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SUSTAINABILITY OF LOCAL PUBLIC FINANCE AND REGIONAL DEVELOPMENT: CHALLENGES AND OPPORTUNITIES IN TIMES OF CRISIS IN UKRAINE

Hanna Kotina
Candidate of Economy Sciences, Associate Professor of the Department of Finance named after Viktor Fedosov, Kyiv National Economic University named after Vadym Hetman, Kyiv, Ukraine;
e-mail: akotina.kneu@gmail.com
ORCID: 0000-0001-7783-866X
(Corresponding author)

Maryna Stepura
Candidate of Economy Sciences, Associate Professor of the Department of Finance named after Viktor Fedosov, Kyiv National Economic University named after Vadym Hetman, Kyiv, Ukraine;
ORCID: 0000-0001-5881-5411

Diana Matviichuk
PhD Student of the Department of Finance named after Viktor Fedosov, Kyiv National Economic University named after Vadym Hetman, Kyiv, Ukraine;
ORCID: 0000-0001-6640-5770

Anna Maister
Candidate of Economy Sciences, Associate Professor of the Department of Finance named after Viktor Fedosov, Kyiv National Economic University named after Vadym Hetman, Kyiv, Ukraine;
ORCID: 0000-0002-0547-4489

ABSTRACT

The socio-economic crisis in Ukraine, which has worsened over the past decade, has had a profound impact on all local communities. Local governments implementing decentralised mechanisms and anti-crisis financial measures are currently facing numerous theoretical and procedural constraints, which, although not homogeneous, have a cumulative effect. In the context of low economic potential and existing legislative constraints, local governments cannot actively manipulate consistent sources of local budget revenues (taxes) to support sustainable regional development, and therefore a coherent policy of credit and fiscal equalisation is an important aspect of ensuring the sustainability of local public finances. The purpose of the paper is to assess the correspondence between the fiscal sustainability of local budgets (with a focus on the borrowing component) and the economic sustainability of regions. Empirical studies of Ukraine's experience based on regression modelling have not found a clear direct link between the drivers of fiscal sustainability of local budgets (solvency, dependence on intergovernmental grants, stability of tax revenues) and the sustainability of socio-economic development of Ukrainian regions. In addition, in the context of the crisis and external shocks, strict adherence to the criteria of fiscal balance of local budgets undermines the ability to ensure a sustainable recovery of the regional economy, so it is important not to limit the fiscal capacity of communities by attracting local borrowings and intergovernmental grant during the crisis.

Keywords: fiscal sustainability, socio-economic development, local borrowing, fiscal decentralization, intergovernmental grant, local public finance, local debt, regional development

JEL Classification: E63, H74, H73, H77

INTRODUCTION

The budget at the local level is a tool for the socio-economic development of the territory, the development of its infrastructure, and the high-quality provision of local public services. To perform these functions and achieve sustainability, especially in times of crisis, it is vital to have adequate local budget revenues. The local budget is constructed of two main components - revenues and expenditures – balancing which, in theory at least, a straightforward exercise to achieve the sustainability of local public finance. However, despite the theoretical simplicity, in practice, there are geopolitical factors, in addition to legislative restrictions, that prevent local authorities from actively manipulating the main components of their budgets.

The last decade has been a challenge for Ukraine's local budgets due to the 2013-2014 crisis, the unprecedented, combined effect of the COVID-19 pandemic and the military conflict. These incidents led to severe financial difficulties as the economy contracted, businesses felt constrained, and household incomes declined. Despite recent significant trends in the structure of local budget expenditures with a focus on supporting the sustainable socio-economic potential of the regions (Figure 1), budget support for economic activity, education, social protection and social security has now been significantly reduced by more than 30%.

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Figure 1. Structure of budget expenditures and inflation rate in Ukraine, 2014-2022. *(Source: composed by the authors based on statistical collection of the Ministry of Finance of Ukraine)*

This, combined with price instability, creates additional disincentives for socio-economic challenges under martial law. As a result, local budgets cannot reliably cover their expenditures with stable sources (Figure 2).

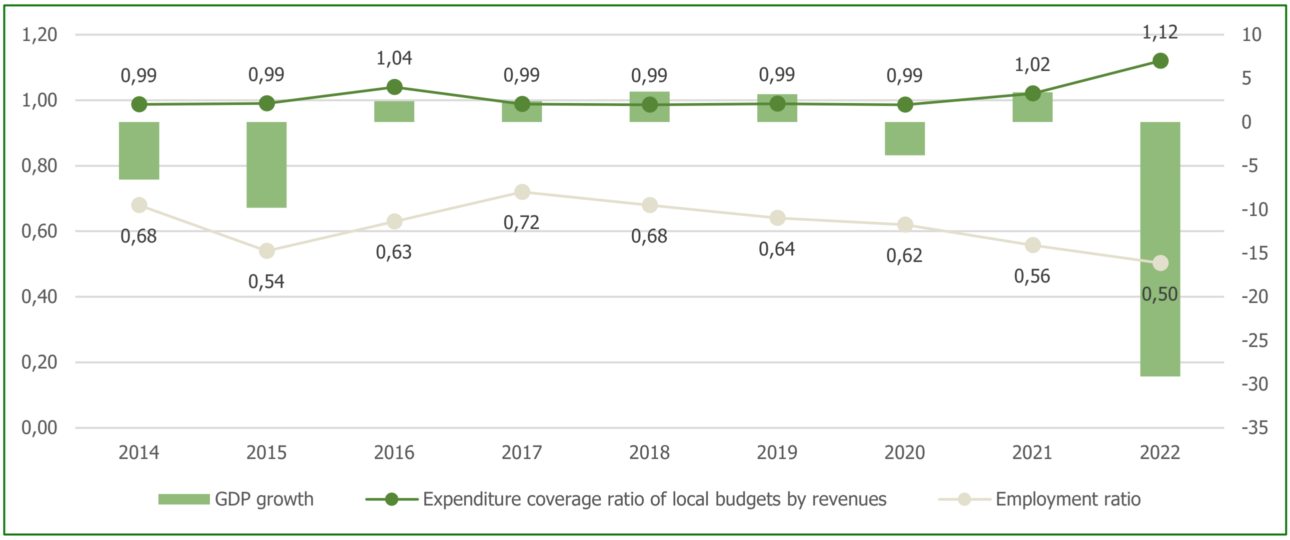

Figure 2. Economic activity and constraints of local budgets in Ukraine, 2014-2022. *(Source: composed by the authors based on data from IMF, statistical collection of the Ministry of Finance of Ukraine)*

Thus, local communities are faced with a fundamental problem - their own revenues are not enough to meet their financial needs, which undermines the fiscal sustainability of local authorities. In such circumstances, local borrowing serves as a timely source of fiscal support for communities in the short term, ensuring the socio-economic development of territories, infrastructure, and the provision of quality public services.

At the same time, the crisis has affected not only the financial capacity of local governments in the country but also abroad. The scale of this impact is difficult to assess, but the response of governments at all levels through timely fiscal stabilisation instruments (grants, development loans) and mechanisms for their restructuring is clearly relevant. Recognising that local finances are the basis for supporting and developing communities, their role in times of crisis is crucial. Therefore, the issue of solvency of local governments and ensuring the balance of local budgets is extremely relevant today.

For this reason, the importance of local borrowing and intergovernmental grants, as well as obtaining additional financial resources, is a key issue for ensuring the effectiveness of local self-government. However, this instrument of additional financing has a two-sided impact on the sustainability of community budgets. On the one hand, the use of borrowed resources by local authorities generates local debt, which in the long run may affect the solvency of communities to meet their obligations, i.e., a high level of debt burden is one of the factors that affect the sustainability of socio-economic development of territories in a multi-level budget system. On the other hand, the productive use of borrowed funds for sustainable purposes leads to an increase in the economic sustainability of the regions, which in the long run will ensure the fiscal sustainability of local budgets as well. Therefore, it is worthwhile to analyse the mutual influence of fiscal and economic sustainability at the regional level.

LITERATURE REVIEW

Fiscal and economic sustainability

Recently, research has focused on the relationship between financial sustainability, often in the context of financial difficulties (fiscal crises, austerity policies or management of cuts), and specific aspects of economic sustainability (efficiency and quality of public services, demographic factors, sustainable infrastructure development, etc.). Thus, the largest diameter of scientific research on debt issues is associated with the economic (financial) development of the country (Filatova et al., 2022). The last research (Sinervo, 2020) aims to better understand this phenomenon by studying the interpretations of local politicians regarding financial stability in the context of informed decision-making in local governments. The scholars (Hiroki and Ueshina, 2023) analysed the relationship between the budget deficit and the birth rate, concluding that an increase in the budget deficit reduces it, which negatively affects economic sustainability. Also, researchers and international experts stress the need for a broader analysis of public finance in different-sized municipalities, given the heavy indebtedness, which is often exacerbated by the decline in the number of rural residents (Lara-Rubio et al., 2022). This study also found that certain demographic and socioeconomic factors influence the likelihood of defaulting on loans in municipalities of all sizes, with the impact being more balanced between demographic and socioeconomic variables in large communities.

Studies by Chinese scientists on the impact of vertical fiscal imbalance on the overall productivity of the green factor of the region (as a sustainable one) came to the conclusion that it has a depressing effect in regions with a similar level of economic development, negatively affecting economic stability (Zhao, 2023). Given the high level of public debt in European countries and the projected costs associated with the ageing of the population, the issues of fiscal stability remain relevant in the medium and long term. In addition, many Western countries have witnessed significant "structural deficits" and have undergone a fiscal evolution from government-supported countries to debtor countries (Antonio et al., 2023). In today's global economic environment, there is a steady upward trend in income inequality between countries (Xie et al., 2023), which is driven by the free movement of capital. Particularly in the context of international tax competition and the development of digital transformations, it is becoming increasingly difficult to adapt solely by increasing the tax burden on capital and labour. Therefore, socio-economic stability and resilience have become more dependent on the debt component of fiscal policy.

In addition, new risks are emerging due to the intensification of military conflicts in Europe and the East. Within this frame of reference, the prudent and efficient local public financial management, both in terms of expenditure and revenue (Kuzheliev et al., 2018) and considering the requirements of the European Recovery and Resilience Plan (RRC) to stimulate investment to enhance economic stability and development, remains crucial for better allocation of resources and achievement of sustainable fiscal regulation (Congregado et al., 2023). In addition, the socio-economic development of the country in modern conditions requires the state to apply progressive forms, methods and principles of cost management in a multi-level budget system.

Determination of financial sustainability of local budgets

Financial sustainability is an important criterion of local public finance for the development of local government infrastructure and ensuring the well-being of citizens. Different approaches to determining financial sustainability are considered. For instance, Chapman (2008) determines financial sustainability as the lasting capabilities of local authorities to consistently correspond with their financial liabilities (cyclical, structural, and intergovernmental). Researchers also determined the level of stability of the local budget by the amount of funds necessary to ensure minimum budget expenditures (Nolan and Pitt, 2016). At the same time, "the minimum budget expenditures are understood as the funds provided in the budget to finance constitutionally guaranteed measures related to ensuring the livelihood of the population". Shcherbakova and

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Manerov (2011) define the financial stability of local public finances as the ability of local authorities to mobilize their own financial resources in a timely manner and in full to perform their functions and provide the population of the subordinate territory with an appropriate level of public goods. Others view financial sustainability as the ability of local governments to accumulate revenues sufficient to cover their expenses and ensure a balanced budget during the budget year (Nolan and Pitt, 2016).

In the theory of public finance, the concept of stability is often identified with the concept of equilibrium, stability, and sustainability (Bondaruk et al., 2019). In conjunction with foreign and domestic authors' conclusions, the issues of balancing local budgets to achieve their financial stability was discovered. Thus, a sustainability balanced local budget is a financial plan based on reasonable assumptions that shows how revenues will equal expenditures in the short and medium term (Afonso and Coelho, 2023). By setting balanced budgets, it is possible to achieve the sustainability of the development of territories in the long term. Its aspect is crucial in the case of further steps to ensure the financial stability of the government (Fire, 2014). However, in times of crisis, it is not always possible to reach sustainability by manipulating the revenue or expenditure sides of local budgets. Therefore, local authorities attract credit resources to perform basic functions and tasks. By taking on debt resources, local authorities have obligations that must be paid within a certain period, ensuring that all the necessary needs of the community are covered. At the same time, the growth of the debt burden will cause an imbalance in the development of territories, which will affect the quality of life of residents (Blöchliger et al., 2007).

Faden (2011) viewed the sustainability of territories as support for municipalities as a place with appropriate living and as places that offer economic and other opportunities to their inhabitants, that is, ensure the continuous sustainable development of territories. During the recovery period, achieving the resilience of local communities and supporting their sustainable development, the government will become one of the crucial factors in overcoming the consequences of the war.

AIMS AND OBJECTIVES

Hence, assessing the correspondence between the fiscal sustainability of local budgets (with a focus on the borrowing component) and the economic sustainability of Ukrainian regions will be the main purpose of the given research. Thus, the study is focused on the topical issue of the sustainability of local budgets (as fiscal balance) and their financial, economic, and social strengthening in terms of stress time in Ukraine. For this purpose, the dataset covers the period of the last two crises before the full-scale invasion of Ukraine: 2014-2015, caused by the invasion of Crimea and Donbas, and 2019-2021, caused by the pandemic.

Therefore, it is important to study this issue in the context of decentralization and sustainable development of local communities. The scientific hypothesis of the given research is following fiscal sustainability of local budgets in Ukraine has a direct interconnection with the economic resilience of regions in times of crisis.

The article examines the financial statistics of certain municipalities of certain countries (Ukraine and Germany), the choice of which is determined by the project within which this research was carried out in order to assess how the sustainability of local budgets revives the economic activity of regions and contributes to their sustainable development.

Thus, the article consists of the following sections: after a brief introduction, a brief review of the theoretical foundations and literature on the sustainability of local budgets and local debt, the correlation between sustainability and resiliency of socio-economic development of regions is made, data and methodology for choosing a research method and achieving the goal of publication are presented. The empirical part is devoted to the assessment of regulatory constraints and practical possibilities for achieving fiscal sustainability of municipalities, the research process and the results obtained are described in detail, and the final section presents discussions, conclusions and recommendations for further research in the field of ensuring the fiscal and economic sustainability of regions in times of crisis.

METHODS

The scientific hypothesis of the article is evaluated through the study and assessment of the relationship between the components of fiscal sustainability (the state of local debt, the level of fiscal solvency of municipalities, the level of local budget fiscal balance, intergovernmental grant dependence, tax stability of the region) and the resiliency of socio-economic development of regions. The focus of the research is on the consolidated data of local public finance, as well as a comparison of government finance statistics and individual financial indicators of the city of Bremen (Germany) and the city of Khmelnytskyi (Ukraine) in order to substantiate the cause-and-effect relationships of fiscal solvency and the budget structure of municipalities.

A systematic analysis was used to assess and estimate the level of local debt. The main data are taken from the open public statistics of the State Treasury Service of Ukraine, the Ministry of Finance of Ukraine, the National Bank of Ukraine, the Ministry of Economy of Ukraine, decentralization monitoring, the Ministry of Social Policy of Ukraine, local self-government bodies of Ukraine, open budget, Budget statistics of the city of Bremen.

To establish the relationship between local debt and the factors influencing it, the multifactorial regression method was used. The logistic models were tested in advance, the most adequate was the multifactorial regression model, the factors of which were the following indicators:

$$LB_k^b = f(T_k^s,\ LD_k^c,\ G_k^d) \quad (1)$$

where – LB_k^b *– is the fiscal balance ratio of local budgets;* G_k^d *– is the share of official intergovernmental grants from public authorities to local;* LD_k^c *– is the coverage ratio of local borrowings with local budgets' own revenues; and* T_k^s *– is the stability of tax revenue mobilization.*

Therefore, after conducting an in-depth empirical study of the financial sustainability of municipalities and the overall uneven regional economic development of Ukraine, identifying regulatory constraints, and considering theoretical findings on the essence of fiscal sustainability of local budgets, it can be argued that a fair and prudent system of balancing the fiscal capacity of communities is driven by the following pillars:

Local debt – the level of fiscal solvency (LD_k^c):

$$LD_k^c = \frac{OR}{D}, \quad (2)$$

where – OR *– is own revenues of local budgets;* D *– is the volume of local government debt.*

In the meantime, if the level of socio-economic development exceeds the average weighted interest rate on local borrowings and local government bonds, this is a reason to talk about the territory's capability to repay its debt liabilities.

b) the ability of resilient regional development, including the investment attractiveness of the territories for business development, as well as the growth of capital expenditures for infrastructure restoration. The latest research by domestic scholars demonstrates that increased decentralisation of fiscal responsibilities triggers an enhancement of the appeal of the climate funds matter of local economic development (Voznyak et al., 2023);

Taxes – stability of tax revenue mobilization (T_k^s*):*

$$T_k^s = T_k^r * G_g * T_k^{ex}, \quad (3)$$

where – T_k^r *– is the share of tax revenues in local budget revenues;* T_k^{ex} *– is the execution ratio of tax revenue mobilization;* G_g *– is the real GDP growth.*

Intergovernmental Grants – the transfer dependence ratio ($\mathrm{G}_\mathrm{k}^\mathrm{d}$):

$$G_k^d = \frac{G}{R}, \quad (4)$$

where – G *– is an official intergovernmental grant from state authorities to local authorities;* R *– is local budget revenues.*

Thus, the possibility of achieving a sustainable budget (balanced budget) as the ability of communities to cover financial obligations with their own revenues, considering transfer dependence and timely mobilized taxes, is estimated. In addition, to assess the impact of the sustainability of local budgets on socio-economic development, the article considers Ukrainian budget practices over the past decade, undoubtedly, in crisis conditions. Also, in order to confirm the hypothesis of the impact of the fiscal sustainability indicator on the socio-economic development of regions, the consolidated index of resiliency of socio-economic development of regions was calculated (according to the list of assessment indicators given in Annex 1 to the Resolution of the Cabinet of Ministers of Ukraine dated 21.10.2015 No. 856 "On Approval of the Procedure and Methodology for Monitoring and Evaluating the Effectiveness of the Implementation of the State Regional Policy") by calculating the geometric mean of the following indicators that characterize the sustainable goals implementation, such as, economic resiliency, investment and innovation attractiveness of the region, efficiency and quality of public services,

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financial self-sufficiency, infrastructure development and energy efficiency: *GRPc* - GRP index per capita, *Mr* - Rural out-migration index, *Oi* - Index of industrial output per capita, *Ic* - Index of capital investments (excluding investments from the state budget) per capita, *Ec* - Index of capital expenditures of local budgets (excluding transfers from the state budget) per capita, *Wa* - Index of average wages in the region, *Hc* - Index of total housing stock per capita, *Fc* - Index of the total capacity of alternative fuel boilers in the region as a percentage of the total capacity of boilers in the region, *Gu* - Index of graduates of secondary schools who received 160 points and above in the external independent evaluation of the Ukrainian language and literature, *Sc* - Index of the level of social service coverage of people in difficult life circumstances by territorial social service centres.

To determine the impact of fiscal sustainability and solvency of local budgets on the socio-economic development of regions, the following relationship model is built on the basis of regression analysis:

$$ED_k^r = f(LB_k^b,\ LD_k^c) \quad (5)$$

where – ED_k^r *– a composite index of the socio-economic development of regions in Ukraine;* LB_k^b *– fiscal sustainability index of local budgets in Ukraine;* LD_k^c *– fiscal solvency of local budgets in Ukraine.*

RESULTS

Legislative Framework of local public finance and fiscal sustainability

Nowadays Ukraine is on the way to implementing an effective decentralized financial system, where the fiscal capacity of communities is of immense importance (Dekhtyar et al., 2020). Therefore, many Ukrainian authors pay attention to this issue in their research. Kostyrko and Velenteychyk (2016) rely on the capacity of local communities, including ensuring the socio-economic development of territories, which will be achieved when financial stability is ensured. Moreover, Ukrainian scientists Vorobyov and Kohut (2012) also considered the sustainability of local budgets as a factor that can influence the development of local authorities not only in the short but also in the long term.

To value the legislative framework regarding the financial sustainability of local public finance in Ukraine, to assess the limitations of local authorities and the peculiarities of the local borrowing process, the current regulatory legal environment for budget legislation is investigated.

The use of additional sources of funding is a priority for sustainable financial support of local and public needs. This forces the government to bargain for the most enchanting fund mechanisms at various levels, to attract new sources of financial resources on favourable terms for the local communities. Considering the achievements of the decentralization reform in terms of expanding the financial capacity of local communities, the institution of debt financing remains unresolved.

Currently, local borrowings are defined and regulated by the Budget Code of Ukraine and the Resolution of the Cabinet of Ministers of Ukraine "On Approval of the Procedure for Local Borrowing" (On Approval of the Procedure for Local Borrowing, 2011). According to Art. 72 and Art. 77 of the Budget Code of Ukraine (BCU, Art. 77), local budgets with a deficit are approved by the decision of the relevant local council only under the special fund of the part of the development budget that is covered by borrowings, and in case of a free balance budget funds in the part of the general fund. In addition, credit agreements and issues of local bonds that can be used by local authorities (On Approval of the Procedure for Local Borrowing, 2011). That is, the regulatory framework limits the ability of local self-government bodies to attract free financial resources to the development budget for special purposes. However, in the practice of the budget process of the last decade, there are actual cases that contradict regulatory requirements, in particular, non-compliance with the conditions for obtaining loans and setting deficit limits for the general fund of local budgets, as well as the lack of a procedure for issuing bonds of external local loans, which leads to the inaction of local councils in the international bond markets, despite the formal permission to issue securities, a limited number of local councils have the right to carry out local borrowings (the current legislation provides for the right to receive loans only by regional and city councils, which is a third of the existing municipalities in Ukraine).

Therefore, the deficit of the special fund arises only in the event of a shortage of funds to finance the budget programs provided for by this fund. At the same time, the amount of debt obligations of municipalities may not exceed 200 per cent of the average annual projected revenues of their development budget. The legislative framework on the local budget deficit and local borrowings is shown in the following (Figure 3):

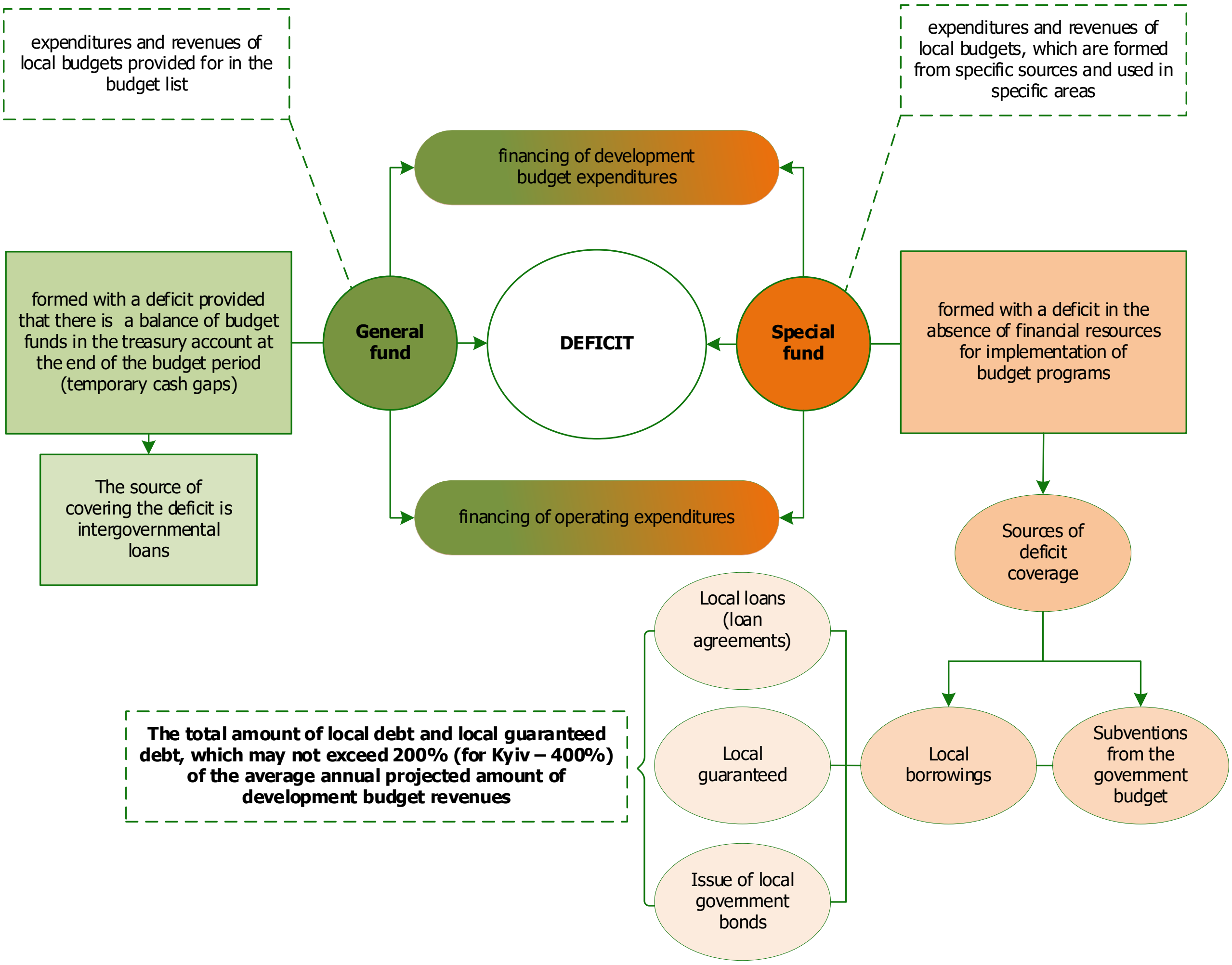

Figure 3. Legislative Framework on Local Budget Deficit and Local Borrowings.

Empirical Framework of local public finance and fiscal sustainability

According to the economic classification of budget expenditures, as the practice of recent years shows, the capital expenditures of local budgets in Ukraine account for up to 10% of all expenditures, which are mainly directed to infrastructure development. Compared to Ukrainian data, Bremen's capital expenditures in recent years are also in the range of 8-11% (Figures 4-5). But at the same time, local authorities of European countries prefer to attract credit resources for the socio-economic development of their territories.

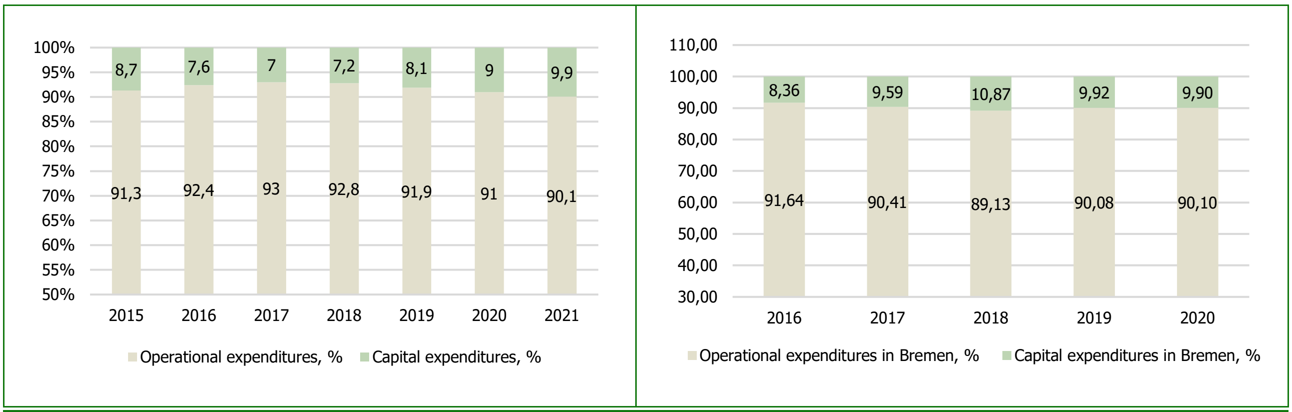

Figure 4-5. Capital expenditures vs current expenditures of local budgets in Ukraine 2015-2021) (*left side*) and in Bremen (Germany) (2016-2020) (*right side*). *(Source: Composed by the authors based on the Statistical Yearbook of Bremen (2021)*

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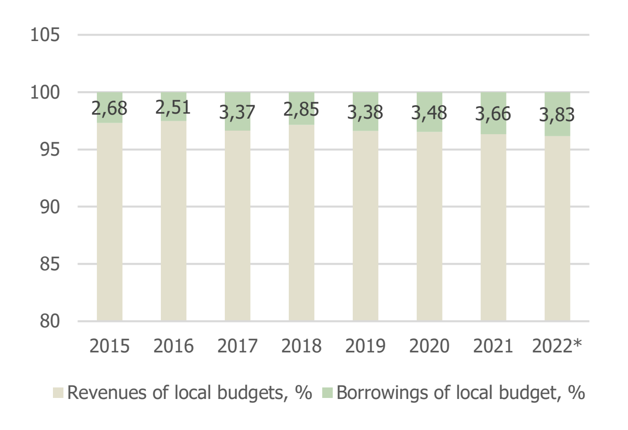
At the same time, analyzing the volume of local borrowings and the corresponding state of local debt over the past decade, there is a tendency to increase the studied indicators. However, their absolute volume in comparison with local budget revenues is not a significant part (on average, only 2-4% of all revenues), which indicates a low level of political decentralization in Ukraine and the ability to find additional sources of funding on the local level (Figures 6-7).



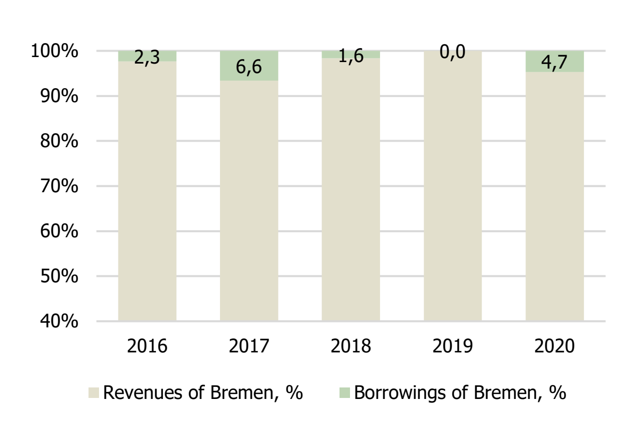


Figure 6-7. Structure of Local Borrowings in Local Budget Revenues of Ukraine (2015-2022) (*left side*) in Bremen (Germany) (2016-2020) (*right side*). *(*planed indicator, Source: Composed by the authors based on Statistical Yearbook of Bremen (2021))*

But in comparison to the experience of Ukraine with developed countries (Bremen, Germany) it can be clearly seen that the borrowings in Bremen will also make up an insignificant part of local budget revenues (Figures 8-9).

On the one hand, debts occupy an insignificant part of the local budgets, but this does not mean that the state of local budgets is sustainable, because, given the regulatory restrictions on local authorities, they are fully responsible for covering borrowings with their own financial resources (BCU, Art. 74 (4-6)). Thus, in 2021, local debt accounted for 29% of local budgets' own revenues, but even this figure is an average among all budgets. It cannot be emphasized because it does not fully reflect the problem due to the uneven distribution of borrowing volumes (Figure 8).

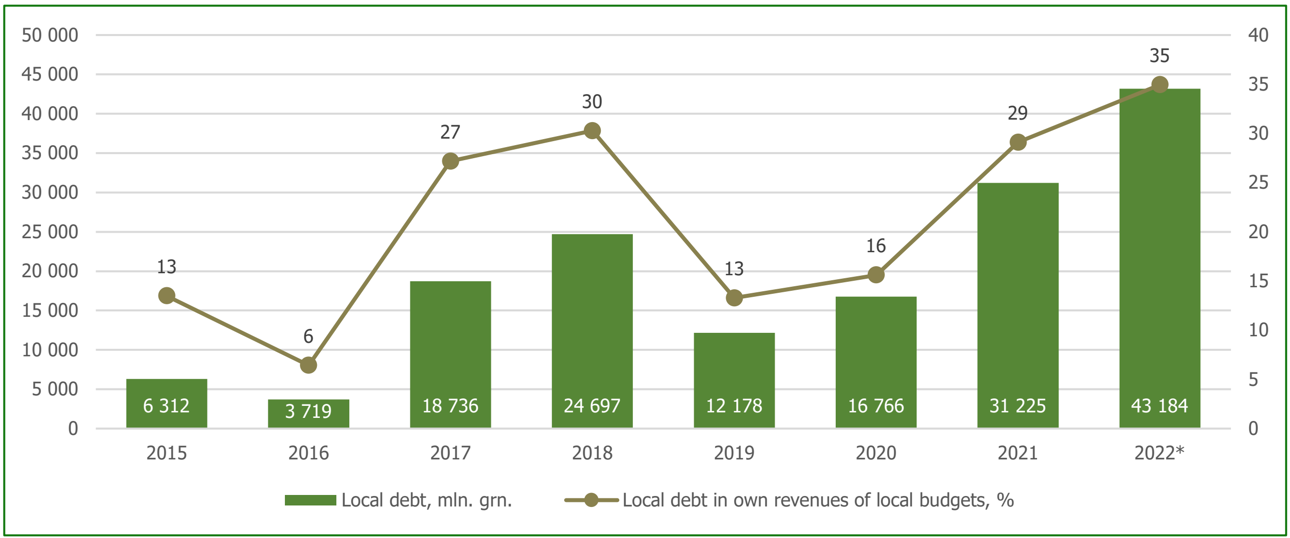


Figure 8. Local debt vs own revenues of local budgets in Ukraine (2015-2022). Note: planned indicator. *(Source: composed by the authors based on statistical collection of the Ministry of Finance of Ukraine)*

Debt liabilities are primarily a function of a particular territory, not of the state, because some territories may have no debt at all, and some territories may have debt obligations that exceed their own financial resources. For instance, in the case of Khmelnytskyi, figures show that the local debt of this region exceeds its own revenues, which indicates the instability of this budget and the difficulty of ensuring sustainable socio-economic development of the territory. At the same time, local authorities cannot effectively meet the needs of citizens, as all their own resources will be used to repay debt obligations (Figure 9).

Figure 9. Local debt vs own revenues in Khmelnytskyi city (2017-2020). *(Source: Composed by the authors based on information on the implementation of the Khmelnytskyi budget)*

Such circumstances require local communities to pay off the assigned revenues in the form of intergovernmental transfers. Besides, if we focus on debt servicing, it is actually allowed to pay off the debt even partially at the cost of a percentage of certain subventions transferred under the current legislation of Ukraine (BCU, Art. 74 (5)). Thus, it supports the opinion of researchers (Potrafke and Reischmann, 2023) about the vicious circle of debt and transfer dependence of municipalities, which reduces the financial autonomy of municipalities and increases the overall public debt burden. At the same time, in Ukraine, intergovernmental transfers account for almost half of local budget revenues (Figure 10). Empirical data on the ratio of revenues and intergovernmental transfers received by local governments to ensure the performance of their core functions confirm that grants also affect the sustainability of local budgets.

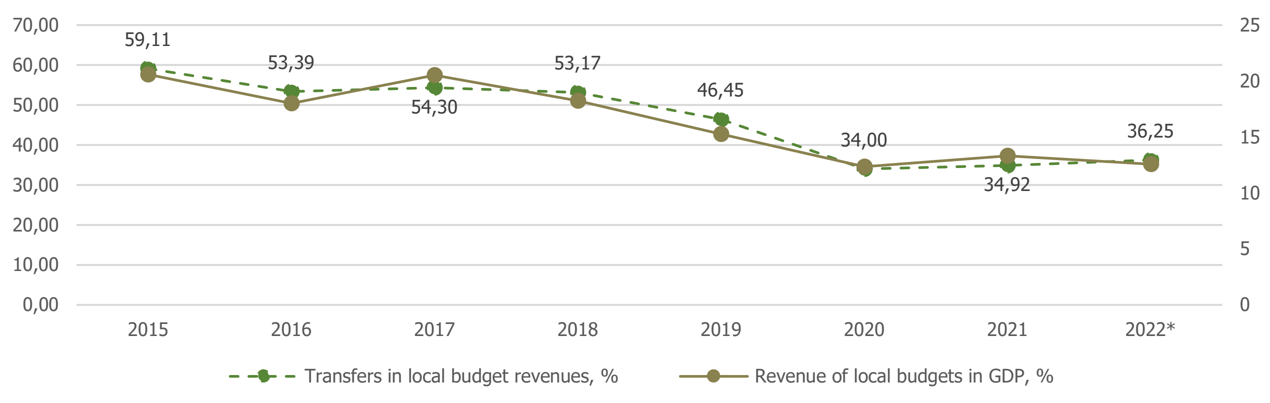


Figure 10. Intergovernmental grants as part of local budget revenues in Ukraine, 2015-2022. Note: planned indicator. *(Source: Composed by the authors based on statistical collection of the Ministry of Finance of Ukraine)*

Furthermore, Figure 8 clearly shows that the decentralisation reform at the local level leads to a decrease in transfer dependence, but no increase in real local budget revenues (as a percentage of GDP). Therefore, it is especially important to understand how to ensure efficient use of local budget funds and, if they are insufficient, how to attract them properly. In addition, given that the economic situation has worsened over the past 5 years because of COVID-19 and the military conflict in Ukraine, this has led to changes in the formation and provision of financial resources to local budgets. Thus, in 2022, local debt increased by almost 30%. Overall, the real decline in budget revenues was 26% compared to the same period in 2021. In addition, tax revenues, namely corporate income tax, property tax, and single tax, which are the basis of the financial capacity of communities, have fallen dramatically (Figure 11).

The reduction in business activity, the departure of citizens abroad, and numerous destructions of infrastructure are the key causes of this downturn (Bohdan, 2022). Therefore, for Ukrainian communities in the given circumstances, strengthening the credit aspect of local budget revenues is also an important part of ensuring the stable functioning of communities, as well as the basis for achieving fiscal sustainability of local budgets.

That is why achieving fiscal sustainability could be an argument in support of the socio-economic development of regions. Fiscal sustainability, as one of the many financial aspects of regional policy, allows local governments to provide basic

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social services such as education, healthcare, infrastructure, security, social assistance, etc. Without stable funding, these services may be limited or provided in a poor-quality manner.

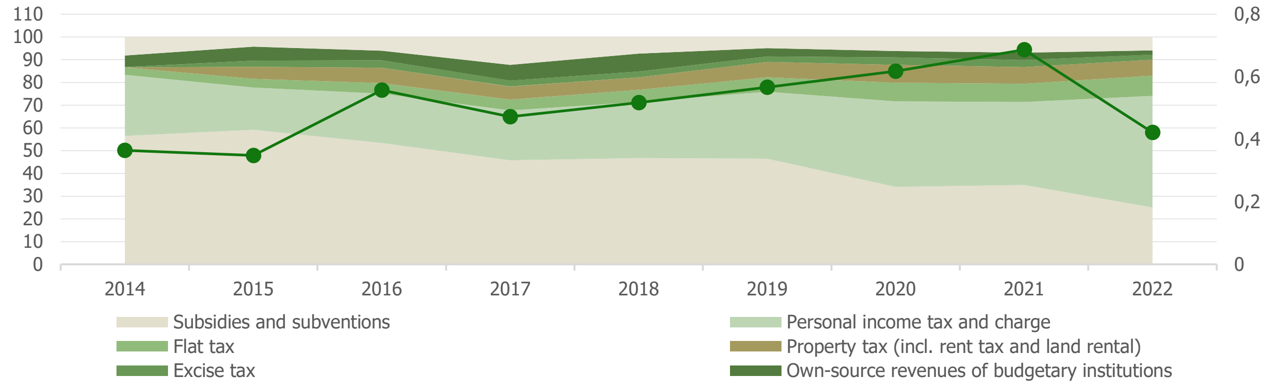

Figure 11. Structure of local budget revenues and stability of tax revenues in Ukraine, 2014-2022. *(Source: Composed by the authors based on statistical collection of the Ministry of Finance of Ukraine)*

Having reviewed the socioeconomic standing of the regions in Ukraine by calculating the aggregate index of the resilience of socio-economic development (Figure 12) and building a map of the economic resilience of the regions (Figure 13), it is clearly visible that only one-sixth of the regions in Ukraine have above-average parameters of resilient socio-economic development, while most regions of Ukraine have an average level of socio-economic development, the most developed region in 2015-2021 was only Kyiv, which confirms the horizontal imbalance of economic potential of the territories. In addition, domestic researchers have shown that territorial communities of regions in Ukraine characterized by a weak development capacity demonstrate the significant decentralization of transfer dependence than communities with strong development capacity, and the crisis phenomena affect socio-economic development differently by regions (Storonyanska et al., 2021; Voznyak et al., 2023), which impacts the financial sustainability of municipalities.

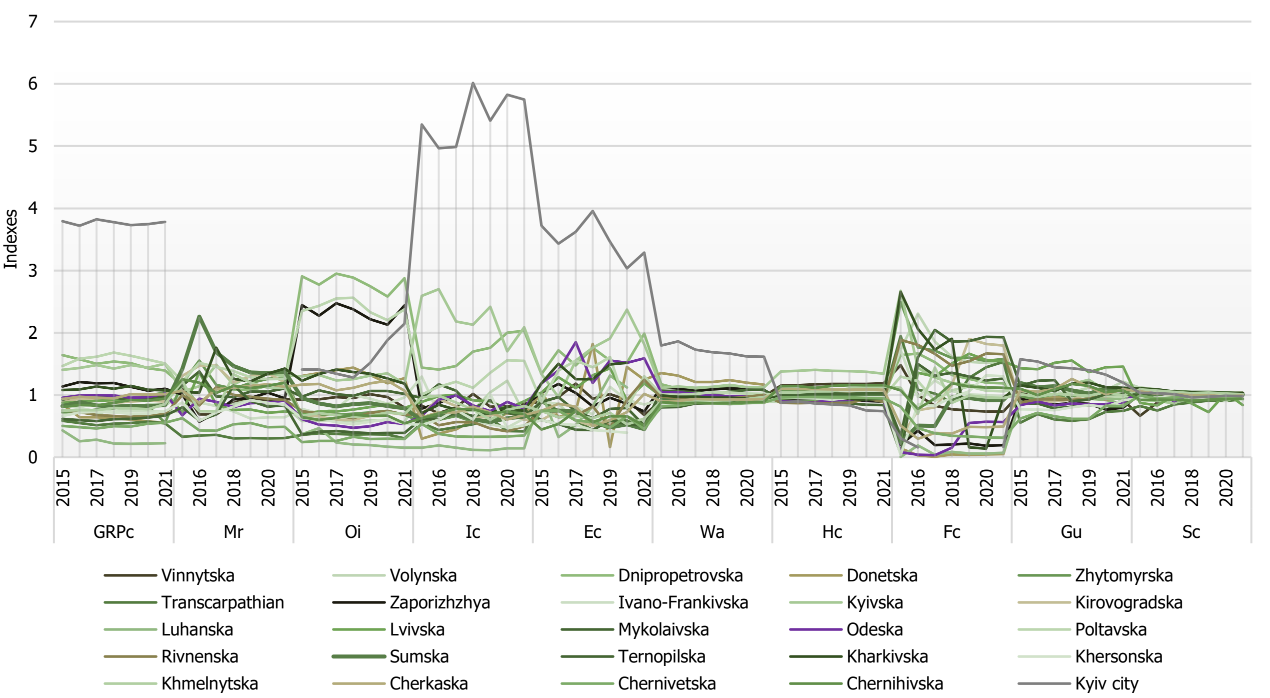

Figure 12. Economic resiliency stance of the regions of Ukraine (2015-2021). Note: GRPc - GRP index per capita, Mr - Rural out-migration index, Oi - Index of industrial output per capita, Ic - Index of capital investments (excluding investments from the state budget) per capita, Ec - Index of capital expenditures of local budgets (excluding transfers from the state budget) per capita, Wa - Index of average wages in the region, Hc - Index of total housing stock per capita, Fc - Index of the total capacity of alternative fuel boilers in the region as a percentage of the total capacity of boilers in the region, Gu - Index of graduates of secondary schools who received 160 points and above in the external independent evaluation of the Ukrainian language and literature, Sc - Index of the level of social service coverage of people in difficult life circumstances by territorial social service centres. *(Source: composed by the authors based on Regional Statistics of the State Statistics Service of Ukraine)*

This is proved by the authors of other transitive economies, who observe that comprehensive decentralization has a statistically meaningful adverse impact on the economic growth of the region (Adafre and Takele, 2023).

Year	Low level of economic resiliency by the regions	Below the average level of economic resiliency by the regions	Average level of economic resiliency by the regions	Above-average level of economic resiliency by the regions	High level of economic resiliency by the regions
2015	**1** Luganskyi	**6** Khersonkyi, Chernivetskyi, Donetskyi, Odeskyi, Ternopilyi, Zakarpaskyi	**12** Mykolaivskyi, Kirovogradskyi, Lvivskyi, Sumskyi, Chernihivskyi, Cherkaskyi, Zaporizhskyi, Rivnenskyi, Khmelnytskyi, Zhytomyrskyi, Volynskyi, Vinnytskyi	**5** Ivano-Frankivskyi, Kharkivskyi, Poltavskyi, Dnipropetrovskyi, Kyivkyi	**1** Kyiv city
2018	**1** Luganskyi	**3** Chernivetskyi, Zakarpatskyi, Donetskyi	**14** Odeskyi, Khersonskyi, Ternopilskyi, Ivano-Frankivskyi, Kirovohradskyi. Rivnenskyi, Cherkasskyi, Volynskyi, Zaporizhskyi, Khmelnitskyi, Zhytomyrskyi, Chernihivskyi, Mykolaivskyi, Vinnytskyi	**5** Lvivskyi, Kharkivskyi, Poltavskyi, Kyivskyi, Dnipropetrovskyi	**1** Kyiv city
2021	**1** Luganskyi	**3** Chernivetskyi Zakarpatskyi Donetskskyi	**15** Khersonskyi, Ternopilskyi, Zaporizhskyi, Ivano-Frankivskskyi, Volynskyi, Sumskyi, Zhytomyrskyi, Chernihivskyi, Odesskyi, Mykolaivskyi, Vinnitskyi, Khmelnitskyi, Kirovohradskyi, Rivnenskyi, Cherkasskyi	**6** Lvivskyi, Kharkivskyi, Poltavskyi, Kyivskyi, Dnipropetrovskyi, Kyiv city	-

Figure 13. Map of economic resilience of the regions of Ukraine (2015-2021).

Based on the results obtained above, two models can be simulated using Stata to answer the hypothesis defined in the paper regarding the dependence of socio-economic development on the fiscal sustainability of local budgets. The first model assesses the relationship between the level of balance of local budgets (fiscal sustainability) and the stability of tax collections, the dependence of intergovernmental grants, and the ratio of local borrowing to local budget revenues:

$$LB_k^b = -0{,}95 + 0{,}40 * T_k^s + 18{,}28 * LD_k^c + 1{,}43 * G_k^d \quad (5)$$

where – LB_k^b – is the fiscal balance ratio of local budgets; G_k^d – is the share of official intergovernmental grants from public authorities to local; LD_k^c – is the coverage ratio of local borrowings with local budgets' own revenues; and T_k^s – is the stability of tax revenue mobilization.

According to Stata results, the coefficient of multiple correlation and determination is 0.78, which means that the relationship between the factors and the outcome variable is quite strong since fiscal sustainability is determined by the influence of all its components by three quarters and by the influence of other factors by only one quarter. The model is adequate (F=2.37) and is considered accurate since the mean squared error is less than 1%.

Regression analysis shows that the debt component (fiscal solvency) has a significant impact on the sustainability of local budgets (85% of the impact), the second most important is the intergovernmental grants dependency (7% of the impact), and the third best according to the model is the stability of tax revenue collection, which determines 2% of the overall impact. The other factors that are not included in the model with this level of accuracy account for 5% of the impact. In other words, all these factors are interconnected and affect local budget revenues, so in order to achieve the sustainability of local finances, it is necessary to adjust the local public debt and budgetary adjustment policies.

The second model reflects the impact of the sustainability and solvency of local budgets on the socio-economic development of regions:

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$$ED_k^r = 0{,}91 + 0{,}91 * LB_k^b - 0{,}01 * LD_k^c \quad (6)$$

where – ED_k^r *– a composite index of the socio-economic development of regions in Ukraine;* LB_k^b *– fiscal sustainability index of local budgets in Ukraine;* LD_k^c *– fiscal solvency of local budgets in Ukraine.*

According to the Stata results, the coefficient of multiple correlation and determination is 0.75, which means that the relationship between the factors and the outcome variable is quite strong, as three-quarters of economic resilience is determined by the impact of fiscal sustainability and solvency of local budgets and only a quarter by the impact of other factors. The model is adequate (F=8.91) and is considered accurate, as the mean squared error is less than 0.5%. The partial elasticities of the model's factors clearly show that fiscal sustainability has a predominant impact.

A graphical comparison of the index of fiscal sustainability of local budgets (their balanced state) and the composite index of the resilience of their socio-economic development indicates that there is no explicit correspondence, especially in 2015-2017 (the period of crisis and recession) (Figure 14), while the fiscal solvency of local budgets is inversely proportional to the socio-economic development of the regions, which is obvious since the need for additional funding arises in the absence of proper sources of local budget revenues (taxes). This logically argues for the removal of severe restrictions on the creditworthiness of communities and for allowing local authorities to manage credit sources of fiscal capacity on their own during the crisis (through managing internal and external borrowing on beneficial conditions in the light of sustainable development policy).

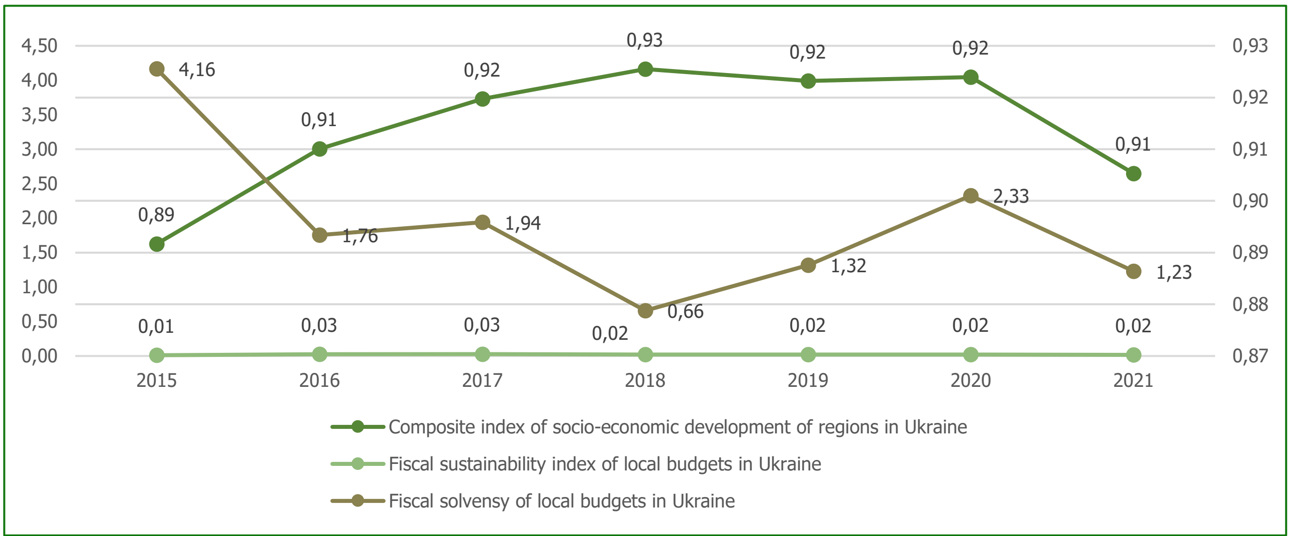

Figure 14. Fiscal Sustainability Index, Fiscal Solvency Index and Consolidated Index of Resilience of Socio-Economic Development of Regions (2015-2021).

Thus, summing up the results obtained, it can be concluded that in times of crisis and external shocks, strict compliance with the conditions of fiscal sustainability (sufficient financial resources to balance the real needs of communities) for local budgets undermines the possibility of ensuring a sustainable recovery of the regional economy. In addition, based on the experience of different countries, the achievement of fiscal sustainability in local public finances requires significant inter-governmental grants dependent on satisfying the public needs of the territories and subsidising local debts. As a result, this becomes an additional burden for the stability of the country's public finances, perpetuating the vicious circle of growing debt dependence.

Therefore, a prudent fiscal policy in a multi-level budget system should be aimed at a reasonable balance between the main sources of revenue - taxes, transfers, and loans - taking into account the potential for socio-economic development as part of the decentralisation reform, the key idea of which is to ensure financial self-sufficiency and capacity of communities.

DISCUSSION

The findings of this investigation address its objective of assessing the correlation between the fiscal sustainability of local budgets (with a focus on the borrowing component) and the economic sustainability of regions and have two research dimensions: sustainability of local public finances and sustainability of regional socio-economic development.

Initially, by identifying regulatory constraints and considering theoretical implications of the concept of fiscal sustainability of local budgets, this paper reveals that a fair and proper system of balancing the fiscal capacity of communities is determined by the following components: fiscal solvency, tax revenue stability, and intergovernmental grants dependency. These findings are a valuable addition to the current pool of existing academic insights on fiscal and economic sustainability. Neglecting the quality of fiscal capacity assessment indicators creates the risk of " hand" fiscal adjustment of horizontal equalisation and politically biased distribution of intergovernmental transfers (Yaroshevych, and Yakymiv, 2023), which affects the fiscal sustainability of local budgets.

Moreover, the results of an enhanced empirical examination of the financial sustainability of territorial communities and the overall disparity of regional economic development in Ukraine have made it feasible to reconfirm the existence of horizontal and vertical fiscal imbalances, which are both caused by and affect the level of regional development, which has been emphasised by many domestic and foreign scientists. Regional inequality in Ukraine negatively affects economic development (Verlanov, 2020), as well as the change in the structure of the economy and its most probable impact on the tax capacity of local budgets (Savchenko, 2021). The differentiational extent of local finance causes the inequality of public service provision and indicates the significant state funding participation in the local communities, therefore local governments force to find additional financial resources by local authorities using the development potential of a particular territory (Kraynik, and Fedorchak, 2022).

Secondly, our research highlights that increased decentralisation of tax revenues and expenditures contributes to the potential for sustainable regional development. However, decentralisation is more often on the expenditure side and less on the revenue side, creating "vertical fiscal imbalances", when the expenditures of subnational governments are not financed by their own revenues, which affects the efficiency of public finance (Aldasoro, and Seiferling, 2014). Constant redistribution of spending powers delegated to local budgets by the central government demonstrates the inconsistency of state policy and turbulence of the budget system, haphazard processes of vertical equalisation, and triggers chronic deficit of local budgets in Ukraine (Yaroshevych, and Yakimiv, 2023). However, given the crisis and recessionary phenomena in the economy of Ukraine this mechanism is not powerful enough, which shifts the burden on the credit and intergovernmental grant component in ensuring fiscal regions' sustainability. Domestic researchers prove the expediency of diversification of sources of budget revenues to provide municipalities with the appropriate level of sustainability in the conditions of constant changes in the economy and permanent crises (Storonyanska, et al., 2023). Considering the period of military intervention in the Ukrainian economy 2014-2022, our paper investigates whether the fiscal sustainability of local budgets (their balance) is a crucial factor in ensuring the sustainability of their socio-economic development. The empirical results obtained show that there is no clear correlation, especially during 2015-2017 (the period of crisis and recession). Ukraine has undergone significant changes due to a number of political crises, the proclamation of decentralisation reform, the military conflict in the East and the occupation of Crimea, which could not but affect regional disparities.

Therefore, our hypothesis is only partially confirmed, which means that the fiscal capacity of local budgets in the crisis period is inversely proportional to the socio-economic development of the regions. This is obvious, as there is an additional need for financing in the presence of limited internal sources of replenishment of local budgets' revenues. This finding is consistent with previous views on fiscal capacity and the sustainability of local budgets in times of stress. Thus, according to Park et al., 2022, domestic resources (including financial resources) were found to be important for the crisis management of local governments, but there was a significant decline in their perceived availability during the crisis period. It is determined that in order to smooth fiscal imbalances, it is necessary to achieve a balance of financial resources (Garyaga, and Kolodiy, 2019).

At the same time, the result contrasts with some previous studies, such as Krause, et al. 2022, which argued that economic and social resilience initiatives are at greater risk of being cut or modified during a crisis. In addition, as rightly noted by researchers of local finances in European countries (Zabler, 2021; Vértesy, 2020), specialised financial institutions were created in the Mediterranean and Scandinavian countries to provide additional resources to local budgets, while in other European countries, the state paid aid or consolidation to cover unsustainable local debts. Conversely, our results can confirm studies that show that local administrations should have different financial capacities that allow them to analyse, manage and transform the sustainability of territories (Salvador, and Sancho, 2021) since the accumulation of local changes over time leads to overcome thresholds and achieve transformations (Feola, 2015).

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Finally, despite the different existing views of the academic and professional community on the fiscal sustainability of local budgets, the findings of this research logically justify the need to remove the strict restrictions on the creditworthiness of communities and give local authorities the right to manage this source of fiscal strength by managing internal and external borrowing on beneficial terms in the context of sustainable development policy in times of crisis.

CONCLUSIONS

Thus, the conclusions of the empirical study indicate that there is a relationship between the sustainability of local budgets and the socio-economic development of regions, especially in the context of macroeconomic instability and crisis within the existing limitations of this paper (time horizon, economic cycles, regional data of the studied countries). At the same time, fiscal sustainability has a predominant influence, since the built model shows that the change in the economic sustainability of regions depends on balanced and solvent local budgets by more than a third. The chosen case also demonstrates that, in times of crisis and external shocks, strict adherence to the limited conditions of financial resource adequacy to balance the real needs of communities undermines the possibility of ensuring sustainable regional economic recovery. Moreover, based on the experience of different countries, the achievement of fiscal sustainability in local public finances requires a significant transfer dependence on covering the public needs of the regions and providing grants for local debts. Meanwhile, this imposes an additional burden on the stability of the country's public finances, thereby perpetuating the vicious circle of increasing debt dependence.

Hence, for future studies, it is needed to consider the correlation between fiscal solvency, budgetary adjustment instruments and the capability of stable tax payment in timely, prudent local decision-making and to focus on the vital influence on the sustainability of economic development of regions in every phase of the economic cycle, especially in recession and downturn. Because budget adjustment is an integral part of the broader issue of public and local debt management and sustainability.

ADDITIONAL INFORMATION

AUTHOR CONTRIBUTIONS

Conceptualization: *Hanna Kotina, Maryna Stepura*
Data curation: *Diana Matviichuk, Anna Maister*
Formal Analysis: *Diana Matviichuk, Anna Maister*
Methodology: *Hanna Kotina, Maryna Stepura*
Software: *Diana Matviichuk*
Resources: *Hanna Kotina, Maryna Stepura, Diana Matviichuk, Anna Maister*
Supervision: *Hanna Kotina, Maryna Stepura*
Validation: *Hanna Kotina, Maryna Stepura*
Investigation: *Hanna Kotina, Maryna Stepura, Diana Matviichuk, Anna Maister*
Project administration: *Hanna Kotina, Maryna Stepura*
Funding acquisition: *Hanna Kotina, Maryna Stepura, Diana Matviichuk, Anna Maister*
Writing – review & editing: *Hanna Kotina, Maryna Stepura*
Writing – original draft: *Hanna Kotina, Maryna Stepura, Diana Matviichuk, Anna Maister*

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CONFLICT OF INTEREST

The Authors declare that there is no conflict of interest.

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Котіна г., Степура М., Матвійчук Д., Майстер А.

СТІЙКІСТЬ ЛОКАЛЬНИХ ПУБЛІЧНИХ ФІНАНСІВ ТА РОЗВИТОК РЕГІОНІВ: ВИКЛИКИ Й МОЖЛИВОСТІ В КРИЗОВІ ЧАСИ В УКРАЇНІ

Соціально-економічна криза в Україні, яка поглиблюється протягом останнього десятиліття, має глибокий вплив на всі місцеві громади. Органи місцевого самоврядування, які впроваджують децентралізовані механізми та антикризові фінансові заходи, наразі стикаються з численними теоретичними й процедурними обмеженнями, які, хоч і не є однорідними, але мають кумулятивний ефект. В умовах низького економічного потенціалу та існуючих законодавчих рамок органи місцевого самоврядування не можуть активно маніпулювати стабільними джерелами надходжень до місцевих бюджетів (податками) для підтримки сталого регіонального розвитку, а тому послідовна політика кредитного й фіскального вирівнювання є важливим аспектом забезпечення стійкості місцевих публічних фінансів. Метою роботи є оцінка відповідності між фіскальною стійкістю місцевих бюджетів (з акцентом на запозиченнях) та економічною стійкістю регіонів. Результати емпіричного дослідження досвіду України на основі використання методів регресійного моделювання не виявили чіткого прямого зв'язку між рушійними силами фіскальної стійкості місцевих бюджетів (фіскальна платоспроможність, трансфертна незалежність, стабільність податкових надходжень) і сталістю соціально-економічного розвитку регіонів України.

Ключові слова: фіскальна стійкість, соціально-економічний розвиток, місцеві запозичення, фіскальна децентралізація, міжбюджетні трансферти, місцеві фінанси, місцевий борг, регіональний розвиток

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