

# Impact of Municipal Financial Resilience on Sustainable Economic Development: Case of Ukraine

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**Abstract:** Reform of fiscal decentralization is one of the most effective modern tools to improve the efficiency of public and local finances, as it involves the transfer of some powers from central to sub-central governments according to the principle of subsidiarity. Therefore, one of the top priorities in public finance development nowadays is to ensure municipal financial resilience (financial capacity). In the paper it is proposed to measure municipal financial resilience (financial capacity) as an integral indicator of fifth parameters (ratio of revenue / cost / tax revenue of local budgets (excluding transfers) to revenue / cost / tax revenue of the consolidated budget, "1" reduced by the ratio of net intergovernmental transfers to own revenue of local budgets; ratio of own revenue of local budgets to their own expenditure) aggregated based on Fishburn formula. It is proposed to chose as a proxies of municipal sustainable economic development such indicators as consumer price index, current account balance, volume of credits to the private sector, net foreign direct investment, GDP growth, GDP per capita, gross capital formation, business density, employment ratio, R&D expenditures, trade turnover. Testing the hypothesis on relationship between municipal financial resilience (financial capacity) and its economic development is realized on data for Ukraine for the period 2008–2021. Method of modelling – regression analysis in Stata software. Based on the empirical research results it might be concluded that there are national peculiarities of relationship between municipal financial resilience (financial capacity) and its sustainable economic development in Ukraine, which might be considered in terms of fiscal decentralization reform implementation, counteraction to negative consequence of coronavirus disease pandemic and municipality post-pandemic recovery strategy.

**Keywords:** Fiscal decentralization, municipal, financial capacity, financial resilience, sustainable development, economic growth, regression analysis.

## 1. INTRODUCTION

Reform of fiscal decentralization is one of the most effective modern tools to improve the efficiency of public and local finances, as it involves the transfer of some powers from central to sub-central governments according to the principle of subsidiarity. Thus, local governments get a wider range of powers, which allows them to accumulate financial resources to local budgets and redistribute it more autonomously and provide local community members with better public services provision. However, despite the theoretical benefits of implementing fiscal decentralization reform for both central to sub-central governments, some researchers, point out its negative effects in the macroeconomic imbalance due to the

lack of centralized budget management, insufficient competence of administrative staff of sub-central governments, deepening inequalities in regional development and underfunding of projects covering several administrative jurisdictions.

Given the ambiguity of the views of scholars and practitioners regarding the practical consequences of the reform of fiscal decentralization on the overall economic development of the state, there is an objective need for deeper scientific research in this area. In particular, the aim of the research is to reveal the relationship between municipal financial resilience (financial capacity) and proxies of its sustainable economic development.

It is worth noting that the problem of empirical formalization of the impact of municipal financial resilience (financial capacity) on certain indicators of region and country economic development are in the focus of scientific interests of many

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researchers. Thus, investigated the relationship between the measures of fiscal decentralization and economic growth in 16 countries of the Central and Eastern Europe for the period 1990–2004 using panel data regression analysis (dynamic effects model). The results showed, in contrast to most empirical studies, the presence of a negative impact of the selected factor variables on the dependent indicator. At the same time, the introduction of time lag revealed differences between the results of modeling in the short and long term, as well as their significant variation within geographic sample. In addition, the authors confirmed that cost decentralization is negatively correlated with sustainable economic growth, but tax revenue decentralization changes its impact from negative to positive with increasing time lag. Thus, the researchers conclude that local communities with a higher level of fiscal autonomy are more resistant to macroeconomic instability and create a background for economic growth in the whole country.

In turn, realized familiar empirically research for a sample of 23 member countries of the Organization for Economic Cooperation and Development (OECD) for the period 1972–2005 and found that cost decentralization is usually accompanied with a slowdown in economic growth, while revenue decentralization triggers more intensive economic returns. In addition, researchers emphasize that the prerequisite for ensuring high economic growth is the synchronization of trends and scales of cost and revenue decentralization.

However, researched the impact of tax autonomy on economic growth for the sample of 23 OECD member countries for 1975–2008 and empirically confirmed the hypothesis on the existence of negative and statistically significant relationship between the level of tax autonomy and economic growth. Scholars note that the identified patterns should be taken into account in the development and implementation of fiscal decentralization reform.

Moreover, and realized a research on clarification of local budget financial capacity essence and assessment. Basically, authors pointed out that it consists of three integral parts such as financial sufficiency, financial autonomy and financial potential. In turn, local budget financial sufficiency scholars proposed to measure via ratio of adequacy of own funds, ratio of adequacy of enshrined financial resources, and ratio of local budget coverage. It is proposed to assess local budget financial autonomy with ratio of own revenues concentration, ratio of own and enshrined revenues concentration, and ratio of subsidized dependency of local budgets. Finally, local budget financial potential might be measured through ratio of revenues capacitance, ratio of investment capacitance, and ratio of municipal enterprises profitability.

drew attention to the role of social, environmental and digital determinants of enterprises' activity in financial and socio-economic development of local communities. This led us to the conclusion that spending policy of sub-central government might be built considering Sustainable Development Goals – with prioritizing of environmental protection, responsible consumption and resources usage, food security and social responsibility.

It also should be noted that researched preconditions of economic prosperity of two local communities (Stellenbosch

and Drakenstein), located in Cape Winelands District municipality in Western Cape, South Africa. Scholars pointed out that local community development not only depends on financial capacity but also sub-central government personnel professional development. Therefore, it became crucially important to spend some local budget money on personnel development in order to ensure local community economic growth, especially in terms of decentralization reform implementation that is associated with high-scale staff allocation and career progression led to the familiar conclusions based on the research of problems of finance teaching in Ukraine in the post-crisis period, while highlighted the importance of the complex transformation of educational system in order to achieve sustainable development both at country and municipal level.

## 2. RESEARCH METHOD

In order to reveal relationship between municipal financial resilience (financial capacity) and proxies of its sustainable economic development it is needed to identify the most appropriate measurement indicators of municipal financial resilience (financial capacity). Thus, a detailed analysis of indicators are used by scholars in empirical studies showed that there are two the most popular indicators of municipal financial resilience (financial capacity) measurement such as revenue decentralization (ratio of local budget revenue (excluding transfers) to consolidated budget revenue) and cost / expenditure decentralization (ratio of local budget expenditures (excluding transfers) to consolidated budget expenditures). Given the above, these two indicators are selected to the measurement system of municipal financial resilience (financial capacity).

In addition, considering the importance of tax revenues in maintenance of effective functioning of local governments, it is advisable to include to the data set of measurement of municipal financial resilience (financial capacity) an indicator of tax autonomy (ratio of tax revenue of the local budget to tax revenue of the consolidated budget).

At the same time, the state of municipal financial resilience (financial capacity) depends not only on the quality of revenue generation and efficiency of budget spending but also on the dependence of local budgets on grants from the state budget. The indicator of local budget financial independence calculated as "1" reduced by the ratio of net inter-budget grants (the difference between received and transferred inter-budget grants) to own revenues of local budgets.

The last indicator of municipal financial resilience (financial capacity) measurement system is the coefficient of coverage of local budget own expenditure by their own revenue. The importance of the choice of this parameter is explained by the fact that in terms of the municipal financial resilience (financial capacity) evaluation it is important to analyze the level of revenue-to-expenditure balance of local budgets not only within delegated but also own powers.

At the next stage of the research in order to substantiate the correctness of the choice of the above-mentioned indicators of municipal financial resilience (financial capacity), the Cronbach's alpha test is used. It helps to clarify the internal consistency of these parameters by calculating different cor-

relation coefficients, which allow formalizing the relationship of each partial indicator with a composite indicator formed from all selected indicators.

Considering the fact that the selected municipal financial resilience parameters are not equivalent, the next stage of this approach is aimed at ranging of the selected indicators based on individual assessment method. Thus, it should be noted that in order to differentiate the level of significance of these five elements of assessing the local community financial capacity, 23 experts on budget policy were asked to assign ranks from 1 to 5 respectively (1 characterizes the lowest level of significance in the context of ensuring local community financial capacity, 5 – the largest). At the next stage of the research it is proposed to identify weights for each of the indicators based on the results of individual assessment method. In order to create composite indicator of municipal financial resilience (financial capacity) it is used Fishburn formula considering weight coefficients that are identified at previous stage of the research. Relevance of Fishburn formula is proved.

It also should be noted that testing the hypothesis on relationship between municipal financial resilience (financial capacity) and sustainable economic growth indicators is realized based on regression analysis.

Basically, a set of independent variables of this empirical study might consists of composite indicator of municipal financial resilience (financial capacity) (GFA) as well as its five components: FA1 / FA2 / FA3 – the ratio of revenue / cost / tax revenue of local budgets (excluding transfers) to revenue / cost / tax revenue of the consolidated budget, units; FA4 – "1" reduced by the ratio of net intergovernmental transfers to own revenue of local budgets, units; FA5 – the ratio of own revenue of local budgets to their own expenditure, units. The sample of independent variables is formed from the data collections.

Thus, a set of dependent variables (measures of sustainable economic development) consist of the next indicators: CPI – consumer price index; CAB – current account balance (USD); Cr – volume of credits to the private sector (% of GDP); FDI – net foreign direct investment (USD); GDPg – GDP growth (%); GDPpc – GDP per capita (USD); GCF – gross capital formation (USD); D – business density (number of new registered business structures per 1,000 people aged 15 to 64); Em – the ratio of the employed population to the total population over the age of 15 years (%), according to the methodology of the International Labour Organization; R&D – expenditures on research and development (% of GDP); Tr – turnover (% of GDP). All these indicators were collected from the World Development Indicators collection.

Relevance of the choice of such indicators as proxies of country sustainable economic development is grounded on scientific research, specifically:

- GDP as a core measurement indicator of macroeconomic stability and sustainable economic development is mentioned in papers [1], [3], [4], [17], [25], [32], [36], [37], [41], [43], [44], [45], [49], [52], [53];
- consumer price index – in [25], [26], [32];

- foreign direct investment – in [18], [20], [26], [32], [49];
- current account balance – in [32], [36], [37], [43];
- volume of credits to the private sector – in [5], [6], [19], [51];
- gross capital formation – in [18], [32];
- business density – in [15], [18], [21], [25];
- employment ratio – in [3], [7], [8], [10], [25], [32], [42];
- R&D expenditures – in [34], [35];
- trade openness / trade turnover – in [9], [21], [48].

Traditionally, in economic growth models in addition to independent variables it is included also control variables. Therefore, the set of control variables in the context of this study consists of relevant macroeconomic indicators that are not used as a dependent variable.

The time horizon of the study covers the period 2008–2021 (or the last period of availability of statistical data).

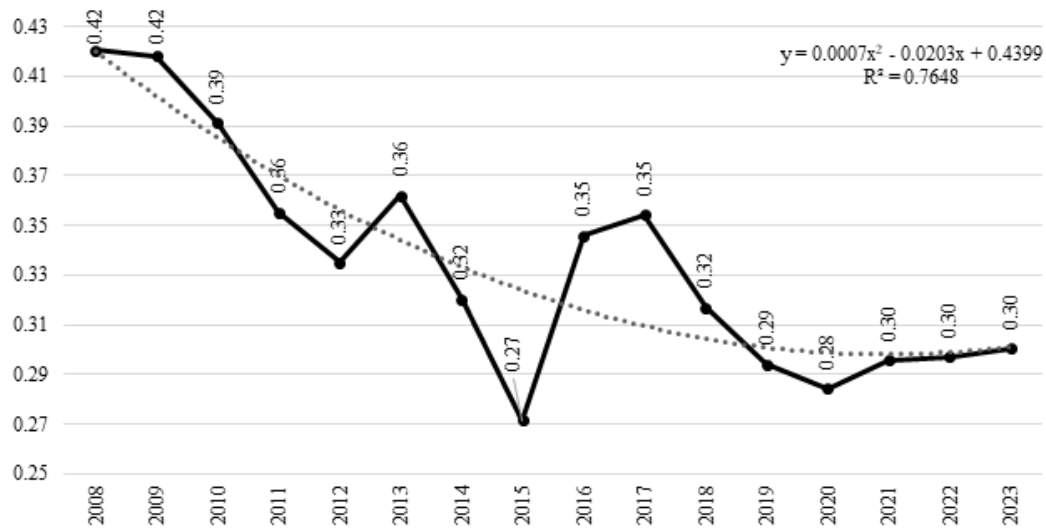
### 3. RESULTS AND DISCUSSION

In order to identify the consistency of municipal financial resilience (financial capacity) measurement indicators it is used the Cronbach's alpha test. According to the results of this stage, it is found that the elimination from the composite indicator of municipal financial resilience (financial capacity) of each of the five selected indicators leads to the deterioration of internal consistency. Thus, the results of the Cronbach's alpha test indicate a high level of internal consistency of selected partial indicators.

At the next stage of the research, it is identified relevance of municipal financial resilience (financial capacity) measurement indicators based on individual expert assessments. Specifically, indicators of cost and revenue decentralization based on the results of generalization of the method of individual expert evaluations received approximately the same number of points (the level of revenue decentralization 18 experts evaluated in "5" points, 4 – in "4" and 1 – in "3", 109 points in total; while the level of cost decentralization assessed by 17 experts in "5" points, 4 – in "4", 1 – in "3" and 1 – in "2"; 106 points in total). Therefore, these indicators are decided to consider as equivalent and assign them the highest rank – 4 (a total of five indicators are included in the system, but two of them are at the same level, and therefore the system will no longer have five but four ranks). The rest of the indicators are ranked according to the level of significance as follows: rank 3 – the level of tax autonomy (88 points from experts), rank 2 – the level of independence from intergovernmental transfers (74 points from experts); rank 1 – the ratio of coverage of own cost of local budgets by its own revenue (66 points from experts).

Thus, taking into account the ranks of each of the five indicators determined by the experts, its hierarchy identified as follows:

$$FA_1 \approx FA_2 > FA_3 > FA_4 > FA_5 \Rightarrow 4 (FA_1, FA_2), 3 (FA_3), 2 (FA_4), 1 (FA_5) \quad (1)$$



Source: authors' calculation.

**Fig. (1).** Dynamics of composite indicator of municipal financial resilience (financial capacity) in Ukraine in 2008–2023, units.

Considering ranks identified in formula (1), composite indicator of municipal financial resilience (financial capacity) is calculated with formula (2):

$$GFA = \frac{4}{14} FA_1 + \frac{4}{14} FA_2 + \frac{3}{14} FA_3 + \frac{2}{14} FA_4 + \frac{1}{14} FA_5 \quad (2)$$

Dynamics of composite indicator of municipal financial resilience (financial capacity) in Ukraine (calculated indicator for 2008–2021 and a forecast for 2022–2023) are presented on Fig. (1).

To test the hypotheses on the positive impact of the composite indicator of municipal financial resilience (financial capacity) and its elements on indicators of municipal sustainable economic development, it is used regression modelling using the Stata 12/SE software. The regression modelling results are presented in Table 1.

Thus, the analysis revealed that the greatest impact on the parameters of sustainable economic development has strengthening of independence from intergovernmental transfers, which reduces the inflow of foreign direct investment, the density of the business network, GDP growth, but stimulates the expansion of gross capital formation. An increase of the ratio of coverage of local budget own expenditure by own revenue causes a decrease in GDP per capita, but also restrains inflation, intensifies the processes of lending to the private sector and increases employment. In turn, the increase in the level of revenue decentralization and tax autonomy causes a slight reduction in business network, but also restrains inflation and intensifies credit expansion. On the other hand, the expansion of cost decentralization in Ukraine has a statistically significant impact only on the growth of trade. At the same time, the improvement of the composite indicator of municipal financial resilience (financial capacity) also has a positive effect on the scale of gross capital formation and lending to the private sector, but reduces the activity of creating new enterprises.

#### 4. CONCLUSIONS

Summarizing the results of regression analysis, it can be noted that this block of research confirmed the presence of domestic specifics in modelling the impact of the composite indicator of municipal financial resilience (financial capacity) and its elements on sustainable economic development. In particular, it was found that such elements of the composite indicator of municipal financial resilience (financial capacity) as the level of independence from intergovernmental transfers and the ratio of coverage of local budgets own expenditure to their own revenue do not have a statistically significant impact on macroeconomic parameters of European countries, but are important for Ukraine. It should also be noted that cost decentralization is not characterized by a large significance for Ukraine. In turn, the hypotheses about positive impact of revenue decentralization is partially confirmed for Ukraine. The identified patterns should be taken into account when reforming the system of local finances in Ukraine and also might be valuable in counteraction to negative consequence of coronavirus disease pandemic in terms of municipality post-pandemic recovery.

#### DECLARATION OF COMPETING INTEREST

The authors declare that they have no any known financial or non-financial competing interests in any material discussed in this paper.

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**Table 1. The results of Modelling of the Impact of the Composite Indicator of Municipal Financial Resilience (Financial Capacity) and its Components on the Indicators of Sustainable Economic Development in Ukraine for 2008-2021.**

Dependent Variable	Coefficient	t-value	p-value	R <sup>2</sup>	CP
Indicators of economic development for which the influence of the composite indicator of municipal financial resilience (financial capacity) is confirmed (GFA)					
GCF	10,7·10 <sup>11</sup>	8,03	0,079	0,996	90 %
D	-1,95	-19,79	0,032	0,999	95%
Cr	113,73	6,11	0,103	0,998	90 %
Indicators of economic development for which the influence of revenue decentralization is confirmed (FA <sub>1</sub> )					
D	-0,076	-21,61	0,029	0,999	95 %
CPI	-4,36	-12,41	0,051	0,999	95 %
Cr	2,41	6,12	0,102	0,998	90 %
Indicators of economic development for which the influence of cost decentralization is confirmed (FA <sub>2</sub> )					
Tr	2,60	5,83	0,100	0,986	90 %
Indicators of economic development for which the influence of tax autonomy is confirmed (FA <sub>3</sub> )					
D	-0,029	-11,94	0,053	0,999	95 %
CPI	-3,145	-5,83	0,100	0,999	90 %
Cr	1,48	6,12	0,102	0,998	90 %
Indicators of economic development for which the influence of independence of intergovernmental transfers is confirmed (FA <sub>4</sub> )					
FDI	-4,85·10 <sup>10</sup>	-34,68	0,018	0,999	99 %
GCF	2,77·10 <sup>11</sup>	5,83	0,100	0,992	90 %
D	-0,51	-14,40	0,044	0,999	95 %
GDPg	-28,45	-6,73	0,094	0,999	90 %
Indicators of economic development for which the influence of the ratio of coverage of local budget own expenditure by own revenue is confirmed (FA <sub>5</sub> )					
GDPpc	-22300,00	-19,50	0,033	0,999	95 %
CPI	-751,05	-15,44	0,041	0,999	95 %
Cr	117,94	12,74	0,050	0,999	95 %
Em	31,69	11,68	0,054	0,999	95 %

Notes: R<sup>2</sup> is the coefficient of determination of the model; CP - confidence probability of significance of the first regressor; CPI - consumer price index (base - prices in 2010); Cr - volume of loans to the private sector (% of GDP); GCF - gross capital formation (USD); GDPg - GDP growth (%); GDPpc - GDP per capita (USD); FDI - net inflow of foreign direct investment (USD); D - business density (number of new registered business structures per 1,000 people aged 15 to 64); Tr - turnover (% of GDP).

Source: authors' calculation

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