"Financial self-sufficiency of Ukrainian territorial communities and local economic development: Modeling the causal relationship"

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FINANCIAL SELF-SUFFICIENCY OF UKRAINIAN TERRITORIAL COMMUNITIES AND LOCAL ECONOMIC DEVELOPMENT: MODELING THE CAUSAL RELATIONSHIP

Abstract

The financial self-sufficiency of communities determines their ability to create additional jobs, attract investment resources, offer quality social services, and improve the population's living standards and well-being. The study aims to identify the casual relationships between financial self-sufficiency and local economic development of Ukrainian territorial communities during economic instability. The paper used integrated assessment based on a spatial approach (identifying the level of local economic development), indicative method (calculating empirical values of financial self-sufficiency of communities), VEC model (analyzing the sensitivity of local economic development to changes in financial self-sufficiency), balanced multi-component regression method (modeling the relationship between local economic development and financial self-sufficiency). Data were gathered on all territorial communities of Ukraine in 2021. The results show that the highest level of local economic development was observed in Dnipropetrovsk oblast (empirical coefficient equal to 0.855), high levels in Kharkiv, Zaporizhzhia, Odesa, Kyiv, and Poltava oblasts (0.787; 0.687; 0.684; 0.663 each, respectively), and moderate levels in Zakarpattia (0.448) and Kirovohrad (0.433) oblasts. With increased financial self-sufficiency, local economic development can exceed 2%; a 1% increase in the decentralization of tax revenues and expenditures simultaneously leads to an increase in the attractiveness of the investment climate as an indicator of local economic development (2.3-6.6%). The study proves that the territorial communities of the regions characterized by a low level of local economic development demonstrated higher values of decentralization of interbudgetary revenues than those with higher values of local economic development.

Keywords	financial self-sufficiency, territorial communities, decentralization, local governments, modeling, local development, Ukraine
JEL Classification	O18, E62, C12

INTRODUCTION

The large-scale changes in public life caused by the spread of the pandemic and, since 2022, Russia's war against Ukraine have increased financial instability, disrupted community resilience, and forced authorities and local governments to take a new approach to the financial and socio-economic policies and economic development forecasts. Despite the challenges of the war in Ukraine, shaping a new vision of local economic development, identifying community growth points, and implementing mechanisms to ensure competitive advantage are priority areas for strategic community activities.

The decentralization reform in Ukraine (2015–2020) has enabled communities to independently accumulate and manage financial resourc-

es, make decisions and be responsible for them, create additional jobs, attract investment resources, create new high-quality social services (education, healthcare, etc.) and provide them to the population, and thus be responsible for local economic development. Accordingly, the goal of local economic development as a joint activity of local authorities, business entities, and community representatives is to create and increase the financial and economic capacity of the territory and improve the well-being of local residents. Improvement of local economic development is determined by how efficiently local governments exercise their powers and correlates with the effectiveness of programs and projects that allow communities to gain competitive advantages, create a favorable business environment, develop infrastructure, and ensure their investment attractiveness.

Financially self-sufficient communities are the foundation of local economic development. The criterion for progress is meeting the population's needs and improving living standards. These issues are important tasks and a component of the financial policy of municipalities, as the practical application of the results serves as a basis for determining their strategic development course.

1. LITERATURE REVIEW

An effective mechanism for forming and using financial resources determines a financially self-sufficient territorial community. It can independently ensure the full realization of public services for community residents and is capable of long-term self-development based on self-realization, self-government, and self-financing. The characteristic features of a financially self-sufficient community include a constant increase in its own financial resources, financial independence (autonomy), and the capacity of local governments in relations with higher-level authorities to solve the problems of financial support for the development of the territory. Moreover, such communities make autonomous solutions to local problems, have independence in the formation of local budgets and the use of budget funds without violating the norms of the current legislation, rationally use internal financial capacity, create a favorable investment climate, and effectively interact and partner with community members (Voznyak et al., 2022c).

A territorial community is a system capable of self-development, which in the process of moving toward a sustainable state, is guided by its own capabilities for self-organization, self-government, and self-financing (Voznyak et al., 2022c). Here the self-organization of the territorial community is a scientific expression of its self-movement or a process aimed at "optimizing synergy relations, streamlining processes, and forming a high synergy capacity of the system and high efficien-

cy of its functioning and development" (Spasiv, 2019; Boyle, 2016; Rushchyshyn et al., 2021). Self-financing is the ability of a territorial community to form and use its financial capacity effectively. Self-government provides for the right and ability of local governments to ensure the exercise of their own and delegated powers within their competence in the interests of community residents in the manner prescribed by law.

As demonstrated by scientific studies, research on the problems of strengthening the financial self-sufficiency of territorial communities, tools for its assessment and its importance in ensuring local economic development do not have a unified approach and views. Academic papers actively discuss the importance of financial self-sufficiency and its role in improving the well-being of community residents, what steps should be taken by local governments to make vital services more accessible to residents, what feelings determine the quality of life of residents, and whether the municipality can provide this without waiting for state aid, as well as the promotion of economic initiatives for local businesses (Vernon & Qureshi, 2000; Araftenii, 2017; Vasyltsiv et al., 2022).

The formation of the financial capacity of communities and a high level of their financial self-sufficiency is influenced by stable socio-economic relations built on the interaction of government and society and citizens and business (stakeholders) to improve the well-being of the population, strengthen economic security, and ensure the socio-economic development of the terri-

tories (Stroiko et al., 2021; Vasyltsiv et al., 2021). Strengthening the financial independence of territorial communities, including the independence from the state budget by increasing own revenues and optimizing the expenditures of local budgets, increasing investment attractiveness, and rational use of interbudgetary transfers can ensure an appropriate level of financial self-sufficiency as a basis for economic progress and development (Behrman et al., 2012; Henager & Mauldin, 2015). The features of a financially self-sufficient community include the rational use of internal financial capacity, the creation of a favorable investment climate, and the effective interaction and partnership of community residents (Gathergood, 2012; Pike et al., 2017; Shkolnyk et al., 2018; Zablodska et al., 2021). An adequate level of well-being in a territorial community guarantees high living standards. The presented arguments and the interrelationships established based on econometric modeling support the idea that the financial well-being of territorial communities is a sign of self-sufficiency of their residents (Voznyak et al., 2022a; Voznyak et al., 2022b).

Behrman et al. (2012), Gathergood (2012), Henager and Mauldin (2015), and Pike et al. (2017) determined how to achieve the financial goals of residents and thus contribute to the financial stability and well-being of the community based on the theory of psychological self-sufficiency.

The focus is on local economic development, especially given the post-war reconstruction (Voznyak et al., 2019; Khirivskyi et al., 2020a; Lupak et al., 2021; Liashenko et al., 2023). Firstly, the concepts of local economic development began to be actively used in the scientific discourse with the beginning of the decentralization reform in Ukraine. This reform resulted in the emergence of financially self-sufficient territorial communities with high financial autonomy. Secondly, financially self-sufficient communities capable of self-development and self-government are the basis for ensuring local economic development. Local economic development can be defined as a process of strategic partnership between stakeholders that helps accelerate labor productivity growth, improve the investment climate, create additional jobs, and capitalize production factors. The goal of local economic development is to ensure the community's long-term growth and improve its residents' well-being by increasing the territory's financial and economic capacity. The criteria for local economic development are:

a) participation of stakeholders;

b) joint work carried out within the administrative boundaries;

c) community residents being the participants in decision-making related to their lives;

d) local economic development aiming to improve the qualitative and quantitative parameters in the economy and well-being of the community.

Through the effective use of local budget funds, communities could create additional jobs, attract investment resources, create new high-quality social services (education, healthcare, etc.) and provide them to the population, thus ensuring local economic development. Therefore, by competing with other communities to create a favorable business environment that includes high-quality infrastructure and services at a reasonable cost for enterprises, communities can ensure the development of existing businesses, stimulate the creation of new businesses, and attract investment. Better services and a developed infrastructure will allow businesses to set lower prices for products/services while increasing sales and tax revenues and creating new jobs. Increased tax revenues because of business growth and employment development mean that communities can improve the quality of services and invest in infrastructure development, thus becoming more attractive to businesses and improving the quality of life of their citizens (Khirivskyi et al., 2020b; Horoshkova et al., 2018).

Local economic development is determined by how efficiently local governments exercise their powers. It correlates with the effectiveness of programs and projects that allow communities to gain competitive advantages and increase investment and economic capacity, including the creation of a favorable business environment, infrastructure development, the entry of new business entities into the local market, and the improvement of the investment attractiveness of communities,

which will ultimately contribute to raising living standards (Petrushenko et al., 2017; Umanets et al., 2018; Pejic Bach et al., 2020; Vasyltsiv et al., 2021).

Crisis phenomena (COVID-19, war) have intensified security factors, which, in turn, has led to the transformation of stakeholders' interests in positive changes at the local level. Moreover, given the current instability in Ukraine, an important task for local governments soon is to restore the economy and intensify their activities to achieve strategic community development goals. Given that the current crisis in Ukraine and communities is extremely challenging, unpredictable, and difficult to manage, it is time to develop approaches, measures, and tools to improve the areas of financial policy formation and implementation with the development of anti-crisis tools for local economic development. The mitigation of financial instability cannot be achieved by individual measures or instruments of a particular policy (fiscal/economic/budgetary) but requires coordination and consistency. Therefore, it is time to develop a set of tools that will serve as a reasonable basis for strategizing the development of territorial communities.

This study aims to identify the causal relationship between financial self-sufficiency and local economic development of territorial communities in economic instability.

2. METHODOLOGY

The study understands local economic development as a dynamic process of cooperation between state and local authorities, businesses, and public organizations to ensure economic growth through the progress of the business sector, including job creation and improving the quality of life. Thus, it proposes a configuration of indicators of local economic development in terms of three components:

a) attractiveness of the investment climate;
b) promotion of entrepreneurship;
c) well-being of the population.

Such a decomposition reflects the nature of local economic development. It makes it possible to build a set of empirical indicators based on the principles of validity, reproducibility, comparability, and universality of data (Table 1).

Table 1. Configuration of components and indicators for the assessment of local economic development

Components	Indicators	Measurement	Symbol
Attractiveness of the investment climate	Direct investments	million USD, per capita	$a_{1.1}$
	Reinvestment of revenues	thousands USD per operating enterprise	$a_{1.2}$
	Capital investments	USD, per capita	$a_{1.3}$
Promoting entrepreneurship	Number of operating economic entities	per 10,000 of the current population	$a_{2.1}$
	Number of employed	per operating enterprise	$a_{2.2}$
	Sold products	million UAH, per operating enterprise	$a_{2.3}$
Population well-being, including human capital development	Real income of the population	% of the previous year	$a_{3.1}$
	The ratio of income and expenditure of the population	coefficient	$a_{3.2}$
	Average wages	USD, per full-time employee	$a_{3.3}$

The information and analytical basis for the study of local economic development is formed by data on all territorial communities by regions of Ukraine as of December 2021. This is the first year of the functioning of communities on the new administrative-territorial basis, and it is also a period of increasing instability because of the COVID-19 pandemic.

Building a series of empirical parameters of local economic development requires standardizing indicators within each component according to the formula (1).

$$a_j^k = \frac{x_j^k}{x_{k\max}^n}, \qquad (1)$$

where a_j^k is the standardized value of the k indicator of j territorial communities in the region; x_j^k is the statistical value of the k indicator of territorial communities in the j region; x_{kmax}^n is the maximum value of the k indicator within the n set of territorial communities in the regions of Ukraine.

To determine the indicators' weighting coefficients, the pairwise correlation comparisons method

(building a matrix of correlation coefficients) was used (formula 2).

$$w_j^k = \frac{\sum r_l^k}{\sum \sum r_m^k}, \text{ where } \sum w_j^k = 1. \quad (2)$$

where w_j^k is the weighting coefficient of the k indicator of territorial communities of the j region; $r_{lm}^{\ k}$ is the pairwise correlation coefficient of the k indicator; l, m are the elements of rows and columns of the correlation matrix.

The conclusion about the reliability of the relationship was made using the Student's t-test, the calculated values of which exceed the table value at a given level of significance ($p < 0.05$; $p < 0.01$; $p < 0.001$) and degrees of freedom ($df = 24$).

The study proposes to calculate the composite indicators of local economic development in Ukraine by the method of linear weighting according to the formula (3).

$$LED_t^j = \sum_{i=1}^{k} a_j^k \cdot w_j^k, \quad (3)$$

where LED_n are the composite indicators of local economic development of the j territorial communities in the region.

The choice of the composite method for the construction of a series of empirical indicators of local economic development is determined by the presence of numerous indicators with different units of measurement within each component, which can be integrated into a single empirical indicator, considering their weighting and impact on the resulting variable. The spatial approach allows for identifying systemic and structural relationships between variables in the communities.

To build econometric models with the highest estimates of statistical significance, a series of empirical indicators of financial self-sufficiency of territorial communities as four dimensions of decentralization – revenues, expenditures, tax revenues, and interbudgetary relations – were constructed using the method of indicative analysis.

The ratio of revenues and expenditures of local budgets, excluding interbudgetary transfers and the consolidated local budget, is the indicator of decentralization of revenues and expenditures (formulas 4-5)

$$DD_t^n = \frac{Prof_t^n - IT_t^n}{ProfGB_t^n}, \quad (4)$$

$$DV_t^n = \frac{Outl_t^n - IT_t^n}{OutlGB_t^n}, \quad (5)$$

where DD_t^n is the level of decentralization of revenues of territorial communities of the n region in the t period; $Prof_t^n$ is the local budget revenues of the n region in the t period; IT_t^n is the interbudgetary transfers of the n region in the t period; $ProfGB_t^n$ is the revenues of the consolidated local budget of the n region in the t period; where DV_t^n is the level of decentralization of local community expenditures of the n region in the t period; $Outl_t^n$ is the local budget expenditures of the n region in the t period; $OutlGB_t^n$ is the consolidated local budget expenditures of the n region in the t period.

The ratio of tax revenues of territorial community budgets to tax revenues of the consolidated oblast budget is the level of decentralization of tax revenues (formula 6), and the share of transfers in local budget revenues is an indicator of decentralization of interbudgetary relations (formula 7).

$$DPN_t^n = \frac{PNLB_t^n}{PNGB_t^n}, \quad (6)$$

$$DIT_t^n = \frac{IT_t^n}{ProfLB_t^n}, \quad (7)$$

where DPN_t^n is the level of decentralization of tax revenues of the n region in the t period; $PNLB_t^n$ is the tax revenues of local budgets of the n region in the t period; $PNGB_t^n$ is the tax revenues of the consolidated budget of the n region in the t period; DIT_t^n is the level of decentralization of interbudgetary relations of territorial communities of the n region in the t period; $ProfLB_t^n$ is the local budget revenues of the n region in the t period.

Given the limited scientific and methodological base on this issue, the study tests whether the financial self-sufficiency of territorial communities is the foundation and the driver of local economic development determined by a high degree of sensitivity and interconnection with the parameters of the financial autonomy of communities. Therefore, the econometric study seeks to reveal the relation-
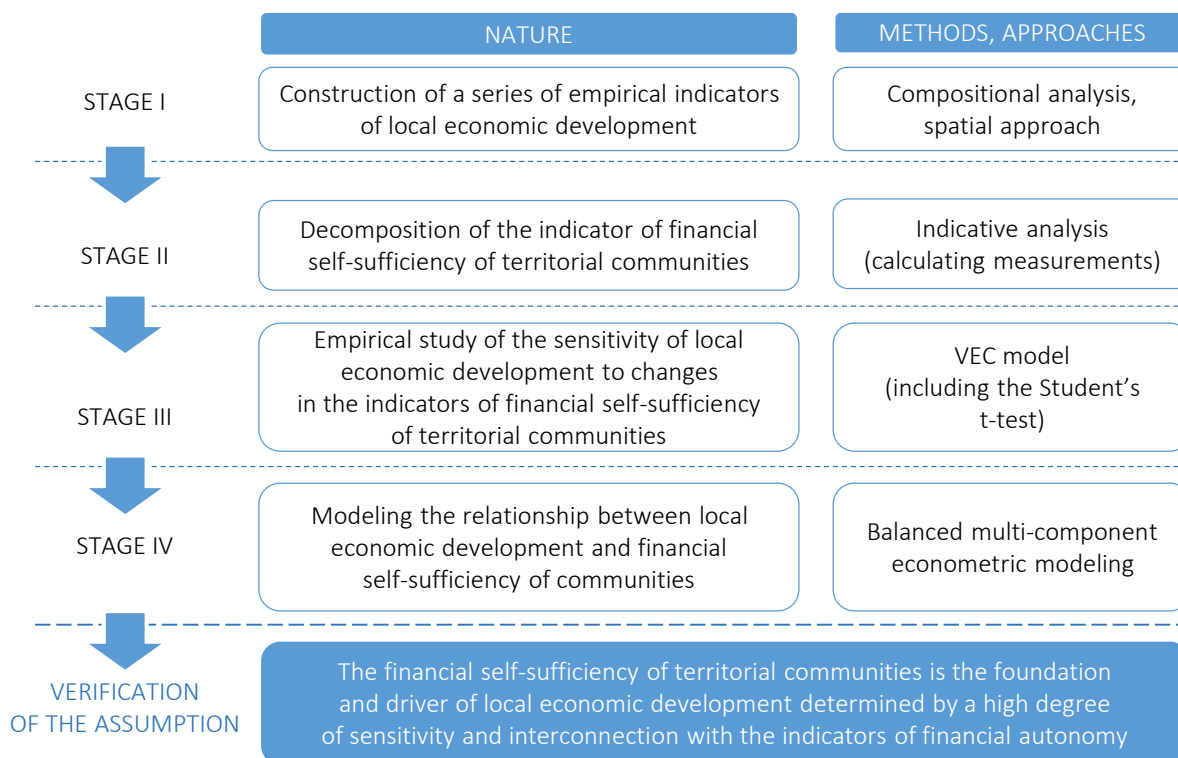
Figure 1. Methodology for studying the relationship between financial self-sufficiency and local economic development

ship between local economic development and financial self-sufficiency. This assumption is tested in four stages (Figure 1).

Identifying the degree of sensitivity of local economic development indicators in Ukraine to changes in the parameters of financial self-sufficiency of communities stipulates the use of the VEC model, which allows to determine the degree of elasticity of local economic development and financial decentralization. A balanced multi-component regression method was used to establish systemic interrelationships between local economic development and the financial self-sufficiency of communities in terms of its dimensions.

3. RESULTS AND DISCUSSION

Financially viable communities capable of accumulating investment and financial resources to meet economic interests and ensure high living standards are the trigger for local economic development.

3.1. Stage I

The normalization results within the selected data set made it possible to summarize that investment climate was the most attractive during the study period in the territorial communities of Dnipropetrovsk, Poltava, and Zaporizhzhia oblasts. In particular, the normalized values of direct and capital investment indicators in the territorial communities of Dnipropetrovsk oblast are 0.990 and 1.0, respectively. For comparison, in Zhytomyr oblast, these indicators are 0.184 and 0.380, respectively; in Vinnytsia oblast – 0.151 and 0.441, respectively; and in Ternopil oblast – 0.013 and 0.356, respectively (Table 2). The results of the normalization of the indicators of the entrepreneurship development support group are interesting, as there are no clear leaders in this group, except for Donetsk oblast, which is characterized by the highest number of employed and volume of products sold per operating enterprise (28.3 persons and USD 1,450.5 thousand). Territorial communities of Kirovohrad, Volyn, and Chernivtsi oblasts are outsiders regarding population well-being.

Table 2. Local economic development
of territorial communities in Ukraine: Indicative and spatial approach, 2021

TCs of regions	Indicators								
	$a_{1.1}$	$a_{1.2}$	$a_{1.3}$	$a_{2.1}$	$a_{2.2}$	$a_{2.3}$	$a_{3.1}$	$a_{3.2}$	$a_{3.3}$
Vinnytsia	0.151	0.441	0.116	0.598	0.621	0.513	0.998	1.000	0.841
Volyn	0.091	0.388	0.086	0.551	0.669	0.742	0.977	0.886	0.771
Dnipropetrovsk	0.990	1.000	0.028	0.916	0.764	0.897	0.968	0.922	0.920
Donetsk	0.141	0.353	0.055	0.215	1.000	1.000	0.913	0.942	1.000
Zhytomyr	0.184	0.380	0.138	0.551	0.678	0.425	0.964	0.918	0.783
Zakarpattia	0.077	0.198	0.018	0.495	0.486	0.243	0.933	0.819	0.824
Zaporizhzhia	0.595	0.525	0.289	0.860	0.618	0.496	0.952	0.901	0.928
Kyiv	0.367	0.343	0.142	0.860	0.644	0.716	1.000	0.842	0.962
Kirovohrad	0.187	0.075	0.102	0.150	0.462	0.358	0.944	0.875	0.753
Luhansk	0.002	0.466	0.008	0.776	0.781	0.338	0.948	0.925	0.820
Lviv	0.093	0.358	0.027	0.963	0.598	0.530	0.996	0.884	0.844
Mykolaiv	0.330	0.385	0.040	1.000	0.407	0.371	0.988	0.934	0.930
Odesa	0.041	0.837	0.015	0.757	0.420	0.445	0.955	0.835	0.830
Poltava	1.000	0.255	1.000	0.486	0.668	0.690	0.982	0.934	0.874
Rivne	0.220	0.340	0.125	0.542	0.608	0.341	0.969	0.957	0.859
Sumy	0.175	0.399	0.088	0.467	0.711	0.489	0.970	1.000	0.797
Ternopil	0.013	0.356	0.041	0.888	0.640	0.414	0.989	0.937	0.781
Kharkiv	0.108	0.244	0.064	0.738	0.557	0.439	0.987	0.818	0.811
Kherson	0.272	0.421	0.149	0.570	0.404	0.255	0.960	0.862	0.767
Khmelnytskyi	0.322	0.391	0.281	0.729	0.587	0.414	0.973	0.951	0.830
Cherkasy	0.385	0.183	0.208	0.439	0.554	0.582	0.973	0.878	0.806
Chernivtsi	0.013	0.413	0.017	0.598	0.508	0.236	0.965	0.836	0.753
Chernihiv	0.332	0.043	0.325	0.169	0.642	0.461	0.934	0.869	0.765
Weighting coefficients, %	13.8	10.8	7.5	9.6	10.6	14.8	7.9	10.2	14.9

In 2021, the volume of products sold (14.8%), direct investment (13.8%), and average wages (14.9%) had the strongest impact on the local economic development of territorial communities in Ukraine. Indicators such as reinvestment of revenues, the number of employed, and the ratio of income to expenditures had a moderate weight (coefficients of 10.8%, 10.6%, and 10.2%, respectively).

The results of the standardization of indicators and the calculation of weighting coefficients were used to build a series of empirical indicators of local economic development in Ukraine (Figure 2). Thus, in 2021, Dnipropetrovsk oblast had the highest level of local economic development (empirical coefficient equal to 0.855), while Kharkiv, Zaporizhzhia, Odesa, Kyiv, and Poltava oblasts had high levels (0.787, 0.687, 0.684, and 0.663, respectively). The lowest values of the empirical indicator of local economic development were recorded in Zakarpattia (0.448) and Kirovohrad (0.433) oblasts.

The management system of local finance, the tax system, and the nature of interbudgetary relations have undergone significant transformations during the period of decentralization in Ukraine. In particular, the main task of modern territorial communities is to form such a volume of financial resources and, consequently, the level of financial self-sufficiency, which would allow for economic progress, the implementation of economic tasks by business entities, conditions for human development, and the formation of a high level of financial well-being of the population. The financial self-sufficiency of communities is the foundation of local economic development. It is strengthened only by efficiently decentralizing revenues, expenditures, tax revenues, and interbudgetary revenues. Decentralization has identified priorities for
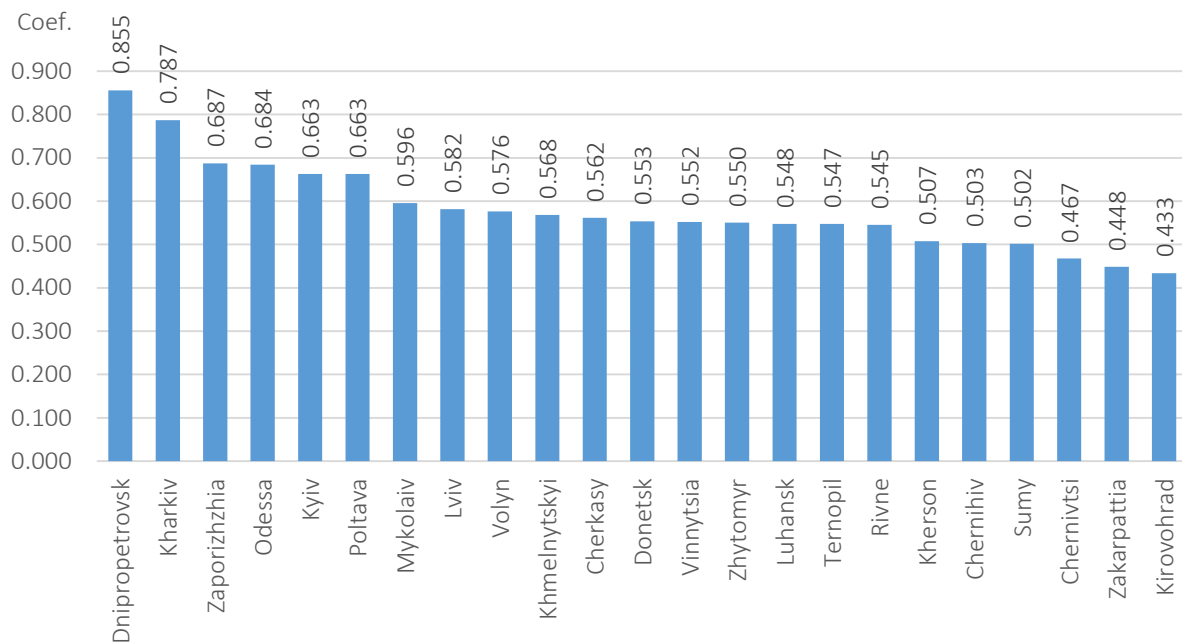
Figure 2. Local economic development in Ukraine, 2021

local economic development by changing the nature of relations between the state and local budgets, thus contributing not only to the accumulation of financial resources in territorial communities but also to their targeted allocation to those sectors of the economy whose income has led to the progress of the local economic system. This includes creating favorable conditions for attracting investment, developing infrastructure, education, and healthcare, and providing quality social services. Therefore, developing financial self-sufficiency at a high level is the main task of territorial communities.

3.2. Stage II

The calculation of the indicators of financial self-sufficiency of communities in the regions of Ukraine (Table 3) confirms a favorable impact of financial self-sufficiency on local economic development. Thus, the territorial communities of Kharkiv (0.610), Kyiv (0.602), and Odesa (0.583) oblasts had the highest revenue decentralization (as of the end of 2021), as well as the highest expenditure decentralization indicator (Kharkiv (0.607), Dnipropetrovsk (0.564), and Kyiv (0.560)). Interestingly, the territorial communities in these regions were also characterized by the highest composite indicator of local economic development (see Figure 2).

Table 3. Financial self-sufficiency of territorial communities of Ukraine: The context of decentralization, 2021

Territorial communities of regions	Indicators			
	DD	DV	DPN	DMT
Vinnytsia	0.508	0.501	0.850	0.333
Volyn	0.428	0.402	0.849	0.453
Dnipropetrovsk	0.539	0.564	0.754	0.243
Donetsk	0.510	0.476	0.782	0.301
Zhytomyr	0.492	0.464	0.850	0.363
Zakarpattia	0.388	0.350	0.852	0.514
Zaporizhzhia	0.549	0.541	0.802	0.273
Kyiv	0.602	0.560	0.848	0.260
Kirovohrad	0.510	0.492	0.844	0.339
Luhansk	0.443	0.383	0.841	0.401
Lviv	0.560	0.538	0.844	0.312
Mykolaiv	0.540	0.497	0.848	0.312
Odesa	0.583	0.553	0.865	0.294
Poltava	0.544	0.541	0.784	0.252
Rivne	0.428	0.394	0.847	0.457
Sumy	0.543	0.516	0.844	0.287
Ternopil	0.415	0.374	0.854	0.479
Kharkiv	0.610	0.607	0.902	0.239
Kherson	0.472	0.433	0.855	0.375
Khmelnytskyi	0.508	0.487	0.850	0.354
Cherkasy	0.539	0.517	0.857	0.307
Chernivtsi	0.404	0.418	0.861	0.492
Chernihiv	0.541	0.517	0.858	0.306
Oscillation rate	0.438	0.264	0.177	0.795

A similar situation is observed with assessing the decentralization of tax revenues. Territorial communities of Kharkiv (the empirical indica-

tor of decentralization of tax revenues is 0.902) and Odesa (0.865) oblasts are the leaders. Meanwhile, those regions that ranked low in the list of oblasts in terms of local economic development demonstrated above-average values of the decentralization of interbudgetary revenues (the empirical indicator was over 0.450). These are Zakarpattia, Chernivtsi, Ternopil, Rivne, and Volyn oblasts, where the rate of decentralization of interbudgetary transfers was 0.514, 0.492, 0.479, 0.457, and 0.453, respectively.

Interestingly, the share of interbudgetary transfers in the structure of local budget revenues is significant and forms the basis of financial support for the development of territories for a large number of territorial communities in the regions of Ukraine. However, the high dependence of territorial communities on interbudgetary transfers hinders the development of communities' financial self-sufficiency and an effective local finance system.

To model how the extreme limits of the obtained empirical indicators of financial self-sufficiency impact local economic development, the oscillation rate is calculated (relative fluctuation of the maximum and minimum values of financial decentralization indicators around the average value for the territorial communities of the region). The oscillation rate allows for analyzing the degree of deviation of the indicator of financial self-sufficiency of territorial communities from the national average. In particular, the oscillation rate for the indicator of revenue decentralization is 43.8%, which indicates a moderate level of variation in the revenue component of financial self-sufficiency between communities in the regions of Ukraine. The oscillation rates of decentralization of tax revenues (17.7%) and decentralization of expenditures (26.4%) characterize a slight variation in the studied indicators of financial self-sufficiency of territorial communities in the regions of Ukraine as of late 2021. At the same time, there is an above-moderate level of variation in the decentralization of interbudgetary transfers among the territorial communities of Ukraine's regions (the oscillation rate is 79.5%).

3.3. Stage III

In modern conditions, the realization of economic tasks by economic entities and, consequently, community revenues are the foundation for en-

suring the financial and economic resilience of the territory. The analysis shows that a 1% increase in the level of the revenue component of financial self-sufficiency of territorial communities (an indicator of revenue decentralization) ensures a 4.3% increase in direct investment in the region's communities, a 0.2% increase in revenue reinvestment, and about 2.0% increase in capital investment (Table 4). This indicates that an increase in community revenues has a favorable impact on the investment attractiveness. Thus, these determinants can be complementary, as an increase in the revenue component of financial self-sufficiency will help attract additional investment, and vice versa; high investment attractiveness of territorial communities is a trigger for the formation of additional sources of revenue. Therefore, investment resources are a key factor in local economic development, the main goals of which should include addressing the financial and economic challenges of territorial communities (providing the population with new or improved social services, creating new jobs, developing infrastructure, and ensuring the modernization of existing infrastructure, developing the construction sector, etc.).

The expenditure component of territorial communities' financial self-sufficiency directly impacts the volume of direct (elasticity coefficient is 2.6%) and capital (1.4%) investment. Meanwhile, a 1% increase in community expenditures leads to a 0.1% decrease in reinvested revenue. The investment role of reinvested revenue is leveled in the face of increasing expenditures of local budgets.

It is worth mentioning that the increase in the decentralization of tax revenues directly impacts investment attractiveness as an indicator of local economic development. Thus, a 1% increase in the share of local tax revenues in the consolidated budget of the region leads to an 8.2% increase in direct investment, a 2.7% increase in reinvested revenue, and a 2.5% increase in capital investment. The opposite is true for the impact of the level of decentralization of interbudgetary relations on the investment climate. The increase in basic subsidies does not contribute to the investment attractiveness of local communities and business development. The coefficient of sensitivity of interbudgetary transfers to invest-

Table 4. Sensitivity of local economic development indicators to changes in financial self-sufficiency of territorial communities of Ukraine, 2021

Indicators of local economic development	Parameters of financial self-sufficiency			
	DD	DV	DPN	DMT
Direct investment	4.280082	2.579040	8.18163	−3.70429
	(2.332762)	(1.135829)	(4.693866)	(1.732567)
	[1.834770]	[2.270623]	[1.74305]	[−2.13803]
Reinvestment of revenues	0.019365	−0.098899	2.69325	−0.130026
	(1.004918)	(0.506490)	(1.920485)	(0.764073)
	[0.019270]	[−0.19526]	[1.40238]	[−0.170174]
Capital investment	1.955660	1.384873	2.53420	−1.82952
	(1.778365)	(0.871693)	(3.612986)	(1.332983)
	[1.099695]	[1.588716]	[0.701412]	[−1.37250]
Number of operating economic entities	0.274519	−0.036785	0.447966	−0.009559
	(0.780485)	(0.394803)	(1.562585)	(0.595575)
	[0.351728]	[−0.093174]	[0.222686]	[−0.016050]
Number of employed	0.202770	0.094705	1.62845	0.194151
	(0.328266)	(0.164304)	(0.551483)	(0.246142)
	[0.008438]	[0.57640]	[2.95286]	[0.78877]
Volumes of products sold	1.319211	0.748557	3.09288	1.21253
	(0.498992)	(0.240357)	(0.932749)	(0.349433)
	[2.643753]	[3.11435]	[3.31588]	[3.46999]
Real income of the population	0.041258	0.013180	0.081019	0.018223
	(0.033840)	(0.017429)	(0.067713)	(0.026344)
	[1.2192]	[0.7562]	[1.19650]	[0.6917]
The ratio of income and expenditure of the population	0.031797	0.030313	0.324714	0.025925
	(0.087740)	(0.043904)	(0.160997)	(0.066726)
	[0.362396]	[0.690427]	[2.01689]	[0.388535]
Average wages	0.224348	0.112083	0.665140	0.202576
	(0.110728)	(0.055963)	(0.193593)	(0.080815)
	[2.02611]	[2.00279]	[3.43577]	[2.50667]

Note: standard error is in round brackets; Student's t-test is in square brackets; calculated using EViews 11 software.

ment attractiveness indicators is reversed and amounts to 3.7% for direct investment, 0.1% for reinvestment of revenues, and 1.8% for capital investment.

The modeled situation of sensitivity of the conditions for the promotion of entrepreneurship and financial self-sufficiency of communities in the regions of Ukraine demonstrates a moderately favorable nature of the sensitivity of the indicators. For example, a 0.3% increase in the number of operating economic entities can be achieved by increasing the revenue component of financial self-sufficiency of communities by 1% and only 0.03% by reducing the expenditure component by 1%. Interestingly, the number of economic en-

tities in territorial communities is most sensitive to decentralizing tax revenues (0.4% impact). The lowest sensitivity and reverse relationship are observed with the level of decentralization of inter-budgetary transfers (0.01%).

Changes in the number of employed in territorial communities are most sensitive to the decentralization of tax revenues. A 1% increase in the decentralization of tax revenues will lead to a 1.6% increase in the number of employed. The number of employed has a moderate degree of elasticity with the decentralization of revenues and interbudgetary revenues (0.2% each). The expenditure component of financial self-sufficiency has the lowest impact on the indicator (0.09%).

A 1.3% increase in the volume of products sold can be expected if revenue decentralization increases by 1%. If tax revenue decentralization increases by 1%, the expected growth in product volume will be 3.1%. The indicator of the volume of products sold demonstrates the lowest sensitivity to changes in the decentralization of expenditures (0.7%). Thus, a favorable business environment as an indicator of local economic development will help create new jobs, increase sales, boost profitability, and increase tax payments. Accordingly, the entrepreneurial sector, including private business, significantly contributes to the growth of well-being and improvement of the quality of life in the territorial communities of Ukraine.

The high level of financial self-sufficiency of territorial communities has only a positive impact on the well-being of the population and human development. Naturally, increasing the financial self-sufficiency of communities allows for the economic development of the territory by increasing the number of economic entities, thus creating new jobs, realizing the interests of community members, and developing social infrastructure, ultimately improving the population's well-being. Thus, modeling the sensitivity of financial self-sufficiency to community well-being confirms this assumption. In particular, a 0.04% increase in real income of the population depends on a 1.0% increase in revenue decentralization. A 1% increase in tax revenue decentralization will result in a 0.1% increase in the income of the population in the community.

The indicator "Ratio of income and expenditures of the population" is one of the most indicative parameters of the environment of ensuring the well-being of the population of territorial communities, which is formed and developed correlatively depending on the community's financial self-sufficiency. Therefore, the highest rate of the ratio of income and expenditures can be achieved through the impact on the financial self-sufficiency of the community in the context of increasing decentralization of tax revenues. The modeled result is 0.3%, giving local budgets a 1% increase in tax revenues. If other indicators of financial self-sufficiency increase by 1%, the ratio of income to expenditures can be expected to reach 0.03%.

Wages are one of the most important indicators of economic growth and the well-being of the population. Suppose there is a high level of wages in the territorial communities. In that case, the level of consumption increases, the level of well-being rises, and, as a result, high living standards are formed. The analysis of the sensitivity of average wages and indicators of financial self-sufficiency of communities in Ukraine's regions confirms the complementary nature of their impact. Naturally, average wages are the most sensitive to changes in the level of decentralization of tax revenues. For example, a 1% increase in the decentralization of tax revenues leads to a 0.66% increase in average wages. Wages show the lowest sensitivity to the expenditure indicator of financial self-sufficiency (0.11%).

On the one hand, local economic development is a result of and, on the other hand, depends on the amount and efficiency of financial resources. Modeling the resource base of local economic development will help identify opportunities for increasing the financial self-sufficiency of communities and determine potential risks of accomplishing local economic development tasks depending on the level of financial capacity of territorial communities.

3.4. Stage IV

The balance model shows that the rate of local economic development at the level of 0.6% can be achieved by increasing the revenue indicator of financial self-sufficiency of communities by 1%.

$$LED_t^n = \overset{0.268}{\left(1.696^*\right)} + \overset{0.609}{\left(1.968^{**}\right)} DD_t^n \,, \quad (8)$$

$$R_{adj}^2 = 0.874 \qquad DW = 1.94$$

where LED_t^n is the local economic development of region n in period t. Indicators of local economic development previously logarithmized and checked for the absence of multicollinearity are the elements of the LED_t^n vector.

Empirical estimates show that the impact of the expenditure indicator of financial self-sufficiency on local economic development is favorable and amounts to 0.3% (formula 9). The statistical relationship between the decentralization of expenditures and local economic development can be traced at the level of statistical significance of 99%.

$$LED_t^n = \begin{matrix} 0.420 & 0.336 \\ (5.705^{**}) + (2.197^{***})DV_t^n \end{matrix} \quad (9)$$
$$R_{adj}^2 = 0.974 \qquad DW = 2.05$$

Interestingly, an increase in the level of decentralization of tax revenues has the greatest impact on local economic development compared to other indicators of financial self-sufficiency of territorial communities (formula 10). In particular, according to the modeling results, a 1% increase in this indicator leads to a 7.6% increase in local economic development.

$$LED_t^n = \begin{matrix} 2.627 & 7.587 \\ (7.587^{***}) + (5.927^{***})DPN_t^n \end{matrix}. \quad (10)$$
$$R_{adj}^2 = 0.791 \qquad DW = 2.15$$

If territorial communities have insignificant amounts of financial resources and, therefore, a low level of financial capacity, their ability to implement economic goals and objectives of local development is limited. Therefore, the basic subsidies become the basis for meeting the economic needs of the community rather than an instrument of economic development, as confirmed by the results of the balance regression modeling (formula 11). An increase in interbudgetary transfers by 1.0% leads to a decrease in local economic development by 0.7%.

$$LED_t^n = \begin{matrix} 0.801 & 0.651 \\ (10.596^{***}) - (3.058^{***})DMT_t^n \end{matrix}. \quad (11)$$
$$R_{adj}^2 = 0.885 \qquad DW = 2.09$$

The modeling results confirm that local economic development is highly dependent on the level of financial self-sufficiency (autonomy) of communities and efficient financial management. The financial self-sufficiency of territorial communities is a trigger for the economic development of the territory, the pace of which correlates with the efficiency of implementing financial and economic instruments for increasing the financial resources of communities. For example, the effectiveness of budgetary instruments for increasing the financial self-sufficiency of territorial communities (formula 12) and, consequently, an increase in the decentralization of tax revenues by 1.0% (statistical significance is 99%) will guarantee an increase in the local economic development by 2.3% provided that the decentralization of revenues increases by 0.5%.

$$LED_t^n = \begin{matrix} 2.301 & 2.374 \\ (7.411^{***}) + (6.833^{***})DPN_t + \end{matrix}$$
$$R_{adj}^2 = 0.864$$
$$+ \begin{matrix} 0.538 \\ (3.091^{***})DD_t. \end{matrix} \quad (12)$$
$$DW = 2.41$$

The constructed multi-component econometric model used the method of stepwise F-exclusion. The result shows that a 1% increase in the decentralization of tax revenues (statistical significance is 99%) and expenditures (statistical significance is 95%) leads to an increase in the attractiveness of the investment climate of territorial communities in the regions of Ukraine at 2.3% to 6.6% as an indicator of local economic development (formula 13). It is worth mentioning that the impact of other components of financial self-sufficiency of territorial communities on the growth of the investment climate attractiveness is leveled.

$$Inv_t^{LED} = \begin{matrix} 6.250 & 2.283 \\ (1.614^{*}) + (2.032^{**})DV_t + \end{matrix}$$
$$R_{adj}^2 = 0.645$$
$$+ \begin{matrix} 6.564 \\ (1.475^{***})DPN_t, \end{matrix} \quad (13)$$
$$DW = 1.78$$

where Inv_t^{LED} is the level of attractiveness of the investment climate in territorial communities in period t.

Interestingly, creating a favorable business environment as a determinant of local economic development is most strongly influenced by the decentralization of tax revenues (formula 14). For example, a 1% increase in the decentralization of tax revenues will make it possible to provide a more favorable business environment in communities by 3.1% (statistical significance of 99%).

$$BS_t^{LED} = \begin{matrix} 5.426 & 3.093 \\ (6.913^{***}) + (3.316^{***})DPN_t, \end{matrix} \quad (14)$$
$$R_{adj}^2 = 0.789 \qquad DW = 2.32$$

where BS_t^{LED} is the level of promotion of entrepreneurship in territorial communities in period t.

$$1.900 \qquad 0.187 \qquad 0.116$$
$$QL_t^{LED} = \left(23.876^{***}\right) + \left(1.784^{***}\right)DD_t + \left(1.464^{**}\right)DMT_t, \qquad (15)$$
$$R_{adj}^2 = 0.901 \qquad DW = 2.18$$

where QL_t^{LED} is the level of well-being of the population, including human capital development, in the territorial communities in period t.

The results of the modeling show that the rapid growth of the population's well-being cannot be ensured by increasing the financial self-sufficiency of territorial communities, as the impact on the resulting variable is minor (formula 15). For example, a 1% increase in the decentralization of revenues and interbudgetary transfers will only ensure higher living standards in the 0.1% to 0.2% range.

Therefore, the current levels of financial self-sufficiency and local economic development in Ukraine require the determination of a strategic course for territorial communities to implement policies to ensure financial sustainability and autonomy with a focus on building investment capacity, ensuring financial and economic resilience against external and internal challenges and threats to the economic interests of economic entities, and preserving and developing the economic power of the territory.

CONCLUSION

The study aims to test whether the financial self-sufficiency of territorial communities is the foundation and driver of local economic development determined by a high degree of sensitivity and interconnection with the parameters of financial autonomy. The empirical indicators of local economic development show that the local economic development of territorial communities in Ukraine in 2021 was most influenced by the volume of products sold, direct investment, and average wages. The highest local economic development level was recorded in the territorial communities of Dnipropetrovsk oblast, and high levels were in Kharkiv, Zaporizhzhia, Odesa, Kyiv, and Poltava oblasts. The territorial communities of Zakarpattia and Kirovohrad oblasts demonstrated the lowest values of local economic development. The decomposition of the indicator of financial self-sufficiency of territorial communities through the dimensions of decentralization (revenues, expenditures, tax revenues, interbudgetary transfers) reveals that the highest level of financial self-sufficiency characterized the territorial communities of Kharkiv and Odesa oblasts.

The modeling of the relationship between local economic development and financial self-sufficiency of communities by the balance regression method shows that it is possible to ensure the rate of local economic development at the level of 0.6 % if the revenue dimension of financial self-sufficiency of communities increases by 1 %. The increase in the decentralization of tax revenues has the greatest impact on the rate of local economic development compared to other indicators of financial self-sufficiency of territorial communities. The increase in interbudgetary transfers by 1.0% leads to a decrease in local economic development by 0.7%. The results of the multi-component modeling allowed establishing that with the strengthening of financial self-sufficiency, the pace of local economic development can reach 2.3%; the increase in the decentralization of tax revenues and expenditures simultaneously leads to an increase in the attractiveness of the investment climate of territorial communities as an indicator of local economic development.

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