a “financial survival” model oriented toward maintaining minimal solvency at the expense of long-term development.

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Возняк Галина, Сороковий Данило, Голинський Юрій, Маріола Гжебик. Фінансова стійкість територіальних громад України в умовах російсько-української війни: емпіричні оцінювання. *Журнал Прикарпатського університету імені Василя Стефаника*, **13** (2) (2026), 213-230.

Війна росії проти України посилила асиметрію соціально-економічного розвитку територій, що своєю чергою, зумовило радикальну трансформацію фінансових основ функціонування територіальних громад України. Зазначене обумовлює необхідність напрацювання диференційованих підходів до зміцнення фінансової стійкості територіальних громад у воєнний і повоєнний період. Метою статті є оцінювання фінансової стійкості територіальних громад в умовах війни в Україні. Методами дослідження слугували: системно-структурний (побудова інформаційно-аналітичної моделі дослідження фінансової стійкості); інтегральної оцінки (побудова емпіричного показника фінансової стійкості громад); мультиплікативний (побудова композиційного показника фінансової стійкості громад). Інформаційно-аналітичною базою дослідження слугували дані всіх територіальних громад України у розрізі чотирьох груп за 2021 – 2025 рр. Виявлено послаблення фінансової стійкості територіальних громад України за час широкомасштабного вторгнення. У тилкових регіонах динаміка неоднорідна: громади Львівської області утримували відносно високі значення, тоді як Волинської області погіршилися до 0,164 у 2025 р. Чітко простежується існування двох моделей дохідної автономії: (1) регіональної поляризації (у 2023 р. прифронтові та окуповані громади опустилися до критичних рівнів (Херсонська, Луганська, Запорізька), а громади Дніпропетровської (0,757), Київської (0,628) і Полтавської (0,558) областей зберегли або наростили потенціал фінансової стійкості) і (2) адаптаційну модель (у 2025 р. Київська (0,771), Полтавська (0,760) та Дніпропетровська (0,754) наблизилися до оптимального порогу (0,75), а Львівська (0,654), Черкаська (0,601) і Кіровоградська (0,594) увійшли до зони допустимої автономії; громади Луганської області зберігають нульові значення). Видаткова автономія громад всіх регіонів України системно погіршувалася протягом усього досліджуваного періоду. Емпірично доведено, що фінансова стійкість громад характеризується внутрішньою структурною диспропорцією. Помітні фіскальні розриви, а інвестиційна активність має селективний характер.

Ключові слова: війна, стійкість, Україна, фінанси, місцеві бюджети, інвестиції, територіальні громади, місцеве самоврядування, оцінювання, борг.