

10.2478/nispa-2024-0003



Vulnerability and Resilience of Slovak Municipalities in the Era of Austerity

Lenka Malicka¹, Jana Vancová², Daniela Hadačová³

Abstract:

The consequences of periods of austerity, generally connected with economic crises, are not only reflected in the financial performance of local governments but also in the range in which they can face shocks. Monitoring the vulnerability and resilience associated with these shocks and the subsequent impacts on the financial situation of Slovak municipalities points to financial resilience, the ability to be proactive or, on the contrary, to be passive as a reaction to evolving environmental conditions. The paper examines the ability of 2,923 Slovak municipalities in the period 2005 - 2022, according to their size categories, to respond to periods of austerity in the economic reality of the Slovak Republic: The Global Financial Crisis from 2009 and the recent ongoing economic crisis arising from the crisis COVID-19, the subsequent military crisis in Ukraine, and the related energy crisis (multi-crisis). The resilience and vulnerability of Slovak municipalities, considering the size categories, are measured by employing a primary dispersion measure as the standard deviation of six financial indicators mirroring the local government's performance in the form of indexes linked to 2005. The results confirm the vulnerability of Slovak local governments in considered eras of austerity with relevant recovery periods, demonstrating a considerable degree of resilience. Besides, we reveal other structural breaks in the monitored period, which influenced the economic circumstances of Slovak municipalities, too.

1 Department of Finance, Faculty of Economics, Technical University of Košice, Kosice, Slovak Republic.

2 Department of Finance, Faculty of Economics, Technical University of Košice, Kosice, Slovak Republic.

3 Department of Finance, Faculty of Economics, Technical University of Košice, Kosice, Slovak Republic.

Keywords:

austerity, local financial management, municipality, resilience, vulnerability

JEL Classification:

G01, H70

1. Introduction

The closest self-governmental unit of the population in each country is the municipality. Municipalities provide a significant part of public services and goods in hard and soft infrastructure areas. The important position of municipalities in the public sector also brings a negative effect, directly reacting to any adverse impacts and eras of austerity. According to many authors, eras of austerity can be understood as periods of cutting in public finances, services, and goods because of events that have a significant impact on them, such as global financial crises (Whitfield, 2012; Schäfer & Streeck, 2013; Gurnani, 2016). The scientific sphere began to deal with the effect of crises during eras of austerity on the management of local governments in connection with their financial resilience and vulnerability after the economic crisis in 2009 (Peters, 2011). According to Barbera et al. (2017) and Barbera et al. (2020), the connection between vulnerability, resilience, and financial performance during crises reduces the ability to cope with emerging shocks. Arunachalam et al. (2023) state that municipal councils are vulnerable to crises due to insufficient structural reforms.

Local democracy in the Slovak Republic has faced several challenges since the regime change in 1989. Further reorganization and modernization of the public sector came hand in hand with fiscal decentralization, which took place in 2005. Concomitant 'good times' characterized by economic expansion before 2009 reinforced the impression of higher local financial autonomy attributed to fiscal decentralization. However, the structural breaks of ongoing turbulent decades have broken those illusions of policymakers, local leaders, and citizens because many Slovak municipalities proved to be vulnerable to current events, while their resilience aimed to be supported by structural reforms realized up to 2005.

This research examines the financial vulnerability and resilience of Slovak local governments by evaluating and comparing vulnerability and resilience through six indicators of local financial performance. The analysis is conducted on almost a whole sample of 2,923 Slovak municipalities from 2005 to 2022, while local governments are classified into size categories. We compute a dispersion of financial indicators for each size category, and further, we employ the indexation method to catch the important changes in the local financial performance during the monitored period compared to 2005.

This research expands the literature on local governments' financial vulnerability and resilience. It provides valuable information for local government leadership and the

scientific sphere by offering findings on whether and how local government's size affects its financial performance during and immediately following periods of austerity. Moreover, in the conditions of the Slovak Republic, a young and still developing democracy, we did not find a study that would evaluate the impact of the eras of austerity (The Global Financial Crisis from 2009 and the recent ongoing economic crisis arising from the crisis COVID-19) on the vulnerability and resilience of Slovak local governments using a set of financial indicators. This paper aims to fill a gap in this field, which can be observed not only in the conditions of the Slovak Republic.

2. Theoretical backgrounds – The concept of economic resilience and vulnerability in the condition of municipalities

In their research, Barbera et al. (2017) explain the connection between vulnerability and resilience. They state that to understand vulnerability, one must understand the patterns of financial resilience.

The term economic resilience has evolved from two dimensions of understanding. Resilience is understood from the engineering perspective (Holling, 1973; Pickett et al., 2004; Bhamra et al., 2011; Duit, 2016) and the evolutionary perspective (Hamel & Välikangas, 2003; Davoudi et al., 2012). The engineering perspective on resilience is defined as the ability to return to the original state, and the evolutionary perspective on resilience is the ability to react to adverse conditions. The ability to react to adverse conditions is characterized in economies as responding to shocks (Hood, 1991) and subsequently adapting to new conditions (Hamel & Välikangas, 2003). Resilience can be understood as the perception and assessment of risks arising from changed conditions (Linnenluecke & Griffiths, 2013); how these risks are managed from the point of view of coping with the impact of change, or the ability to transform, necessary after the impact of change (Darnhofer, 2014). According to many authors, economic vulnerability is also defined as the consequences that arise when the economy is exposed to exogenous shocks (crises) connected with economic openness. In connection with this, economic resilience is also examined as the economy's politically and otherwise induced ability to withstand the effects of such shocks or recover from them (Briguglio et al., 2009; Steccolini et al., 2017). Zafra-Gómez et al. (2009) claim that the concept of vulnerability was defined in connection with the examination of the financial sustainability of the municipality by the Canadian Institute of Chartered Accountants in 2009. The authors mention that investigating vulnerability is essential, especially in connection with the ability to fulfill existing financial obligations, including public services of municipalities. However, the incomes of many municipalities worldwide and in one country are not always sure. Many municipalities rely on transfers from a higher level of government (Lobo & Ramos, 2011; Sedmihradská, 2018; Wright & Slukhai,

2021), resulting in higher financial risk. According to the OECD (2022), municipalities are at risk due to their lack of income autonomy because, during crises, they are also influenced by the reactions of higher government levels themselves. Steccolini et al. (2017), however, draw attention to the differences that must be considered when assessing the impact of crises in connection with resilience on the economy of municipalities, which include the number and size of municipalities or the nature of the organization of the state and whether the state is unitary or federal.

A somewhat different understanding of resilience and associated vulnerability is also the ability of local governments, regions, and economies to return to a state of recovery post-crisis (Martin, 2012). Some researchers claim that financial resilience can be examined through taxes, financial reserves, and other income, such as tax income. These determinants are considered determinants of financial resilience. Lee and Chen (2021) also characterized these determinants collectively as total financial, human, and political resources. At the same time, the authors confirmed that the way the government deals with crises and the level of financial resilience varies depending on the source type. Klimanov et al. (2020) argue that fiscal resilience at the regional level is a capability of the regional budget system to recover from various shocks caused during eras of austerity. In the case of Russian regions, they found that in 2020, fiscal resilience was primarily supported by income from higher government levels, specifically from federal grants.

The consequences of the financial crisis of 2009 and the recent health crisis of COVID-19, which resulted in the ongoing financial crisis, persist even several years after their onset. All levels of government have significant problems with the ability to absorb and manage the negative impacts of crises. However, local governments need more abilities to adapt to these impacts due to limited financial resources and other restrictions. In general, in addition to the immediate effects of financial and other crises, economies are also affected by crises that occur with an unavoidable time delay. The era of austerity in Denmark's economy was, according to Mailand (2014), connected with entering the financial crisis in 2009, the same as in Greek municipalities, which demonstrated vulnerability to shocks and further deepening of financial crises (Cohen & Hlepas, 2017).

The second global severe era of austerity is also considered to be the economic crisis stemming from the adverse circumstances of the COVID-19 crisis. According to Hochrainer et al. (2023), a difference can be observed between the 2009 crisis and the crisis resulting from the COVID-19 pandemic. The 2009 crisis had a slow onset, while the 2020 crisis had a sudden onset. Ahrens and Ferry (2020) confirmed the statement of the OECD (2022). They mentioned a more complex situation for municipalities to manage, namely the COVID-19 and related financial crises. According to the authors, municipalities were more vulnerable in the 2020 economic crisis due to already existing and implemented austerity measures that could weaken the ability of local governments to face the 2020 crisis. However, due to the short time since the recent COVID-19 crisis, it is essential to mention that due to the delay in the manifestations of the measures

taken in the COVID-19 crisis, it is very likely still too early to talk about the consequences themselves and the degree of financial vulnerability and resilience in connection to this crisis. Padovani et al. (2021) proved that Portuguese municipalities are financially vulnerable to global pandemic crises in Portugal and Italy. Bloom et al. (2018) confirmed that fact, too. They claim that extensive infectious pandemic diseases and their related economic consequences cause economic crises that affect the economy of the regions. Even in the conditions of the Slovak Republic, government regulations during the pandemic, confirmed by the fear of Slovak residents for their health, led to the temporary closure of public institutions such as schools, transport services, and public services. However, these actions have significant economic and social impacts on public finances, e.g., lower incomes.

This paper aims to examine the financial vulnerability and resilience of 2,923 Slovak local governments sorted into size categories according to their numbers of inhabitants in the period 2005 – 2022. The contribution focuses on the possible identification of differences and dynamics of financial performance of almost all Slovak local governments in the era of austerity defined by recently observed external shocks (the Global Financial Crisis in 2009 and the crisis that arose in connection with the COVID-19 pandemic after 2020). The contribution analyses the dispersion of financial indicators connected with the paper's main aim. It tries to identify in which size category there is the highest volatility related to vulnerability during the crisis period and which size category adapts the fastest to the crises and the demanding ability to return the economy to the original or similar state, pointing to its resilience which considered to be an ability to govern to anticipate, understand, and react to adverse influences, crises, over time. (Barbera et al., 2017; Lee & Chen, 2021). Surprisingly, our results reveal other structural breaks in the Slovak economy in the monitored period, too, except for the Global Financial Crisis in 2009 and the economic crisis resulting from the COVID-19 crisis after 2020.

In the monitored period 2005-2022, with the beginning related to the implementation of fiscal decentralization in the Slovak Republic, several crucial changes influencing the financing of local governments were observed. First, the economic expansion contributed to the increase in tax revenues. It supported the perception of the legislative arrangement tied to the tax reform in 2004 and fiscal decentralization in 2005 as appropriate. Besides, fiscal decentralization brought the system change in financing the local governments when fixed criteria on sharing tax revenues (personal income tax) facilitated financial planning (budget planning) at the local level. Subnational governments benefitted 93.8% of the shared tax, of which 70.3% was shifted to municipal budgets. Besides these critical tax revenues, municipalities increased tax rates on immovable property, presenting the second most crucial local tax revenue by 100% on average in 2005 (Business Alliance of Slovakia, 2021). Central government's answer to the Global financial crisis (2009) included the reduction of the share of sub-national governments from 93.8% to 87.3% since 2012 having 65.4% for municipalities, its slight increase to 88.9% in 2014, 95% in 2015, and 100% in 2016 up

to now (Maličká, 2017), with a correspondent share of municipalities presenting 67% in 2014, 65.8% in 2015, and 70% in 2016 up to now. According to data provided by the Business Alliance of Slovakia (2021), Slovak municipalities did not increase local taxes dramatically in times of austerity.

Nevertheless, they did it in 2019 when another increase of 100% was observed in immovable property tax rates since 2020. Simultaneously, municipalities also increased the waste fee and other local taxes. In this manner, they tried to deal with legislative changes in Act No. 595/2003 Coll. on income tax, mainly related to the increase of the minimum wage, the introduction of a recreation allowance, the increase of wages in the field of education, and public administration, and the increase of the non-taxable part of the taxpayer's tax base (ZMOS, 2020). Since 2021, other changes in tax legislation leading to additional tax relief have been made (Čandik, 2020). According to the Programme Statement of the Government of the Slovak Republic for the period 2020-2024, the central government considered changes to the local tax mix by creating additional shared taxes (Government Office of the Slovak Republic, 2020), which were not implemented in practice. However, with the arrival of the multi-crisis, the municipalities must face increased expenses, which they currently cover from their budgets (Špačková et al., 2023).

3. Research objective, methodology, and data

The analysis examines the vulnerability and resilience of Slovak municipalities considering six financial indicators of local financial management with an emphasis on the following periods of crises - the Global Financial Crisis in 2009, the economic crisis resulting from COVID-19 crises after 2020, and subsequent periods of recovery. Moreover, the Slovak municipalities are divided according to size categories to reflect the fragmented residential structure in the Slovak Republic (Maličká & Mourão, 2022; Jüptner & Klimovský, 2021) and to ensure a higher degree of homogeneity within the created group. The analysis takes place from 2005 – 2022 and begins in 2005 due to fiscal decentralization (Maličká, 2019) in the Slovak Republic, which presents a systematic change in funding Slovak local self-government. Besides, the other analysis limitation is linked to the data availability since 2005.

Financial indicators that are directly derived from the budget categories of local governments are, among other things, the result of fiscal policy, which is one of the essential tools available to the government, not only of the Slovak Republic (Klimanov et al., 2020). Fiscal policy is also a manifestation of economic resilience, which is affected by shocks in the form of financial crises. Through fiscal policy, each economy influences the response to crises and managing these crises in post-crisis periods (Briguglio et al., 2009).

To calculate six financial indicators, we used the fiscal and budget categories of the economic classification of revenues and expenditures provided by the Ministry of Finance of the Slovak Republic (MF SR), acquired on Act No. 211/2000 Coll. on free access to information and amendments and additions to specific laws (Act on Freedom of Information). In addition, the data on the number of inhabitants is collected from the DATAcube database, provided by the Statistical Office of the Slovak Republic (SO SR, see Table 1). In the selection of financial indicators, we were inspired by the related research within the Slovak legal framework (Peková, 2004; Barbera et al., 2017; Wójtowicz & Hodžić, 2022; Law no. 583/2004 Coll. of the Act on Budgetary Rules of Territorial Self-Government).

Table 1:
Fiscal and demographic variables

Variable	Characteristic	Source
Fiscal variables		
Financial strength	Sum of local taxes, shared taxes and subsidies per inhabitant (in EUR)	MF SR Data on revenues and expenditures of 2,926 municipalities of the Slovak Republic according to economic classification in thousands of EUR. (2005 – 2022)
Tax strength	Sum of local taxes and shared taxes per inhabitant (in EUR)	
Debt service	Share of principal and interest payments on current revenues (%)*	
Total debt	Share of received loans on current revenues (%)* (Current revenues + capital revenues – current expenditures – capital expenditures)/(current revenues - capital revenues) (%)*	
Basic balance		
Total profit/loss	Total revenue – total expenditure per inhabitant (in EUR)**	
Demographic variables		
Population size	Number of inhabitants on January 1st of the correspondent year	SO SR (DATAcube) (2005-2022)
Derived variables		
Size category	1 if population <199;	Own processing based on the methodology of the SO SR (DATAcube) (2005 – 2022)
	2 if 199< population <499;	
	3 if 499 < population <999;	
	4 if 999< population <1,999;	
	5 if 1,999< population <4,999;	
	6 if 4,999< population <9,999;	
	7 if 9,999< population <19,999;	
	8 if 19,999< population <49,999;	
	9 if 49,999< population <99,999;	
	10 if population>99.999.	

Note: * indicators are usually expressed using percentages that help their interpretation, in further analysis we proceed using shares. ** Current revenue + capital revenue + revenue financial operations – current expenditure – capital expenditure – expenditure financial operations per inhabitant (in EUR)

Source: Authors' own, 2024.

As part of monitoring the vulnerability and resilience of Slovak municipalities, we performed an analysis based on financial indicators computed for nine size categories, which is vital to consider according to Steccolini et al. (2017). Following the SO SR methodology, we can distinguish among ten size categories, but in size category 10, one municipality has more than 99,999 inhabitants. Since it is impossible to compute the dispersion within a group with only one observation, this size category is removed from further analyses. Besides, MF SR provided us with data on 2,926 local budgets, including the budget of the capital city Bratislava as a whole and the second biggest city in SR – Košice, except for their city municipalities that have their budgets. These two cities have more than 100,000 inhabitants, but we excluded them from the sample, too, to avoid duplicities because of encountering their city municipalities in the sample. The final sample thus consists of 2,923 Slovak municipalities with their local budgets. Based on this, we proceeded to perform the analysis only for nine size categories (for more details, see Tab.1). In Slovak circumstances, we identified the presence of a fragmented residential structure, i.e., a large number of small local governments (municipalities from size categories 1, 2, or 3) with a small number of inhabitants (Lukáčová & Maličká, 2023; Maličká & Mourão, 2022; Jüptner & Klimovský, 2021). Table 2 presents the descriptive statistics; we also listed the number of observations, representing the available data for individual financial and demographic indicators.

Table 2:

Descriptive statistics

Variables	No. of obs.	Min	Max	Mean	Median	St.dev.
Financial strength	49,603	0	1662.16	406.89	389	307.70
Tax strength	49,708	2.49	701.37	237.68	251.05	153.65
Debt service	43,815	0	0.98	0.04	0.02	0.07
Total debt	40,914	0	2.61	0.08	0	0.22
Basic balance	46,213	-2.24	1	-0.062	-0.01	0.24
Total profit/loss	44,258	-486.29	320.25	3.57	2.57	66.66
Population size	52,668	7	476,922	113.01	656	10,791.93
Size category	52,668	1	10	3.09	3	1.52

Source: Authors' own, 2024.

To identify and remove extreme values for correct dispersion (variability) calculations, we calculated the Interquartile Range in the analysis, which is used when the data distribution is asymmetric. The interquartile range is used to identify quartiles of the analyzed data scale to outliers that were excluded for further analyses (Dash et al., 2023; Vinutha et al., 2018; Greco et al., 2023).

Inspired by the papers of Barbera et al. (2016), Barbera et al. (2017), and Barbera

et al. (2020), to express the vulnerability and resilience of municipalities, we focus on measuring the dispersion (variability) of selected financial indicators. The abovementioned authors refer to the volatility of different fiscal indicators and synthetic financial performance measures of local budgets. The variability of fiscal variables over time and their visualization is considered in Barbera et al. (2016). Barbera et al. (2020) and Malkina (2022) employ the standard deviation in their paper to measure the volatility of selected fiscal indicators, too. Standard deviation belongs to standard measures of volatility/variability. In the literature on resilience, there are employed other measures, too, e.g. growth rates (Giannakis & Bruggeman, 2020; Malkina, 2022), but the main goal resists revealing the sensitivity via the annual variations (Barbera et al., 2016; Arbolino & Di Caro, 2021), change of directions and fluctuations of the indicators in question (Fekete, 2018; Giannakis & Bruggeman, 2020). However, when explaining vulnerability and resilience in terms of risk (e.g., Holzmann et al. 2008), the risk is also measured using the variability measures (Markowitz, 1990).

To unveil the changes in financial indicators inside the quasi-homogenous group of Slovak municipalities (classified according to the size category), we employ the basic variability measure and focus on the changes in their directions. The assumption of municipalities being vulnerable to external shocks is linked to an increase in observed variability, which refers to significantly different reactions of municipalities to external stimuli. The assumption of being the municipality resilient refers to the ability to return to the initial circumstances. Since specific initial variability within size categories is already observed in the year 2005 and we want to find out the sensitivity of local governments to changes compared to the base year (considering the assumptions on vulnerability and resilience), we use the basic indexing method. Thus, after excluding the extreme values, for a better representation of the measured values, we formulate the observed variability of indicators in the form of indexes, where the values from 2005 represented 100 % of the measured value.

To summarize our quantitative approach, we employ several research methods in the analysis after sorting the municipalities into size categories and computing financial indicators. First, we proceeded to remove the extreme values of the financial indicators for all municipalities of the Slovak Republic. Second, we measured vulnerability and resilience by measuring the dispersion of six indicators of local financial performance (Barbera et al., 2017; Malkina, 2022). We measure resilience and vulnerability by the standard deviation of a sample of data. Third, we computed the indices linked to 2005 (2005=100%) for each size category and financial indicator dispersion due to the initial point referring to fiscal decentralization.

In many available studies, similar research questions are mainly solved through qualitative methods through interviews or surveys, which we decided to enrich with quantitative analysis (Lodge & Hood, 2012; Posner & Sommerfeld, 2013).

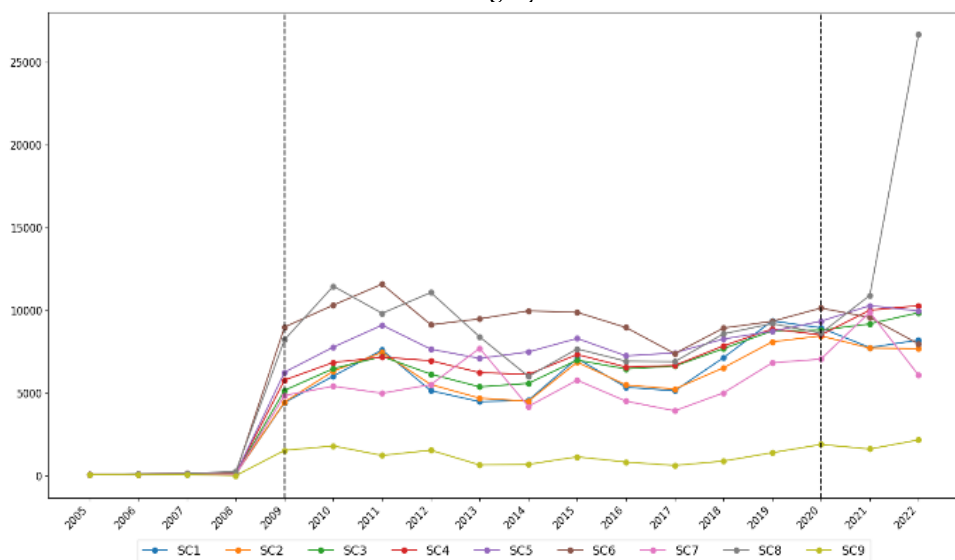
4. Results and Discussion

We calculated the dispersion from six financial indicators expressing the financial performance of the Slovak Republic municipalities. The calculation of variability is the standard deviation calculation (STDEV). In Fig. 1 – 6, results of tracking the dispersion of six financial indicators in 2005 – 2022 of 2,923 local governments in the Slovak Republic according to their size category (calculated from the numbers of inhabitants) are displayed. Just to keep in mind, we use the indexation method where 2005 presents 100% due to two facts. First, 2005 is the year of implementation of fiscal decentralization in the Slovak Republic. Thus, it presents the systematic change in local financial management. We might consider it a structural change. Second, the limitation of the dataset is linked to the MF SR, which provides data from 2005. In the graphical representation of analysis results, we point out eras of austerity - The Global Financial Crisis from 2009 and the crisis that arose in connection with the COVID-19 pandemic after 2020, often named the multicrisis.

Financial and tax strength indicators (Fig. 1 – 2) show an extreme increase in standard deviation. For both indicators, a sharp increase between 2008 and 2009 can be observed. The results clearly show that bigger size categories 5, 6, and 8 are the most vulnerable (the mentioned size categories reach maximum values) during the Global Financial Crisis from 2009.

Figure 1:

STDEV of financial strength indicator of Slovak municipalities according to the size category

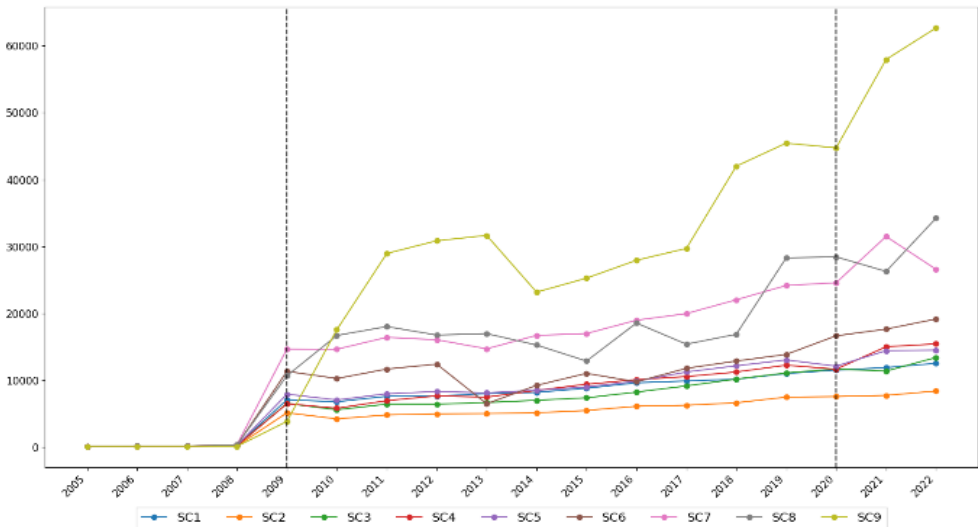


Source: Authors' own, 2024.

In the case of tax strength (Fig. 2), the indexed standard deviation as a dispersion measure shows unequal development of municipalities within the size categories, especially in more extensive size categories (7,8,9), when the dispersion increases in the monitored period. It might point to different intensities of tax revenues per inhabitant caused by the different tax capacities of these municipalities. However, the regional disparities in the SR, when comparing the western part of the country (including the area of the capital city) to the rest of the country (central and eastern), are empirically proven (e.g., Michálek et al., 2018; Oláh et al., 2020; OECD, 2022). Besides, we can observe a different development of the dispersion between bigger and smaller size categories. When considering the composition of tax revenues of small and big municipalities (towns and cities), small municipalities suffer from insufficient tax revenues and depend on revenue from shared tax (Maličká, 2019; Maličká, 2021). However, the shared tax creates a substantive part of the tax revenues of all municipalities in the SR, so all of them react to cuts in income taxes in “bad times,” but generally, bigger municipalities can generate additional tax revenues due to a broader tax base (higher tax capacity). During the COVID-19 pandemic, the most apparent jump in these financial indicators is for size categories 6, 8, and 9, which are constantly growing from 2020 to 2022 (see Fig. 2). In this case, however, it is necessary to note that the standard deviation of the most influenced size categories of these indicators is the furthest from the starting value of the indicators from 2005. The results confirmed the OECD (2022) and Ahrens and Ferry (2020) research dealing with a problematic situation for municipalities managing COVID-19.

Figure 2:

STDEV of tax strength indicator of Slovak municipalities according to size category

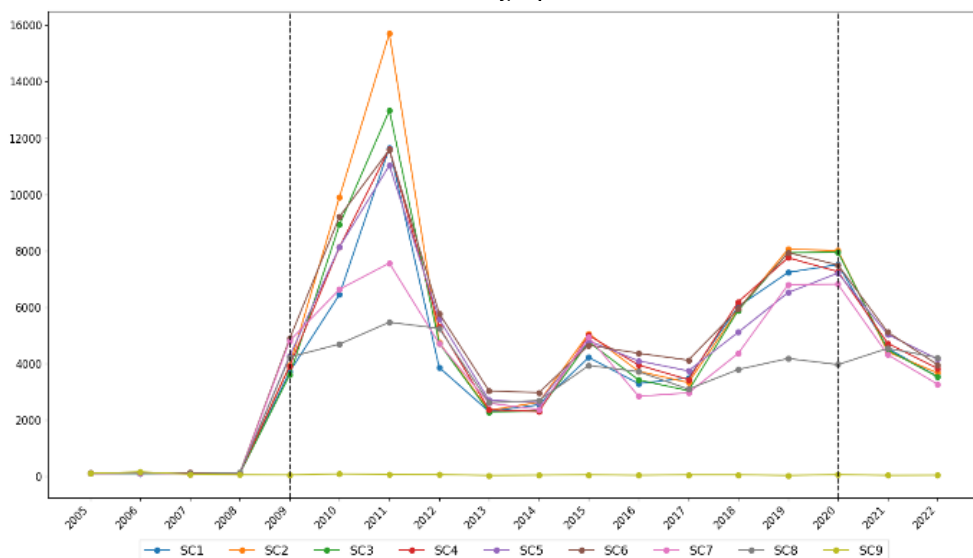


Source: Authors' own, 2024.

The maximum dispersion value when measuring total profit or loss (Fig. 3) is observed with some delay in the financial crisis period from 2009, mainly in small-size categories in Slovak municipalities. The delay is caused by the method of remittance of income from local governments' taxes with a one-year delay, based on Act no. 564/2004 Coll. Z. Act on the budgetary determination of income tax revenue of territorial self-government. The most vulnerable size categories, which react the most to changes in current and capital account items and financial operations per capita, are thus small-sized categories. The results prove that the values of the indices expressed from the standard deviations of this indicator changed rapidly after the 2009 crisis. It points to the massive differences among municipalities when dealing with crisis challenges. Surprisingly, our results do not confirm the impact of the COVID-19 pandemic and related crises, while an increase in dispersion is evidenced before the mentioned crisis. Higher dispersion pointing to specific changes in municipal financial management is tied to the taxation reform with several issues, when, e.g., tax bonuses on children doubled in the first half of 2019, and the increase of the non-taxable part of the tax base was stipulated, too (ZMOS, 2020). Thus, total personal income tax revenue (shared tax) has evidenced specific cuts. Moreover, another break was evident in 2015-2016. Morvay et al. (2017) mentioned a slight worsening of the Slovak economic condition when a decrease in the growth of GDP per capita, a decrease in investment activity, and gross fixed capital formation were observed in 2016.

Figure 3:

STDEV of total profit/loss indicator of Slovak municipalities according to size category

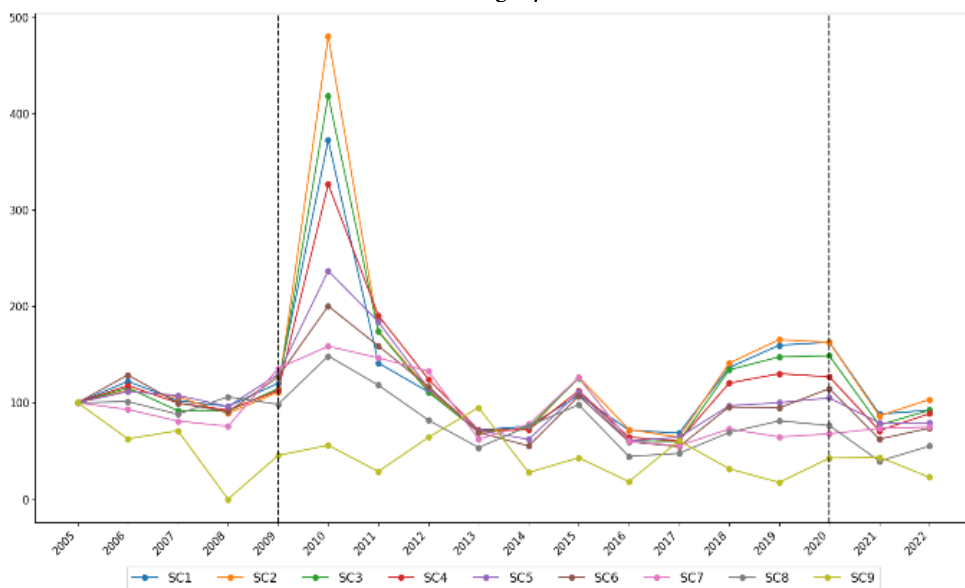


Source: Authors' own, 2024.

The results of the dispersion of basic balance indicators are also very similar. Municipalities in small-size categories responded to structural breaks the most in 2009, 2015-2016, and 2019 (Fig. 4).

Figure 4:

STDEV of basic balance indicator of Slovak municipalities according to size category

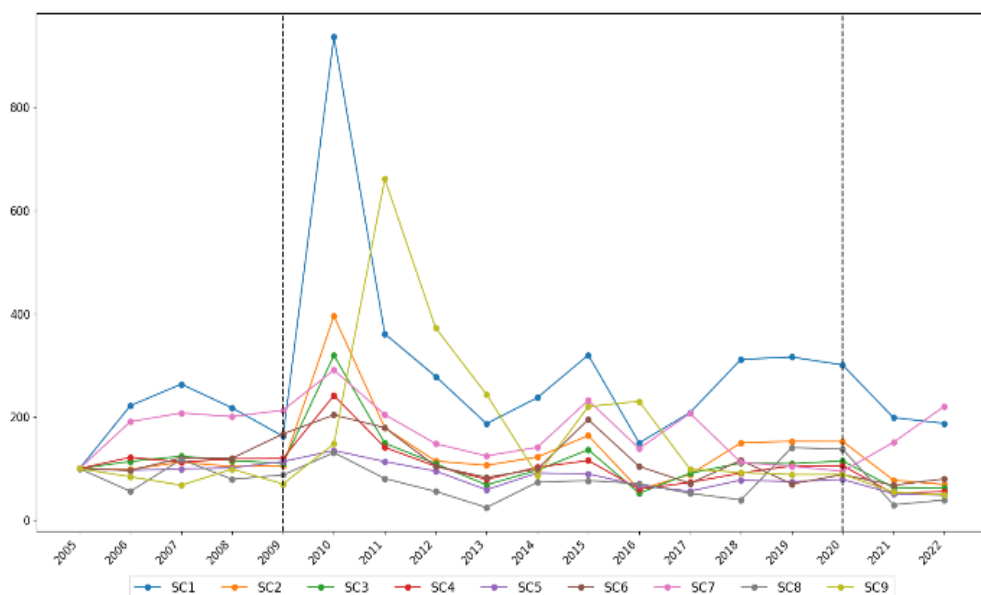


Source: Authors' own, 2024.

When considering the local indebtedness, the indexed dispersion of the indicator related to the outstanding debt uncovers its active use since the fiscal decentralization in 2005 (see Fig. 5) compared to previous financial indicators. Small-sized categories reacted to the crisis in 2009 evidently, considering both dispersion measures, which were also confirmed by Lentner and Hegedűs (2019) in other V4 countries (Visegrád cooperation). In the case of the size category 9, we can observe an abysmal increase after 2009 when computing the indices of standard deviation. Thus, we regard small-sized categories of municipalities as the most vulnerable in these times. In the case of the total debt financial indicator, higher volatilities in the dispersion relate to the economic slowdown in 2016 and personal income tax reform in 2019. In the COVID-19 pandemic, increasing inflation rate, war conflict, and energy crisis, no volatilities in dispersion have been observed. Municipalities did not fund their activities using returnable financial resources, contributing to higher indebtedness. It is confirmed by the results of the qualitative research provided by Euractive and ZMOS in 2023, too (Špačeková et al., 2023).

Figure 5:

STDEV of total debt indicator of Slovak municipalities according to size category



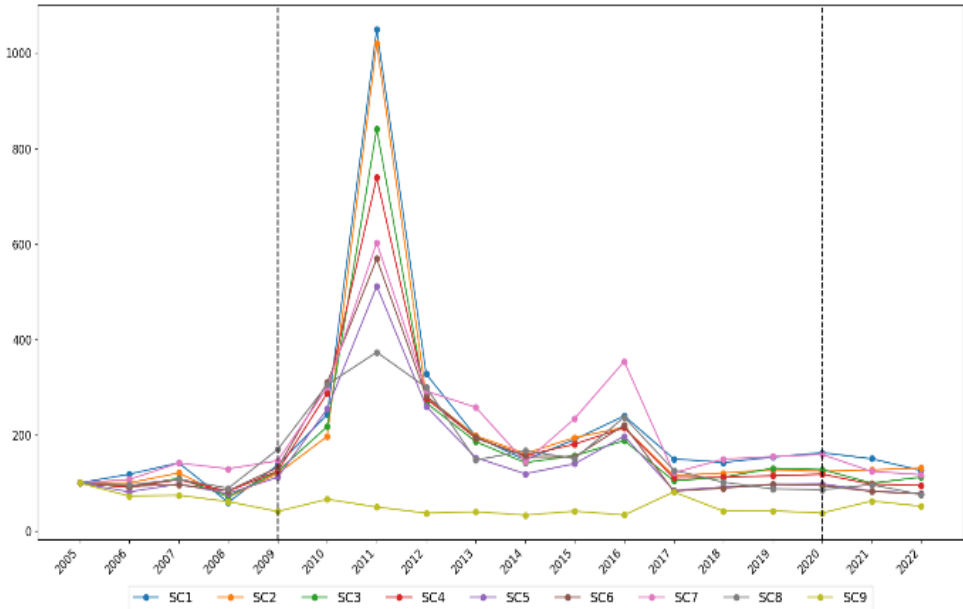
Source: Authors' own, 2024.

As well as total debt, the debt service indicator is important, too, in measuring the vulnerability and resilience of local governments because almost all systems of measuring fiscal vulnerability and resilience recognize the importance of the public debt by the ability to repay all debt obligations and recover from adverse effects that affect long term sustainable development (Wójtowicz & Hodžić, 2022). Wójtowicz and Hodžić (2022) consider total debt and other debt indicators to be an adequate measure of resilience given the role of public debt as a countercyclical tool against external shocks.

The indices of the dispersion of the debt service indicator (see Fig. 6) emulate the trend in the case of previous fiscal indicators computed for Slovak municipalities in various size categories. Again, small-sized categories are the most vulnerable to the Global Financial Crisis in 2009, as in the case of total debt, even though the indices expressing the dispersion of the mentioned indicator have been growing slowly since the year before the 2009 crisis. Besides, municipalities reacted to the economic slowdown in 2016. The changes in the 2009 crisis and 2016 slowdown were not repeated during and shortly after the COVID-19 crisis and multi-crisis after 2020.

Figure 6:

STDEV of debt service indicator of Slovak municipalities according to size category



Source: Authors' own, 2024.

However, it is possible that the observed period after this crisis is still short overall, and it is also influenced by the period in which Slovak municipalities did not have to repay their debts associated with the repayment of interest and principal related to loans. In connection with the arrival of the COVID-19 crisis, local governments received € 151,919,185 as refundable financial assistance from state financial assets. Of this, € 99,844,944 went to 1,719 municipalities and cities. The loans were to be repaid gradually in four equal payments in 2024, 2025, 2026, and 2027. However, in September 2023, the Ministry of Finance of the Slovak Republic approved the cancellation of these COVID loans, part of a discretionary policy, to all municipalities of the Slovak Republic (Ministry of Finance of the Slovak Republic, 2023).

5. Discussion

Generally, local governments have limited options for responding to negative impacts (Miller & Hokenstad, 2014). Therefore, Ahrens and Ferry (2020) claim that responses to unforeseen events should go beyond the local level. It is necessary to realize that, as is usual, the crises persisted for several years after its inception. All levels of government

have huge problems with the ability to absorb and manage damaging crises. However, local governments cannot adapt to these impacts, even from financial state resources and other constraints.

In the conditions of the Slovak Republic, in some cases, negative financial aspects created during eras of austerity last a more extended period, which is also confirmed by the results of analyses of this research. The analysis results confirm that the Slovak Republic's local governments react differently to the period of crises arising from external global influences (The Global Financial Crisis from 2009 and the multi-crisis related to the COVID-19 pandemic after 2020). Moreover, two other structural breaks were identified in Slovak economic circumstances in the monitored period. Slovak municipalities reacted to the economic slowdown in 2016 and taxation reform in 2019. The analysis results also confirm the results of other authors from Italy, the United Kingdom, and the USA. The authors of these studies confirmed that local governments respond differently to shocks depending on several factors. Among these factors, the authors included local governments' size and location. For example, in Italy, there is a difference between insular and continental local governments compared to local governments in the northern part of the country (Barbera et al., 2017; Lee & Chen, 2021).

The results show that the most vulnerable size categories during periods of austerity are small size categories, i.e., Slovak local governments with a small number of inhabitants, which present 70% of the sample (and thus almost all Slovak municipalities, Lukáčová & Maličká, 2023). However, as mentioned, small municipalities have limited possibilities to cope with essential external shocks. Besides, according to Jüptner & Klimovský (2021), the chaotic intergovernmental coordination multiplied by fragmented local governments makes it challenging to implement adequate fiscal policies at the local level because of the information asymmetry (Wright et al., 2022) between the central and local levels of government in Slovakia in the era of crisis. When considering more significant size categories, too, the regional disparities in the SR between the West and the rest of the country that are empirically proven (e.g., Michálek et al., 2018; Oláh et al., 2020; OECD, 2022) might cause different reactions in Slovak municipalities in terms of vulnerability and resilience considering the tax base determining the tax capacity.

The impact of the Global Financial Crisis on local financial management of Slovak municipalities is evident, as shown in our findings. The effect of the multi-crisis is not so noticeable yet. However, according to the research of Špačeková et al. (2023), local governments were under pressure in times of multi-crisis. Except for central government compensations, which did not cover their actual costs related to the pandemic crisis, military conflict in Ukraine, and energy crisis, half of the respondents mentioned that they implemented activities aimed at saving funds in the local government budget, others used their reserve funds or stopped their capital investments. The above was how they challenged the area of multi-crisis within their budgets. Except for the weaker external shock described by Morvay et al. (2017), tied to

a slight worsening of Slovak economic condition in 2016 when the growth of GDP per capita decreased, investment activity and gross fixed capital formation decreased, too, Slovak local governments had to face also to the other structural break during the monitored period. The tax reform performed in 2019 (the sum of tax bonuses on children, increase of the non-taxable part of the tax base, ZMOS 2020), thus total personal income tax revenue (shared tax), evidenced specific cuts. Slovak municipalities are vulnerable to structural breaks presented by reforms, especially taxation reforms, that also directly affect their tax receipts.

Implications for shaping public fiscal policies are in line with theory and evidence. As proposed by the Theory of Fiscal Federalism (e.g., Oates, 1999) and confirmed by, e.g., Ahrens and Ferry (2020), Miller & Hokenstad (2014), public fiscal policies dealing with the stabilization and redistribution in different phases of the business cycle should be the domain of the central level of the government. Besides, a sufficient level of local financial autonomy should be devoted to local governments, and the fiscal system (fiscal policy) should make them less sensitive to cuts in shared taxes, promoting the possibility of generating higher amounts of their tax revenues. However, in Slovakia, the question of low local financial autonomy is under scrutiny in research (e.g. Maličká, 2019 and Maličká, 2021), while the reduction of the municipalities' dependence on income taxes (shared taxes) that are sensitive to external shocks points to suggested changes in the immovable property taxation, which is a domain of municipalities (of course within the limits stipulated by the legislation). The answer proposed by the current stream of thinking, based on tying property tax rates to real estate market prices, may be subject to fluctuations in the real estate market, which will ultimately make it difficult to plan budgets and threaten municipalities' financial autonomy. In the field of reforms, policymakers should take into account the broader influence of reforming steps because municipalities are sensitive to unexpected changes in legislation. Better predictions of the reactions of local levels of government from the side of the central government, or simply to listen to the opinion and assumptions based on analyses of the other (affected) party in one voice (as it was, e.g., in the case mentioned by ZMOS, 2020) might be beneficial. Additionally, as Jüptner and Klimovský (2021) mention, policymakers should improve the inter-governmental communication channels, especially in times of crisis, to achieve better inter-governmental coordination.

6. Conclusions

The financial crisis of 2009, as well as the multi-crisis caused by the spread of the coronavirus infection beginning in 2020, was accompanied by negative financial phenomena in the conditions of local governments. In addition, it had a significant impact on the economies of most countries of the world, including the Slovak Republic.

This paper investigates the reaction of Slovak local governments to recently

observed global external shocks. The paper aims to examine the financial vulnerability and resilience of local governments in the Slovak Republic from 2005 to 2022 by selected analysis methods. The research was conducted on a sample of 2,923 local governments, sorted according to their size. According to the theoretical background, financial indicators were computed in the analysis to investigate financial vulnerability and resilience, and the standard deviation was calculated for each size category. Using the indexation linked to the year of fiscal decentralization in 2005, which aimed to enhance the fiscal autonomy of local governments in Slovakia, we performed to point out how the Slovak municipalities reacted to the eras of austerity - The Global Financial Crisis from 2009 and the multi-crisis starting in 2020. The results confirm our expectation that recently observed external shocks known as crises influence the local public sector, too. According to the analysis of financial indicator volatilities, the findings support the sensitivity of Slovak municipalities on structural breaks with different intensities of reactions when considering different size categories of municipalities, regarding the small-sized municipalities as one of the most vulnerable. Besides, the findings revealed that Slovak municipalities also reacted to other, less obvious, changes in the Slovak economy. Except for the critical years 2009 and 2020, there are evident changes in dispersions in 2016 linked to the slight economic slowdown and in 2019 linked to the reform of taxation.

The research realized in the conditions of Slovak local governments confirms the need for better budget planning, which will support financial health and improve the financial management of local governments in turbulent eras. Despite the need to support the improvement of local financial autonomy, one of the possibilities would be to strengthen the management of public institutions and their financial resilience by establishing tools for support in times of crises at higher government levels.

Acknowledgment

The paper is published with the support of the Scientific Grant Agency of the Ministry of Education, Science, Research and Sport of the SR and the Slovak Academy of Sciences within the projects 1/0681/22 and 1/0646/23 and the Slovak Research and Development Agency within the project APVV-21-0318.

References

Act on budgetary regulations of territorial self-government and amendments and additions to certain laws. Act number: 583/2004 Coll. Collection of laws of the Slovak Republic. <https://www.slov-lex.sk/pravne-predpisy/SK/ZZ/2004/583/20240501>

- Act on the budgetary determination of income tax revenue of territorial self-government and amendments and additions to certain laws. Act number: 564/2004 Coll. Collection of laws of the Slovak Republic. <https://www.slov-lex.sk/pravne-predpisy/SK/ZZ/2004/564/20240501>
- Act of the Slovak Republic on Free Access to Information and Amendments to Certain Acts (Act on Freedom of Information). Act number: 211/2000. Collection of laws of the Slovak Republic. Available online: <https://www.slov-lex.sk/pravne-predpisy/SK/ZZ/2000/211/20230101>
- Ahrens, T., & Ferry, L. (2020). Financial Resilience of English Local Government in the Aftermath of COVID-19. *Journal of Public Budgeting, Accounting & Financial Management*, 32(5), 813–823. <https://doi.org/10.1108/JPBAFM-07-2020-0098>
- Arbolino, R., & Di Caro, P. (2021). Can the EU Funds Promote Regional Resilience at Time of Covid-19? Insights from the Great Recession. *Journal of Policy Modeling*, 43(1), 109–126. <https://doi.org/10.1016/j.jpolmod.2020.10.001>
- Arunachalam, M., Saravanavel, J., & Kochuparampil, A. J. (2023). PCA-based Approach for Mapping Social Vulnerability to Hazards in the Chennai Metropolitan Area, East Coast of India. *Annals of GIS*, 29(4), 529–552. <https://doi.org/10.1080/19475683.2023.2226189>
- Barbera, C., Guarini, E., & Steccolini, I. (2016). Italian Municipalities and the Fiscal Crisis: Four Strategies for Muddling Through. *Financial Accountability and Management*, 32(3), 335–361.
- Barbera, C., Guarini, E., & Steccolini, I. (2020). How do Governments Cope with Austerity? The Roles of Accounting in Shaping Governmental Financial Resilience. *Accounting, Auditing & Accountability Journal*, 33(3), 529–558. <https://doi.org/10.1108/AAAJ-11-2018-3739>
- Barbera, C., Jones, M., Korac, S., Saliterer, I., & Steccolini, I. (2017). Governmental Financial Resilience under Austerity in Austria, England and Italy: How do Local Governments Cope with Financial Shocks? *Public Administration*, 95(3), 670–697. <https://doi.org/10.1111/padm.12350>
- Bhamra, R., Dani, S., & Burnard, K. (2011). Resilience: the Concept, a Literature Review and Future Directions. *International Journal of Production Research*, 49(18), 5375–5393. <https://doi.org/10.1080/00207543.2011.563826>
- Bloom, D. E. Cadarette, D. & Sevilla, J. P. (2018). Epidemics and Economics. Managing the Risks. *Finance & Development* 55(2), 46 – 49.

- Briguglio, L., Cordina, G., Farrugia, N., & Vella, S. (2009). Economic Vulnerability and Resilience: Concepts and Measurements. *Oxford Development Studies*, 37(3), 229–247. <https://doi.org/10.1080/13600810903089893>
- Business Alliance of Slovakia. (2021, February 22). *Cities will not help entrepreneurs with property taxes in 2021*. <https://www.alianciapas.sk/mesta-podnikatelom-danami-nehnutelnosti-v-roku-2021-nepomozu-2/>
- Cohen, S., & Hlepas, N. (2017). Financial Resilience of Greek Local Governments. In *Public policy and governance* (pp. 135–152). <https://doi.org/10.1108/s2053-769720170000027008>
- Čandík, L. (2020, December 22). *Changes in income tax from 1.1.2021*. TaxWise. <https://taxwise.sk/en/zmeny-v-dani-z-prijmov>
- Darnhofer, I. (2014). Resilience and Why It Matters for Farm Management. *European Review of Agricultural Economics*, 41(3), 461–484. <https://doi.org/10.1093/erae/jbu012>
- Dash, C. S. K., Behera, A., Dehuri, S., & Ghosh, A. (2023). An Outliers Detection and Elimination Framework in Classification Task of Data Mining. *Decision Analytics Journal*, 6, 100164. <https://doi.org/10.1016/j.dajour.2023.100164>
- Davoudi, S., Shaw, K., Haider, L. J., Quinlan, A., Peterson, G. D., Wilkinson, C., Fünfgeld, H., McEvoy, D., Porter, L., & Davoudi, S. (2012). Resilience: A Bridging Concept or a Dead End? “Reframing” Resilience: Challenges for Planning Theory and Practice Interacting Traps: Resilience Assessment of a Pasture Management System in Northern Afghanistan Urban Resilience: What Does it Mean in Planning Practice? Resilience as a Useful Concept for Climate Change Adaptation? The Politics of Resilience for Planning: A Cautionary Note. *Planning Theory & Practice*, 13(2), 299–333. <https://doi.org/10.1080/14649357.2012.677124>
- Duit, A. (2016). Resilience Thinking: Lessons for Public Administration. *Public Administration*, 94(2), 364–380. <https://doi.org/10.1111/padm.12182>
- Fekete, A. (2018). Societal Resilience Indicator Assessment Using Demographic and Infrastructure Data at the Case of Germany in Context to Multiple Disaster Risks. *International Journal of Disaster Risk Reduction*, 31, 203–211. <https://doi.org/10.1016/j.ijdrr.2018.05.004>
- Giannakis, E., & Bruggeman, A. (2020). Regional disparities in economic resilience in the European Union across the urban–rural divide. *Regional Studies*, 54(9), 1200–1213. <https://doi.org/10.1080/00343404.2019.1698720>

- Government Office of the Slovak Republic. (2020). Programme Statement of the Government of the Slovak Republic for the period 2020-2024. Government Office of the Slovak Republic, Bratislava. <https://www.vlada.gov.sk/>
- Greco, L., Luta, G., & Wilcox, R. R. (2023). On Testing the Equality Between Interquartile Ranges. *Computational Statistics*. <https://doi.org/10.1007/s00180-023-01415-8>
- Gurnani, S. (2016). The Financial Crisis in Portugal: Austerity in Perspective. In *The Library Research Prize*. Lehigh University. https://preserve.lib.lehigh.edu/islandora/object/preserve%3AAbp-8425504?solr_nav%5Bid%5D=451af89bfbf864c7c3a7&solr_nav%5Bpage%5D=0&solr_nav%5Boffset%5D=1
- Hamel, G., & Välikangas, L. (2003). The Quest for Resilience. *Harvard Business Review*, 81(9), 52–63. <https://hbr.org/2003/09/the-quest-for-resilience>
- Hochrainer-Stigler, S., Zhu, Q., Ciullo, A., Peisker, J., & Van Den Hurk, B. (2023). Differential Fiscal Performances of Plausible Disaster Events: A Storyline Approach for the Caribbean and Central American Governments under CCRIF. *Economics of Disasters and Climate Change*, 7(2), 209–229. <https://doi.org/10.1007/s41885-023-00126-0>
- Holling, C. S. (1973). Resilience and Stability of Ecological Systems. *Annual Review of Ecology and Systematics*, 4(1), 1–23. <https://doi.org/10.1146/annurev.es.04.110173.000245>
- Holzmann, P., Boudreau, T., Holt, J., Lawrence, M., & O'Donnell, M. (2008). *The Household Economy Approach: A guide for programme planners and policy-makers* (1st ed.). Save the Children UK. <https://resourcecentre.savethechildren.net/document/household-economy-approach-guide-programme-planners-and-policy-makers/>
- Hood, C. (1991). A Public Management for all Seasons? *Public Administration*, 69(1), 3–19. <https://doi.org/10.1111/j.1467-9299.1991.tb00779.x>
- Jüptner, P., & Klimovský, D. (2021). Vertical and Horizontal Intergovernmental Relations During the First Wave of the COVID-19 Crisis: Experience from the Extremely Fragmented CEE Countries. *Local Government Studies*, 48(2), 232–250. <https://doi.org/10.1080/03003930.2021.1944858>
- Klimanov, V., Kazakova, S., & Mikhaylova, A. (2020). Economic and Fiscal Resilience of Russia's Regions. *Regional Science Policy & Practice*, 12(4), 627–640. <https://doi.org/10.1111/rsp3.12282>
- Lee, S., & Chen, G. (2021). Understanding Financial Resilience from a Resource-based View: Evidence from US State Governments. *Public Management Review*, 24(12), 1980–2003. <https://doi.org/10.1080/14719037.2021.1955951>

- Lentner, C., & Hegedűs, S. (2019). Local Self-Governments in Hungary: Recent Changes through Central European Lenses. *Central European Public Administration Review*, 17(2), 51–72. <https://doi.org/10.17573/cepar.2019.2.03>
- Linnenluecke, M. K., & Griffiths, A. (2013). Firms and Sustainability: Mapping the Intellectual Origins and Structure of the Corporate Sustainability Field. *Global Environmental Change*, 23(1), 382–391. <https://doi.org/10.1016/j.gloenvcha.2012.07.007>
- Lobo, F. C., & Ramos, P. N. (2011). O Enquadramento Legal do Endividamento Municipal em Portugal. *Revista Portuguesa De Estudos Regionais*, 28, 57–69. <https://doi.org/10.59072/rper.vi28.333>
- Lodge, M., & Hood, C. (2012). Into an Age of Multiple Austerities? Public Management and Public Service Bargains across OECD Countries. *Governance*, 25(1), 79–101. <https://doi.org/10.1111/j.1468-0491.2011.01557.x>
- Lukáčová, J., & Maličká, L. (2023). Women Mayors in the Slovak Republic in the last two Decades: The Municipalities Size Category Perspective. *Geographical Journal*, 75(2), 177–195. <https://doi.org/10.31577/geogrcas.2023.75.2.09>
- Mailand, M. (2014). Austerity Measures and Municipalities: the Case of Denmark. *Transfer: European Review of Labour and Research*, 20(3), 417–430. <https://doi.org/10.1177/1024258914538212>
- Maličká, L. (2017). Determinants of the Municipal Indebtedness in the Slovakia. *Politická Ekonomie*, 65(3), 301–315. <https://doi.org/10.18267/j.polek.1145>
- Maličká, L. (2019). Formal Dimension of Fiscal Decentralization in the Context of Vertical Fiscal Imbalance and Financial Autonomy of Municipalities in Slovakia. *Politická ekonomie*, 67(3), 273–290. <https://doi.org/10.18267/j.polek.1240>
- Maličká, L. (2021). Financial Autonomy of Local Governments in the Slovak Republic: a Panel Data Investigation. *Ekonomický Časopis*, 69(7), 669–686. <https://doi.org/10.31577/ekoncas.2021.07.01>
- Maličká, L., & Mourão, P. R. (2022). Political Budget Cycles at the Municipal Level in Slovakia: between Structural Dependence and Electoral Exhibitionism. *Local Government Studies*, 49(5), 1045–1073. <https://doi.org/10.1080/03003930.2022.2117165>
- Malkina, M. (2022). The Resilience of the Russian Regional Economies to the 2020 Pandemic. *Regional Research of Russia*, 12(3), 309–320. <https://doi.org/10.1134/s2079970522700034>

- Markowitz, H. M. (1990). *Mean-Variance Analysis in Portfolio Choice and Capital Markets*. Blackwell.
- Martin, R. (2012). Regional Economic Resilience, Hysteresis and Recessionary Shocks. *Journal of Economic Geography*, 12(1), 1–32. <https://doi.org/10.1093/jeg/lbr019>
- Michálek, A., Podolák, P., & Madajová, M. S. (2018). Dynamics of Regional Disparities in Slovakia in 2001 and 2011. *Bulletin of Geography. Socio-Economic Series*, 42(42), 99–114. <https://doi.org/10.2478/bog-2018-0033>
- Miller, D.B., & Hokenstad, T. (2014). Rolling Downhill: Effects of Austerity on Local Government Social Services in the United States. *Journal of Sociology & Social Welfare*, 41(2) 93–107. <https://doi.org/10.15453/0191-5096.3952>
- Ministry of Finance of the Slovak Republic. Methodological guidelines of the Ministry of Finance of the Slovak Republic and explanatory notes to the economic classification of the budget classification Ministry of Finance of the Slovak Republic. <https://www.mfsr.sk>.
- Ministry of Finance of the Slovak Republic. (2023). *The Union of Slovak Cities and ZMOS accepted our helping hand*. <https://www.mfsr.sk/sk/media/tlacove-spravy/cast-samosprav-prijala-nasu-pomocnu-ruku.html>
- Morvay, K., Frank, K., Hudcovský, M., Jeck, T., Lábaj, M., & Šikulová, I. (2017). *Hospodársky vývoj Slovenska v roku 2016 a výhľad do roku 2018*. VEDA, vydavateľstvo Slovenskej akadémie vied. https://ekonom.sav.sk/uploads/journals/362_hospodarsky_vyvoj_sr_v_r_2016_2.pdf
- Oates, W. E. (1999). An Essay on Fiscal Federalism. *Journal of Economic Literature*, 37(3), 1120–1149. <https://doi.org/10.1257/jel.37.3.1120>
- OECD. (2022). *Regional Well-being in OECD Countries: Slovak Republic*. <https://www.oecd.org/regional/SVK-RCG2022.pdf>
- Oláh, J., Hajduová, Z., Lacko, R., & Andrejovský, P. (2020). Quality of Life Regional Differences: Case of Self-Governing Regions of Slovakia. *Sustainability*, 12(7), 2924. <https://doi.org/10.3390/su12072924>
- Padovani, E., Iacuzzi, S., Jorge, S., & Pimentel, L. (2021). Municipal Financial Vulnerability in Pandemic Crises: a Framework for Analysis. *Journal of Public Budgeting, Accounting & Financial Management*, 33(4), 387–408. <https://doi.org/10.1108/jpbafm-07-2020-0129>
- Peková, J. (2004). *Hospodaření a finance územní samosprávy*. Management Press, s.r.o.

- Peters, B. G. (2011). Governance Responses to the Fiscal Crisis: Comparative Perspectives. *Public Money & Management*, 31(1), 75–80. <https://doi.org/10.1080/09540962.2011.545551>
- Pickett, S. T. A., Cadenasso, M. L., & Grove, J. M., (2004). Resilient Cities: Meaning, Models, and Metaphor for Integrating the Ecological, Socio-Economic, and Planning Realms. *Landscape and Urban Planning*, 69(4), 369–384. <http://dx.doi.org/10.1016/j.landurbplan.2003.10.035>
- Posner, P. L., & Sommerfield, M. (2013). The Politics of Fiscal Austerity: Democracies and Hard Choices. *OECD Journal on Budgeting*, 1, 141–174. https://read.oecd-ilibrary.org/governance/the-politics-of-fiscal-austerity_budget-13-5k3w6lk42l33#page2
- Sedmihradská, L. (2018). Inter-Municipal Cooperation in the Czech Republic: A Public Finance Perspective. *NISPACee Journal of Public Administration and Policy*, 11(2), 153-170.
- Schäfer, A., & Streeck, W. (2013). *Politics in the Age of Austerity*. Polity Press.
- Steccolini, I., Jones, M., & Saliterer, I. (Eds.). (2017). *Governmental Financial resilience: International perspectives on how local governments face austerity* (Vol. 27). Emerald Publishing Limited. <https://www.emerald.com/insight/publication/doi/10.1108/S2053-7697201727>
- Špačeková, M., Marcinčin, A., & Maličká L. (2023). *Financing of Municipalities*. [orig. Financovanie obcí] Project EU cohesion policy for successful Slovak regions (EUCoSK). Policy Paper. The Association of Towns and Communities of Slovakia (ZMOS) and Technical University of Košice. https://www.zmos.sk/eucosk.html#m_522045
- Vinutha, H. P., Poornima, B., & Sagar, B. M. (2018). Detection of Outliers Using Interquartile Range Technique from Intrusion Dataset. In S. Satapathy, J. Tavares, V. Bhateja, & J. Mohanty (Eds.), *Information and Decision Sciences. Advances in Intelligent Systems and Computing* (Vol. 701). Springer. https://doi.org/10.1007/978-981-10-7563-6_53
- Whitfield, D. (2012). *In Place of Austerity: Reconstructing the economy, state and public services*. Spokesman Books.
- Wójtowicz, K., & Hodžić, S. (2022). Financial Resilience in the Face of Turbulent Times: Evidence from Poland and Croatian Cities. *Sustainability*, 14(17), 10632. <https://doi.org/10.3390/su141710632>
- Wright, G., & Slukhai, S. (2021). Decentralization Policy in Ukraine: How Voluntary Amalgamation, Inter-Municipal Cooperation and Fiscal Incentives Impacted the

- Local Government System. *The NISPAcee Journal of Public Administration and Policy*, 14(1), 311–343. <https://doi.org/10.2478/nispa-2021-0012>
- Wright, G., Slukhai, S., & Yakymchuk, B. (2022). Amalgamation and Local Finance: A Case Study of Ukraine. *Central European Public Administration Review*, 20(2), 147-168. <https://doi.org/10.17573/cepar.2022.2.07>
- Zafra-Gómez, J. L., López-Hernández, A. M., & Hernández-Bastida, A. (2009). Developing an Alert System for Local Governments in Financial Crisis. *Public Money and Management/Public Money & Management*, 29(3), 175–181. <https://doi.org/10.1080/09540960902891731>
- ZMOS. (2020). ZMOS v prehľade aktivít 2019: Komunálny spravodajca. https://www.zmos.sk/zmos-v-prehlade-aktivit-2019-oznam/mid/454068/.html#m_454068