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PUBLIC SPENDING AND SUSTAINABLE ECONOMIC GROWTH IN TIMES OF CRISIS: EMPIRICAL TESTING OF DEVELOPED COUNTRIES

ABSTRACT

Improving planning and increasing the efficiency of public expenditures, as well as determining their optimal structure, are crucial tasks for a country's development. However, these tasks become significantly more complex under conditions of uncertainty and are particularly relevant during economic crises. This study examines the characteristics and trends of the impact of public spending on economic growth during crisis periods in developed countries. A systematic methodological approach is applied in combination with statistical research methods. Several authorial hypotheses have been confirmed: according to Wagner's law, an increase in public expenditures should be accompanied by GDP growth; the socio-economic development of a country is determined not only by the volume but also by the efficiency of public financial resource utilization (in line with Keynes' hypothesis); the level of GDP redistribution through the state budget is sensitive to crises; local budgets are less affected by financial and economic crises; and in the face of external threats, especially when a country is involved in a military conflict, the role of the state increases. The study results provide several managerial recommendations aimed at improving the public investment system for local development.

Keywords: public spending, budget, sustainable economic growth, crisis, structure of expenditures, managerial recommendations

JEL Classification: E62, H50, H54, H63, E60, O44, Q01

INTRODUCTION

Public spending is an important instrument of the country's financial policy as it allows for the regulation of issues of territorial accumulation of financial resources, transformation of the structure of social production and employment, implementation of important reforms, etc. The economic justification of the mutual influence of economic development and public spending policy is based on the fact that, on the one hand, the rate of economic growth of the country influences the volume and structure of public spending. On the other hand, the efficiency of the use and allocation of public financial resources determines the level of socio-economic development of the country and the direction of economic transformation. The important tasks of the country's development include the improvement of planning and efficiency of public spending and the search for the optimal structure of spending that will allow for achieving the strategic goals of the state and region's development. International and domestic experience shows that such tasks are significantly more complicated in conditions of uncertainty and become more urgent in times of economic crises. The war in Ukraine has led to the destruction of a significant part of the country's economy and the loss of export capacity, resulting in a significant decrease in tax revenues and the dependence of the state budget of Ukraine on financial assistance from Western partners. Meanwhile, it has also necessitated a review of funding priorities, the structure of budget spending, and focus on permanent overcoming of the consequences of the war, and often led to the refusal to finance development projects. In this context, it is important to understand what happens to public spending in times of crisis, how the structure of spending changes, and what potential impact this will have on the country's economic growth.

LITERATURE REVIEW

The debate on the mutual influence of such basic concepts as public spending and economic growth can be considered a classic in the economic literature. Meanwhile, total general government spending includes the following items: intermediate consumption; compensation of employees, subsidies, social benefits, and social transfers in kind (via market producers); other current transfers; property income; capital transfers (payable); the adjustment for the net equity of households in pension funds reserves; gross capital formation; net acquisition of non-financial non-produced assets. It also includes taxes on income and wealth and other taxes on production that governments may be required to pay (Government expenditures, revenues and deficits, 2016). Economic growth is one of the key indicators of a country's development, which is primarily characterized by an increase in real GDP or national income over a certain period and GDP growth per capita.

There is a relationship between these concepts characterized by mutual influence, which is described by two hypotheses: Wagner's hypothesis (1883) (Magazzino et al., 2015) states that the rate of economic growth of a country is usually reflected in an increase in tax revenues and causes a subsequent increase in public spending; Keynes' hypothesis (1936) (The General Theory and Keynes for the 21st Century, 2018) proves that the efficiency of the use of public financial resources has a direct impact on the socioeconomic development of the country.

Meanwhile, Arauco et al., (2022); Romer, (1986); Barro, (1990) argue that the growth of public spending can have a different impact on economic growth – it all depends on its structure, i.e., which sectors of the economy it is directed to and where it is concentrated. According to Romer's theory of endogenous growth, public investments aimed at developing human capital and innovation have the highest effect. Economic growth is fueled by spending on transportation infrastructure, justice, and defence (Colombier, 2009). Spending on education (investment in human capital) and spending on research and development (innovation/technological progress) are the main factors of intensive economic development (Afonso, 2005). Aisa R. and Pueyo F., (2006) also find a positive impact of public spending on health care by increasing life expectancy.

Many researchers argue that excessive concentration of spending in the hands of the state becomes an obstacle to economic development, so economically developed countries have begun to reduce their share of government spending by "denationalizing" the social sphere. Thus, empirical studies by Fölster & Henrekson (2001) show that there is no correlation between the growth of public administration spending and economic growth for developed countries.

The results of the research of the economists Armeij D., (1995); Rahn R., Fox H. (1996); and Scully G.W. (1994) can be considered a development of Wagner's hypothesis on the direct relationship in the economy-state subsystem. They have substantiated the Armeij-Rahn effect, according to which the positive impact of increasing public spending on GDP is observed until the optimal value of the share of public payments is reached, and further growth will reduce production. Bose, Haque, and Osborn (2007) also prove the correlation between the level of development of a country and the efficiency of public spending. They conclude that the higher the country's GDP, the stronger the relationship between GDP growth and public spending aimed at economic growth.

There is a wide range of publications assessing the interdependence between public spending and economic growth in individual countries, which do not always show unambiguous results. Popescu C.; Diaconu L. (2021) assess the existence of a relationship between public spending and economic growth through Wagner's and Keynes' hypotheses on the example of Romania. The results of the study do not confirm the existence of a constant relationship in the long term, while there is a stable relationship in the short term. According to the authors, the effect of increasing public spending on the national income is short-term, and in the long-term inflation can be leveled by the positive interaction between them. In the case of Turkey, neither Wagner's nor Keynes' hypothesis works (Bagdigen and Cetintas, 2004).

Empirical studies reveal the existence of a direct two-way relationship between public spending and economic growth in Thailand (Jiranyakul, Brahasrene, 2007), India (Holmes, Hutton, 1990), Nigeria (Ighodaro, Oriakhi, 2010), and Italy (Magazzino, 2009). However, an in-depth study of the structure of public spending in Nigeria (Nurudeen, Usman, 2010) indicates that the growth of public spending on education shows a negative correlation with economic growth. Instead, the allocation of public resources to such areas as road and communications infrastructure and health care leads to accelerated economic growth.

Research by Lagoarde-Segot T. (2020), Stoeva L. (2023) confirms that in developed countries, in particular those that have made commitments to achieve the Sustainable Development Goals (SDGs), domestic public resources directly contribute to the achievement of the SDGs through the financing of public goods and services. They also help reduce inequality through GDP redistribution, change household and business behaviour through incentives, and smooth the macroeconomic cycle through countercyclical policy instruments.

For Ukraine, which is suffering from the full-scale armed aggression of the Russian Federation, the issue of the potential impact of the rapid increase in public defence spending on the prospects of the socio-economic development of the country is of great importance. The idea of exploiting variation in military spending has long-standing support in economic research (e.g., Barro (1981), Hall (1986), Rotemberg and Woodford (1992), Nakamura and Steinsson (2014), Ramey and Zubairy (2018), Miyamoto et al. (2019), Auerbach et al. (2023), Sheremirov and Spirovska (2022)). Much historical evidence indicates that the fiscal expansion driven by military spending is motivated primarily by geopolitical factors. The military support for Ukraine is a testament to this principle. Thus, by isolating the component of government spending that is independent of current and expected future economic conditions, it is possible to identify the output effects of government spending.

In general, the heterogeneous results only prove the complexity and multifactorial nature of economic growth, as well as the significant differentiation of fiscal stimulus mechanisms across countries.

AIMS AND OBJECTIVES

The study aims to analyze the impact of public spending on sustainable economic growth during economic crises in developed countries. It seeks to determine whether government expenditure supports economic recovery while ensuring long-term sustainability.

The main objectives of this study are:

1. Evaluate the role of public spending in stimulating economic growth during crises.
2. Assess the effectiveness of different types of public expenditure (e.g., infrastructure, healthcare, social welfare) in promoting sustainable development.
3. Use empirical testing to analyze data from developed economies and measure the impact of fiscal interventions.
4. Provide policy recommendations for governments to enhance crisis management and sustainable economic planning.

METHODS

There are several hypotheses in the economic literature about the relationship between public spending parameters and economic growth, which are tested for different countries and different time periods and show quite different results.

To determine the peculiarities of the behaviour of public spending in the current conditions of high financial and economic turbulence, the dynamics and structure of public spending in the group of developed countries (as a share of GDP redistributed through the state budget) were analyzed.

The following hypotheses were selected for testing:

- according to Wagner's law, an increase in public expenditures should be accompanied by GDP growth;
- the socio-economic development of a country is determined not only by the volume but also by the efficiency of public financial resource utilization (in line with Keynes' hypothesis);
- the level of GDP redistribution through the state budget is sensitive to crises;
- local budgets are less sensitive to financial and economic crises.

The period of 2005-2022 was chosen to test the hypotheses. It includes two crisis periods: the global financial crisis of 2008-2009 and the crisis caused by the spread of the COVID-19 pandemic in 2020-2021.

The study covers 33 countries, including the EU, the US, Canada, Ukraine, China, and Russia. The sample was formed to analyze such classical models of financial relations in society as the American one (with a low level of budgetary centralization of 20-30% of GDP, the maximum level of self-financing of legal entities and self-sufficiency of individuals, and limited level of state influence), the European one with a moderate level of budgetary centralization of 35-50%, and the Scandinavian one with a high level of budgetary centralization of 50-60% and characterized by an extensive state social sphere. Ukraine is seen as a country that has implemented a number of transformations in the public sector similar to those of European countries. China and Russia are chosen as countries with relatively low centralization of GDP in the state budget and with a high level of differentiation between the incomes of population groups, as well as gaps in the socio-economic development of territories.

RESULTS

The main regulatory role of public spending is to redistribute GDP between economic sectors, administrative units, and social groups. Such regulation provides incentives for priority sectors of the economy, strengthens external and internal security, and reduces the level of income differentiation and socio-economic development of the territories. The level of centralization of GDP in the budget, i.e., the share of GDP that is redistributed through the state budget, is the main indicator of the state's influence on socio-economic development.

The analysis of the dynamics and structure of public spending in the selected group of countries (as a share of GDP redistributed through the state budget in different countries) allows for verifying a number of hypotheses in the current conditions of high financial and economic turbulence.

According to Wagner's law, public spending growth should be accompanied by GDP growth.

The main criterion for identifying the relationship between changes in public spending and macroeconomic indicators is the rate of change of these parameters. Their analysis in the sample of countries for the period 2005-2022 (Figure 1) confirms the existence of a trend in the period under study – most countries demonstrated GDP growth per capita simultaneously with the growth of the share of GDP that is redistributed through the state budget (21 out of 32 countries fell into the second quadrant). At the same time, GDP growth significantly outpaced the growth of public spending.

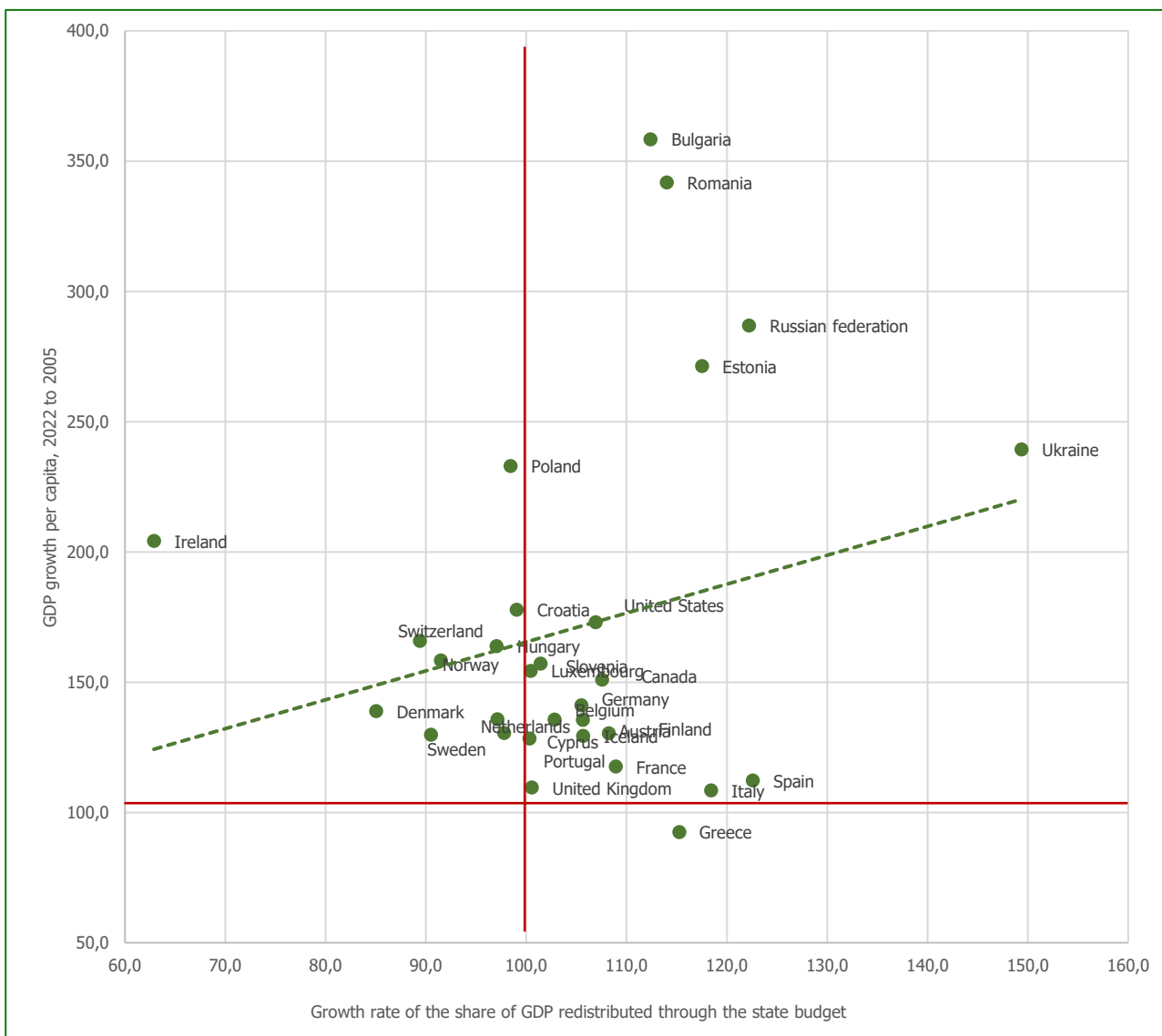


Figure 1. Comparison of growth rates of the share of GDP redistributed through the state budget and GDP growth rates, 2022 to 2005, %. (Source: compiled by the authors based on data from IMF)

Interestingly, in the 10 studied EU countries, the level of centralization of GDP in the state budget decreased. The first quadrant includes Denmark, Sweden, Hungary, Portugal, Croatia, the Netherlands, Poland, Norway, Switzerland, and Ireland.

The analysis of the dynamics of the share of GDP redistributed through the state budget in 2005-2022 suggests that this period saw a “blurring” of classical models of financial relations in society. We are talking about such traditional models as the American model (with a low level of budgetary centralization of 20-30% of GDP, maximum level of self-financing of legal entities and self-sufficiency of individuals, and limited level of state influence), the European model with a moderate level of budgetary centralization of 35-50%, and the Scandinavian model with a high level of budgetary centralization of 50-60% and characterized by an extensive state social sphere.

First, there is a gradual decline in the level of centralization of GDP in the state budget in most Scandinavian countries (Figure 2).

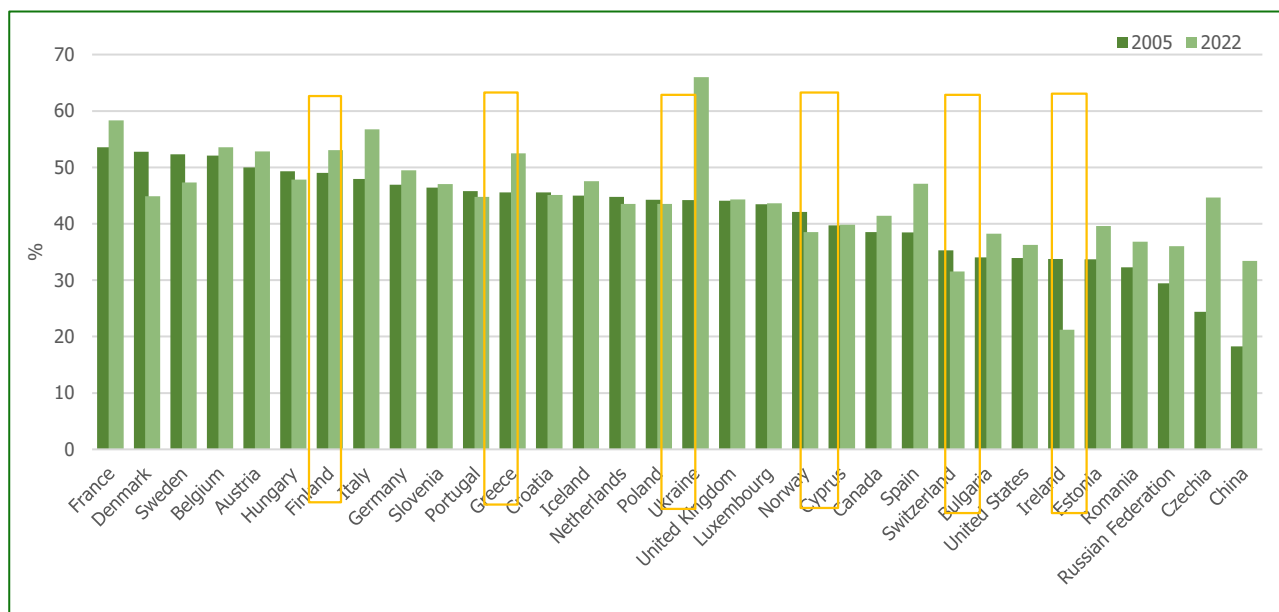


Figure 2. Dynamics of the level of GDP centralization in the state budget, 2005, 2022, %. (Source: compiled by the authors based on data from IMF)

Second, Canada and the United States of America have demonstrated a gradual increase in the level of GDP redistribution through the state budget in recent decades.

Third, China and the Russian Federation, which have always been characterized by a very high level of differentiation between the incomes of the richest and poorest groups of the population, as well as gaps in the socio-economic development of their territories, have directed their policies towards increasing the share of redistribution of national wealth.

Fourth, Ukraine is characterized by a fairly high level of centralization of GDP in the state budget (44-48% by 2021), and its rapid growth in 2022 is driven exclusively by the military conditions of generation and use of budgetary resources rather than by evolutionary trends or financial sector reforms. In the first year of the war, the ratio of the state budget to Ukraine's GDP increased by 1.73 times due not only to a 30% reduction in the country's GDP because of the war but also to the rapid growth of defence spending.

The level of GDP redistribution through the state budget is sensitive to crises.

The level of centralization of GDP in the state budget of the studied countries demonstrates sensitivity to crises due to the growth of cyclical costs in times of crisis – the global financial and economic crisis of 2009-2010 and the economic crisis caused by the spread of the COVID-19 pandemic in 2020-2021 (Table 1).

Table 1. Dynamics of the share of GDP distributed through the state budget, 2005, 2009, 2020, 2022, %. (Source: compiled by the authors based on data from IMF)

	2005	2009	2020	2022
France	53.57	56.74	61.35	58.34
Denmark	52.79	58.42	53.48	44.89
Sweden	52.30	52.4	51.02	47.32
Belgium	52.08	53.83	58.92	53.55
Austria	49.99	52.89	56.50	52.80
Hungary	49.32	50.56	51.08	47.85
Finland	49.02	54.09	57.19	53.05
Italy	47.92	51.61	56.99	56.74
Germany	46.91	48.10	50.46	49.48
Slovenia	46.39	49.35	51.35	47.04
Portugal	45.77	49.89	49.23	44.76
Greece	45.56	54.08	60.05	52.50
Croatia	45.56	50.11	54.11	45.12
Iceland	45.00	53.58	51.25	47.54
Netherlands	44.79	51.55	47.83	43.50
Poland	44.24	45.01	48.25	43.54
Ukraine	44.19	48.62	45.60	66,00
United Kingdom	44.06	51.46	49.87	44.30
Luxembourg	43.45	42.70	46.96	43.63
Norway	42.11	46.32	56.73	38.52
Cyprus	39.69	41.89	44.61	39.81
Canada	38.52	43.42	52.70	41.43
Spain	38.44	46.26	51.90	47.11
Switzerland	35.27	34.15	37.10	31.53
Bulgaria	34.03	33.77	37.79	38.24
United States	33.92	41.39	44.82	36.26
Ireland	33.76	48.90	27.17	21.23
Estonia	33.72	45.85	44.93	39.62
Romania	32.30	36.31	38.18	36.82
Russian Federation	29.46	38.06	39.15	36.00
Czechia	24.37	44.36	47.22	44.65
China	18.27	25.65	35.60	33.40

Table 1 clearly demonstrates the increase in the centralization of GDP in the state budget in 2009 and 2020. Meanwhile, the growth of the share of GDP redistributed through the state budget in 2020 was more significant. In general, in the EU countries, it amounted to +6.3% compared to the previous crisis year of 2009.

Ukraine's state financial policy in 2020 followed global trends: the healthcare crisis during the COVID-19 pandemic prompted the allocation of additional budgetary resources for medical purposes, which led to an increase in the share of public spending in Ukraine's GDP by 3.5%.

Local budgets are less sensitive to financial and economic crises.

Speaking of public spending, it should be understood that it occurs at different levels of the country's budgetary system. An assessment of the behaviour of local budgets in times of crisis leads to the conclusion that despite the growth of the share of GDP concentrated in the state budget in general during the years of growing instability, the share of financial resources redistributed through local budgets remains practically at the same level (Table 2). This shows that the main burden of overcoming the crisis lies with the central authorities in the context of strengthening their functions.

Table 2. The ratio of consolidated budget and local budget expenditures to GDP in the EU and Ukraine, 2007-2022, %. (Source: compiled by the authors based on data from Eurostat)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Consolidated budget in the EU countries	45.6	46.7	50.7	50.5	49.2	49.8	49.6	49	48.1	47.4	46.7	46.5	46.5	52.8	51.1	49.6
Local budgets in the EU countries	10.8	11.1	11.9	11.7	11.4	11.4	11.4	11.3	11.1	10.9	10.8	10.8	10.9	11.6	11.2	10.9
Consolidated budget of Ukraine	30.1	31.2	32.5	33.7	30.9	33.8	33.2	33.4	34.2	35.0	35.5	35.1	34.5	37.8	33.8	58,6
Local budgets of Ukraine	14.0	14.0	14.4	14.3	13.4	15.3	14.4	14.4	14.1	14.7	16.6	16.0	14.2	11.3	10.4	9.3

The share of local budgets of Ukraine in GDP in 2016-2018 increased due to the active implementation of administrative and financial decentralization accompanied by the process of redistribution of administrative powers between local governments and executive authorities to provide public services on the principle of subsidiarity, as well as the creation of institutionally and financially capable territorial communities. The decrease in the share of local budgets in Ukraine's GDP since 2019 is also explained by the continuation of reforms in the public sector, including the transfer of healthcare responsibilities from the local to the central level, etc.

The socio-economic development of a country is determined not only by the volume but also by the efficiency of the use of public financial resources (according to the Keynesian hypothesis). In other words, an increase in consumption spending may not result in an increase in GDP. There are many examples in history when the concentration of public spending on supporting the development of highly productive sectors of the economy, innovations, technologies, and research projects led to an increase in labour productivity and, consequently, to rapid GDP growth. Meanwhile, the responsibility of the state for performing social functions and the social orientation of developed countries lead to a gradual increase in social spending alongside economic spending, with the share of social spending remaining higher.

Examining the trends in public spending during crises, we conclude that the different nature of the crisis leads to different behaviours of the state in supporting certain sectors. The dynamics of public social spending in the examined countries (Figure 3) shows an increase in the share of this spending during the crisis periods – by 1.8 percentage points in 2009 and by 2.9 percentage points in 2020. At the same time, 2.5 out of 2.9 percentage points were caused by an increase in public social spending, while 0.5 percentage points were related to a decline in GDP.

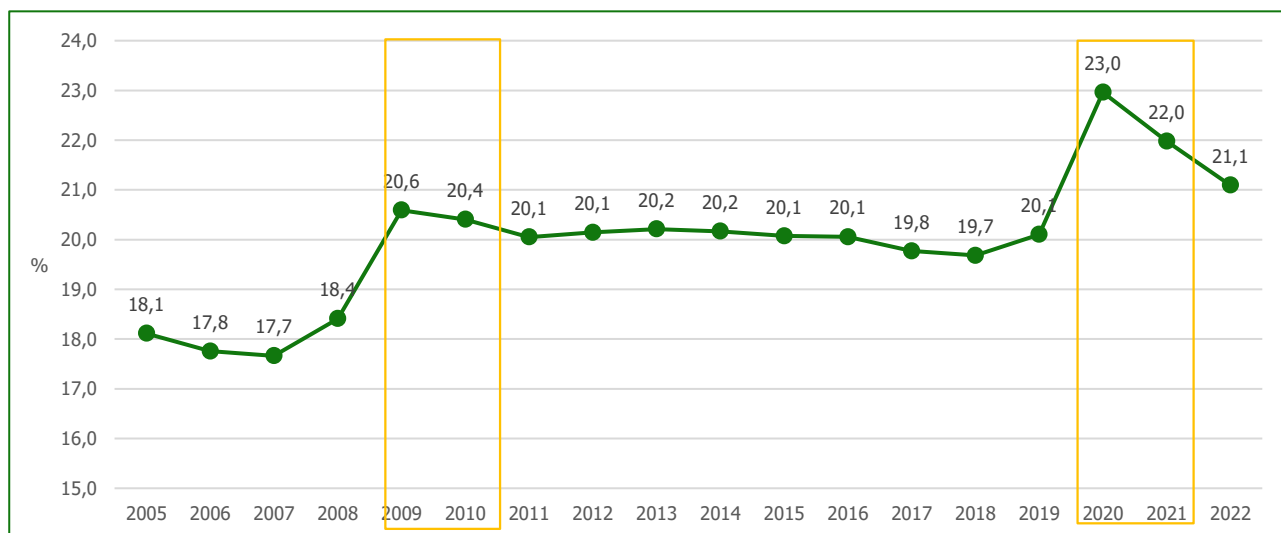


Figure 3. Public social spending as a % GDP, 2005-2022. (Source: compiled by the authors based on data from Social Expenditure Database)

Following an initial surge at the onset of the pandemic, the ratio of social spending to GDP declined almost as rapidly as it had risen—dropping from an average of 23% in 2020 to 21.1% in 2022. This trend stands in stark contrast to the aftermath of the 2008–2009 global financial crisis. During that period, public social spending as a share of GDP increased from an average of 17.7% in 2007 to 20.6% in 2009. However, in the subsequent years, this ratio only slightly decreased to 20.1% by 2011 and remained at that level until the outbreak of the COVID-19 pandemic. These differing patterns are largely

attributed to the significantly faster economic recovery from the COVID-19 pandemic compared to the global financial crisis.

The surge in public social spending in 2020 was primarily driven by increased government expenditures on healthcare, unemployment benefits, active labour market programs, and direct cash transfers aimed at offsetting income losses caused by the pandemic.

Crises always lead to an increase in the number of people who lose their jobs and/or need financial and social support. The growth of social spending in countries that have committed to achieving the SDGs is also aimed at achieving the goals of reducing poverty, reducing inequality between people and social groups, and ensuring sustainable economic growth.

It is also important to identify how the structure of spending from national and local budgets is changing. The analysis (Table 3) allows us to confirm the existence of the following trends:

1. Over the past decade, there has been a steady downward trend in the share of spending on general government functions – by 6.1 percentage points.
2. The share of central budget spending on economic activity increased from 11.9% to 16.8% in 2001 (or from 4.6% to 6.3% of GDP). EU countries invest in economic development and support through business incentive programs, innovations, infrastructure projects (roads, railways, airports), and agricultural development. Meanwhile, it is important that the share of spending from local budgets remains more or less constant, i.e., the role of the national level in stimulating economic development is increasing in developed countries.
3. Throughout the period, the share of public spending on healthcare has been gradually increasing, both from the central budget and local budgets. This trend has intensified with the spread of the COVID-19 pandemic.

Table 3. Dynamics of the structure of public spending from national and local budgets of the EU countries, 2013-2021, %. (Source: compiled by the authors based on data from Eurostat)

Functions	Budget level	2013	2014	2015	2016	2017	2018	2019	2020	2021
General public services	Central	35.7	34.8	34.0	32.9	32.1	32.9	31.3	29.9	29.6
	Local	15.9	16.0	15.8	15.9	15.9	15.7	15.6	14.9	15.0
Defence	Central	5.0	4.8	5.0	5.3	5.3	5.4	5.4	5.0	4.8
	Local	0	0	0	0	0	0	0	0	0
Public order and safety	Central	4.5	4.6	4.6	4.7	4.7	4.8	4.9	4.4	4.3
	Local	2.6	2.5	2.5	2.6	2.6	2.6	2.6	2.6	2.6
Economic affairs	Central	11.9	11.8	11.5	11.6	12.6	12.4	12.5	15.5	16.8
	Local	13.4	13.3	13.2	12.5	12.6	13.0	13.2	13.6	13.5
Environmental protection	Central	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.7	0.7
	Local	5.4	5.4	5.4	5.1	5.0	5.2	5.2	5.2	5.2
Housing and community amenities	Central	0.7	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.8
	Local	4.3	4.2	4.1	3.8	3.9	3.9	4.0	3.8	3.9
Health	Central	5.6	6.0	5.8	6.4	6.5	6.7	6.6	7.3	8.0
	Local	15.8	15.8	15.8	15.8	15.7	15.6	15.4	16.1	16.5
Recreation, culture and religion	Central	1.4	1.4	1.4	1.6	1.6	1.7	1.7	1.5	1.5
	Local	6.0	5.9	5.8	5.7	5.8	5.9	6.0	5.6	5.6
Education	Central	9.8	10.1	10.2	9.9	10.0	10.3	10.3	9.2	9.0
	Local	15.4	15.5	15.3	15.4	15.5	15.4	15.5	15.4	15.5
Social protection	Central	24.6	25.1	25.2	26.3	25.9	25.2	25.8	25.7	24.5
	Local	21.1	21.3	22.0	23.2	23.1	22.7	22.5	22.7	22.3

Social spending also prevails in the structure of public spending through the state and local budgets of Ukraine – 59.0% and 25.1%, respectively. The structure of the state budget changed dramatically due to the war. Thus, the share of defence in the structure of the state budget increased from 8.56% in 2021 to 42.24% in 2022, or 6 times (Table 4). At

the same time, however, it should be noted that after Russia's annexation of Crimea and the war in Donbas, the share of defence spending in the state budget increased by only 2.2 percentage points from 2014 to 2021.

Table 4. Dynamics of the structure of state and local budget spending in Ukraine, 2013-2022. (Source: compiled by the authors based on data from the Ministry of Finance of Ukraine)

Functions	Budget level	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
General public services	State	4.56	15.3	17.87	17.22	16.97	16.53	15.68	12.72	13.87	7.47
	Local	3.9	3.6	5.2	4.6	4.8	5	6.2	8.6	8.1	9.9
Defence	State	3.67	6.36	9.01	8.67	8.86	9.84	9.94	9.35	8.56	42.24
	Local	0	0	0	0	0	0	0	0	0	0
Public order and safety	State	9.71	10.37	9.47	10.47	10.47	11.86	13.06	12.24	11.7	16.39
	Local	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.3	2.3
Economic affairs	State	10.24	8.0	6.44	4.59	5.60	6.45	6.74	13.11	12.14	3.53
	Local	5.2	4.9	6.8	9.9	11.3	13.5	14.5	19.6	19.7	12.6
Environmental protection	State	1.14	0.6	0.7	0.7	0.56	0.53	0.59	0.52	0.55	0.17
	Local	0.04	0.03	0.5	0.4	0.5	0.5	0.6	0.5	0.4	0.1
Housing and community amenities	State	0.02	0.03	0	0	0	0.03	0.01	0.01	0.01	0.02
	Local	3.5	7.9	5.6	5	5.5	5.3	6.1	6.7	10	8.3
Health	State	3.2	2.46	1.98	1.82	1.99	2.29	3.59	9.7	11.44	6.81
	Local	22.1	20.6	21.3	18	17.3	16.3	15.9	10.6	5.8	4.6
Recreation, culture and religion	State	1.26	1.13	1.15	0.72	0.94	1.03	0.93	0.76	1.07	0.41
	Local	5	5	3.4	3.4	3.3	3.3	3.8	4.6	4.6	4.6
Education	State	7.66	6.67	5.23	5.09	4.90	4.50	4.81	4.1	4.28	2.16
	Local	32.7	30.5	30	27	27.5	29	33	41.7	43.7	47.9
Social protection	State	21.93	18.72	17.98	22.19	17.22	16.62	20.38	25.05	22.77	15.75
	Local	24.9	24.7	25.9	30.3	28.5	25.5	18.2	5	4.9	6

Also, the structure of state and local budget spending in Ukraine has been changing under the influence of administrative and financial decentralization in the country and the transfer of powers between different branches of government. As a result, the share of spending on healthcare and social protection increased in the state budget, and the share of spending on education increased in local budgets.

A comparison of the dynamics of changes in the structure of public spending in the EU and Ukraine reveals the following differences (Figure 4):

1. The reform of the budget system in Ukraine, which took place in the context of de-centralization, has brought Ukraine closer to European countries in terms of the distribution of social spending between budget levels – as of 2021, the share of social spending was 39.6% in the central budget (compared to 41.4% - 44.45% in EU countries) and 59% in local budgets (compared to 58.3%-60.1% in EU countries).
2. The share of central government budget spending on economic activity is stable in the EU's spending structure. The almost 4-fold increase in local budget spending on economic activities between 2013 and 2021 is a positive trend in Ukraine. This indicates a growing role of local governments in regulating the development of their territories and expanding the tax base of local budgets.
3. The increase in the share of spending on economic activity in Ukraine was primarily caused by the "road construction boom". Funding for the State Road Agency of Ukraine increased from UAH 26.5 billion in 2018 to UAH 91.7 billion in 2020 (Bohdan, 2021).

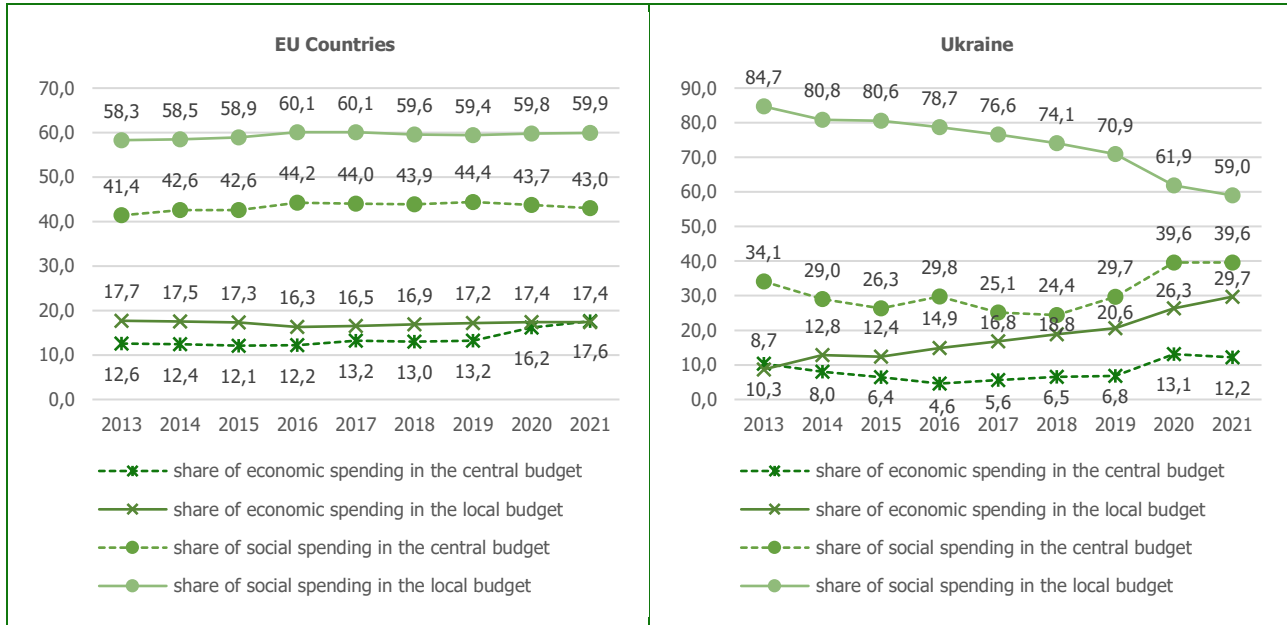


Figure 4. Comparison of the dynamics of changes in the structure of the budgets of the EU countries and Ukraine, 2013-2022, %.
 (Source: compiled by the authors based on data from Eurostat)

In general, most EU countries during the crises adhered to spending policies aimed at austerity and budget discipline, which contributed to reducing budget deficits and not increasing debt obligations of local economies.

As the war in Ukraine progressed, enhancing military capabilities became a top priority for many nations, both to strengthen their own defence and to provide support to Ukraine. Although the proportion of public spending allocated from state budgets remained largely unchanged, military expenditures in European countries surged at an unprecedented rate in 2022, reaching levels not seen since the Cold War following Russia's invasion of Ukraine.

This increase in military spending across Europe contributed to global defence expenditures hitting a record high for the eighth consecutive year, totalling USD 2.24 trillion – equivalent to 2.2% of the world's GDP, according to the Stockholm International Peace Research Institute (SIPRI) (Defense spending in the world has increased, 2023). This marked the largest annual rise in over three decades, bringing global military spending (adjusted for inflation) back to 1989 levels when the Berlin Wall fell. Ukraine, in particular, increased its military budget sevenfold to USD 44 billion, amounting to nearly one-third of its GDP. Additionally, the country has received billions of dollars in military aid from international allies. Will this significant rise in military spending affect GDP growth?

The Economist has analyzed World Bank data for 1960-2021 to examine the relationship between military spending and GDP growth. The researchers did not find an inverse correlation between these two phenomena but instead found that increased investment in defence research contributes to increased public spending on innovation in other areas, such as aerospace, information technology, and others.

DISCUSSION

The results obtained fully confirm the authors' hypotheses. In general, public spending ensures an increase in aggregate demand and stimulates economic growth. However, different types of spending have an unequal impact on economic growth. Capital spending for investment purposes, which increases the tax base and hence financial capacity, as well as investments in human capital, have the most positive impact. Therefore, it is particularly important to assess the structure of government spending.

The volume and structure of government budget spending are determined by the peculiarities of the implemented socio-economic model. Choosing the optimal level and structure of public spending is a key task of fiscal policy aimed at ensuring economic growth in the country. Meanwhile, for the modern welfare economy, the unambiguous mission of the state is to ensure public welfare, and state intervention in economic processes should take into account the balance of interests and needs of different social groups.

Meanwhile, when it comes to ensuring sustainable growth and supporting social well-being, it is extremely difficult to separate the impact of public spending aimed at different goals. For instance:

1. Developed countries invest heavily in the development and maintenance of transport infrastructure, including roads, railways, ports, airports, and other modes of transportation. This contributes to increased competitiveness and better connections between the territories.
2. Public spending on the education and science system and funding for higher education institutions, research programs, and innovative projects helps to ensure a high level of workforce qualification and stimulates innovative development.
3. Spending on social programs that provide access to healthcare, pensions, family support, and other types of assistance for citizens helps reduce inequality and improve the quality of life, thereby increasing consumption and stimulating the economy.
4. The concentration of public spending on reducing green transformation, using renewable energy sources, and preserving natural resources aims to create environmentally friendly technologies and green jobs.
5. Countries are also actively investing in the growth of less developed regions, contributing to their economic growth and reducing the differentiation in the level of development between different territories. This contributes to the development of the country's domestic market and more efficient use of the socio-economic capacity of the territories and their integration into the internal economic space.

Examining the trends in public spending during crises, we conclude that the different nature of the crisis leads to different behaviours of the state in supporting certain sectors.

But developed countries, even in the face of crises, direct their expenditures to achieve the SDGs, in particular, goal 1 "No poverty", goal 8 "Decent work and economic growth", goal "Reduced inequalities", and goal 12 "Responsible consumption and production".

Speaking of Ukraine, one should note the high level of decentralization against the background of the low level of GDP per capita. The situation became more complicated in the conditions of a full-scale war with Russia, which provoked a sharp loss of Ukraine's economic potential, and its export opportunities, which affected a significant drop in GDP.

The war in Ukraine requires a special approach and the development of an adaptation scenario for planning and balancing the structure of state budget spending due to the significant gap between budget spending and revenues. In particular, a budget deficit of UAH 1.5 trillion is expected in 2024 (UAH 1.8 trillion in revenues that the Ukrainian economy can provide and the need for UAH 3.3 trillion in spending) (Defense spending in the world has increased, 2023). The solution to the problem in the past war years was to cover this gap by expanding the sources of budget financing, namely the use of state loans, financial assistance, and grants from the United States, the United Kingdom, international financial institutions, and EU countries.

Under such conditions, budget constraints and financial discipline can increase the adaptive capacity of the budget, in particular: identification of priority expenditures (military needs, restoration of territories, burden on the healthcare sector, etc.), adoption and observance of budget rules – quantitative restrictions on budget parameters, and reduction (sequestration) of public spending. This requires further research.

At the same time, world experience allows us to single out several managerial recommendations that will improve the system of public investment for local development. In developed countries, the system of public investment is built on the principles of multi-level governance. Besides the territorial-administrative structure of the country and its multi-level governance mechanisms play an important role in achieving inclusive and sustainable development. As sub-national governments control an ever-increasing share of total public resources, their competence in the development of public policy and the provision of public services is critical to the achievement of the Sustainable Development Goals. In order for Ukraine to implement the principles of multilevel governance, an important issue is the growth of the role of all interested parties in the effective functioning of the public sector and control over public expenditures at all levels of the public sector. Real implementation of multi-level and multi-sectoral management mechanisms is also important, as well as understanding patterns of influence on demographic, social and economic effects.

CONCLUSIONS

The study of the relationship between public spending and sustainable economic growth reveals a complex and multifaceted relationship that varies by context, economic conditions, and political factors. The empirical testing of hypotheses about such relationships, as well as the behaviour of public spending in crisis conditions, has led to a number of conclusions.

There is a close relationship between budget spending and the functions of the state since the functions determine the direction of spending, and the number of expenditures impacts the full implementation of state authorities' powers. In the scientific literature, the issue of the impact of public spending on the economic growth of territories is relevant and controversial. Positions of scientific schools on the impact of public spending on economic growth differ. Various empirical studies show that public spending increases aggregate demand and boosts economic growth. However, different types of spending (current or investment) and their different focus in the sectoral breakdown have unequal impacts on economic growth.

Although investment-oriented spending is recognized as more effective in fostering economic growth, the budget policies of developed countries primarily focus on maintaining social standards and striving to balance economic development with social equity. This is evident in the gradual rise in the share of GDP redistributed through the state budget and the dominance of social expenditures.

The centralization of GDP within national budgets is highly responsive to economic crises, leading to increased spending during crisis periods such as 2009–2010 and 2020–2021. Economic downturns also influence the structure of budget expenditures, as demonstrated by the rising share of healthcare spending during the COVID-19 pandemic and defence spending amid the war with Russia. However, local budgets tend to be less affected by crisis dynamics in terms of both spending levels and structural changes.

Crisis phenomena can significantly change the structure of the state budget. They may be related to the cyclical nature of economic development and the course of the economy through certain phases of the economic cycle. In the face of external threats, especially if the country is drawn into a military conflict, the role of the state is growing as evidenced by the dramatic changes in the structure of the state budget of Ukraine during the war, as well as the growth of military spending in the EU, the US, and other countries. In such circumstances, the government and the state budget are entrusted with the primary task of developing an adaptation scenario and ensuring the priorities of budget financing of the country's defence and security, reviewing other types of spending with the purpose of optimization.

Future research should explore in greater detail the impact of different types of public expenditures (social, investment, defence) on economic growth during prolonged crises, particularly in the context of war or global pandemics. Another promising direction is the analysis of the efficiency of budget fund utilization at the regional level, taking into account local conditions and priorities. It is also important to investigate mechanisms for adapting fiscal policy to new challenges, such as climate change, migration crises, or technological transformations. Additionally, developing a methodology to assess the relationship between public spending and the achievement of Sustainable Development Goals (SDGs) in the long term would be valuable.

ADDITIONAL INFORMATION

AUTHOR CONTRIBUTIONS

All authors have contributed equally.

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CONFLICT OF INTEREST

The Authors declare that there is no conflict of interest.

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ДЕРЖАВНІ ВИДАТКИ ТА СТАЛІЙ ЕКОНОМІЧНИЙ РОЗВИТОК В УМОВАХ КРИЗИ: ЕМПІРИЧНЕ ТЕСТУВАННЯ НА ПРИКЛАДІ РОЗВИНЕНИХ КРАЇН

Удосконалення планування та підвищення ефективності державних видатків, а також визначення їхньої оптимальної структури є ключовими завданнями для розвитку країни. Однак ці завдання значно ускладнюються в умовах невизначеності й особливо актуальні під час економічних криз. У цьому дослідженні розглянуті характеристики й тенденції впливу державних видатків на економічне зростання в кризові періоди в розвинених країнах. Застосовано системний методологічний підхід у поєднанні зі статистичними методами дослідження. Підтверджено кілька авторських гіпотез: згідно із законом Вагнера, збільшення державних видатків має супроводжуватися зростанням ВВП; соціально-економічний розвиток країни визначається не тільки обсягом, а й ефективністю використання державних фінансових ресурсів (відповідно до гіпотези Кейнса); рівень перерозподілу ВВП через державний бюджет чутливий до кризових явищ; місцеві бюджети менше потерпають від фінансово-економічних криз; а в умовах зовнішніх загроз, особливо коли країна втягнута у воєнний конфлікт, роль держави зростає. За результатами дослідження надано низку управлінських рекомендацій, спрямованих на вдосконалення системи державного інвестування для міцного розвитку.

Ключові слова: державні видатки, бюджет, стале економічне зростання, криза, структура видатків, управлінські рекомендації

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