Comparative Economic Research. Central and Eastern Europe
Volume 28, Number 3, 2025
https://doi.org/10.18778/1508-2008.28.18

Fiscal (Un)Sustainability in Practice: Local Government Finance in Visegrad Economies

Tomasz Uryszek https://orcid.org/0000-0003-4892-3747
Ph.D., Associate Professor at the University of Lodz, Faculty of Economics and Sociology, Institute of Finance
e-mail: tomasz.uryszek@uni.lodz.pl

Agnieszka Kłysik-Uryszek https://orcid.org/0000-0001-6876-8751
Ph.D., Assistant Professor at the University of Lodz, Faculty of Economics and Sociology, Institute of Economics
e-mail: agnieszka.klysik@uni.lodz.pl

Abstract

The objective of this study is to evaluate the fiscal sustainability of Local Government Units (LGUs) in the Visegrad Group economies (Czechia, Hungary, Poland, and Slovakia; the V4), focusing on three key hypotheses: (1) LGUs in the V4 are involved in so-called Ponzi games; (2) the adverse effects of such games intensified during the economic recession, the COVID-19 crisis, and the war in Ukraine; (3) primary budget balances of LGUs impact the stabilization of their debt levels. The study spans 2001–2022, encompassing significant economic disruptions. The analysis utilizes fiscal sustainability assessments, including the primary gap indicator and criteria for Ponzi-like behaviors. Key findings reveal varying degrees of fiscal sustainability across the V4, with notable disparities in resilience and debt management. The implications and recommendations emphasize the need for enhanced fiscal discipline, targeted policy adjustments, and transparent governance frameworks to address identified vulnerabilities. The paper offers a comprehensive examination of LGU fiscal sustainability in Central European economies, offering insights for policymakers and enriching the discourse on public finance management in post-transitional economies.

Keywords: fiscal sustainability, Visegrad economies, local government, public debt, budget deficit, Ponzi games

JEL: E62, H72, H74

Funding information: T.U. – University of Lodz, Faculty of Economics and Sociology, Institute of Finance; .K.-U. – University of Lodz, Faculty of Economics and Sociology, Institute of Economics.
The percentage share of the Authors in the preparation of the work is: .U. – 50.00%, .K.-U. – 50.00%.
Declaration regarding the use of GAI tools: Not used.
Conflicts of interests: None.
Ethical considerations: The Authors assure of no violations of publication ethics and take full responsibility for the content of the publication.
Received: 3.06.2024. Verified: 13.11.2024. Accepted: 17.03.2025

Introduction

Public debt and budget deficits are common characteristics of many market economies. Public borrowing has been a preferred path for financing investment and current expenditures, and it is relevant for both central administrations and local government units (LGUs). This pattern is evident in numerous European Union (EU) member countries. Keynesians argue that both deficits and debt can positively influence economic development (Palatiello and Pilkington 2022). Conversely, neoclassical economists suggest that these factors may have negative effects on growth (Dombi and Dedák 2019; Misztal 2021). Nevertheless, forecasting public revenues and expenditures is crucial to managing deficits and debts effectively (Ewing et al. 2006). Additionally, the structure of the public debt market plays an important role for borrowers (Mataibayeva et al. 2019).

This research aims to evaluate the fiscal sustainability of LGUs in the Visegrad Group economies (Czechia, Hungary, Poland, and Slovakia), also known as the V4. This evaluation is anchored in three core hypotheses: LGUs in the V4 are involved in so-called Ponzi games; (2) the adverse effects of such games intensified during the economic recession, the COVID-19 crisis, and the war in Ukraine; (3) the values of LGUs' primary budget balances interfere with the stabilization of their debt volumes. The study period extends from 2001 to 2022, capturing significant events such as the global financial crisis, the COVID-19 pandemic, and the war in Ukraine.

This paper provides an overview of discussions on sustainable fiscal policy and investigates various methods used to assess fiscal stability. The research methodology employs two main approaches: first, we assess the primary gap indicator (a measure for short-term debt sustainability), and second, we evaluate the criteria for potential involvement in Ponzi games. The empirical portion of the paper presents the research results, with key conclusions and recommendations presented in the concluding section.

Literature review

The idea of fiscal stability has its roots in the writings of seminal economists like Adam Smith, David Hume, and David Ricardo (Rowley, Shughart, and Tollison 2002). The concept of fiscal stability in the contemporary literature encompasses various dimensions, with notable contributions from John and Kurian (2009), Adam (2015), Potrafke and Reischmann (2015), and Tsuchiya (2016), among others. Fiscal stability is crucial for government economic activities and public service delivery while being influenced by economic factors and regional economic risks (Fengze 2023). According to Kálmán (2023), no consensus has emerged in the literature, legislation, or legal enforcement regarding the substance of the concept of financial stability. Filipiak and Wyszkowska (2022) and Franek (2022) highlight the importance of fiscal stability in EU countries, and show how different factors, including financial crises and the COVID-19 pandemic, have impacted the public finance sector. They trace the evolution of fiscal stability towards public finance sustainability.

Many scholars have researched fiscal sustainability, especially in Central and Eastern European (CEE) contexts, including the V4, including Uryszek (2015; 2019), Sávai (2016), Krajewski,

Mackiewicz, and Szymańska (2016), Owusu (2021), Polat and Polat (2021), Wojtowicz and Hodzic (2021), and Grosu, Pintilescu, and Zugravu (2022), among others. While the outcomes of their research are not ambiguous, they are, to some extent, inconclusive. For example, Owusu (2021) rejected the fiscal sustainability hypothesis for ten CEE economies. By contrast, Polat and Polat (2021) state that fiscal policy is sustainable for the EU overall (excluding the PIIGS countries: Portugal, Italy, Ireland and Spain). Meanwhile, at the local government level, Wojtowicz and Hodzic (2021) observed a negative relationship between fiscal sustainability and efficiency in large Polish cities and stated there is a need for further research on the determinants of municipal financial sustainability.

The prevailing academic discourse on sustainable fiscal policy investigates the scale of public debt, intertemporal budget constraints, and levels of primary balances (Neck and Sturm 2008; Legrenzi and Milas 2012; Molendowski and Stanek 2012; Collard, Habib and Rochet 2015). A widely-held consensus among academics holds that fiscal authorities should avoid Ponzi games, suggesting that a continuous reliance on increasing debt, especially when benchmarked against metrics like GDP, is untenable (Wigger 2009; Minea and Villieu 2010; Martins-da-Rocha and Vailakis 2012).

A significant methodological challenge in discerning Ponzi-like behaviors among fiscal authorities is forecasting all future primary balances (net lending or net borrowing values), a process that is intrinsically susceptible to errors. The literature posits that genuine fiscal sustainability is not achieved merely by offsetting existing debt with new liabilities (Fan and Arghyrou 2013). A sustainable policy would necessitate that the aggregate of future discounted primary balances compensate for the initial level of debt, emphasizing the imperatives of maintaining primary budget surpluses and regulating public debt (Gevorkyan 2012). The significance of public trust, based on the assumption that authorities ardently seek and uphold fiscal sustainability, is paramount (Steger 2012).

Drawing upon the constructs of intertemporal budget constraints, McCallum (1992) argued that the rate of public debt growth should not outstrip the interest rate. Barro (1989) and Kremers (1989) further demonstrated that when economic growth lags the real interest rate, there's an attendant decline in the debt-to-GDP ratio.

Fiscal sustainability indicators provide a synthesized view of how an economy's fiscal policy deviates from the equilibrium by considering variables like public debt levels, economic growth trajectories, interest rates, and primary balances (Chalk and Hemming 2000). While these indices typically assume certainty in their calculations, Barnhill Jr. and Kopits (1998), Bohn (1995), Tanner and Samake 2008, and Hajdenberg and Romeu (2010) suggest that incorporating uncertainty would make the analyses more robust.

Statistical methods represent another significant approach to gauging fiscal sustainability (Burnside 2005). The pioneering work of Hamilton and Flavin (1986), which examined the sustainability of U.S. public debt, has sparked numerous analyses that focused on the stationarity and cointegration of macrofinancial variables, particularly public revenues and expenditures (Trehan and Walsh 1988; Baglioni and Cherubini 1993; Bohn 2007; Holmes, Otero, and Panagiotidis 2010; Westerlund and Prohl 2010; Afonso and Jalles 2016; Chen 2016).

In practice, indices for fiscal sustainability assessment at the local government level vary across nations and regions. For instance, the U.S. state of Michigan employs a set of metrics for fiscal oversight (Crosby and Robbins 2013).

Research has established links between local fiscal sustainability and multiple variables, including governance competencies (Okubo 2010; Tang et al. 2014), strategic development, intergovernmental fiscal relations (Ji, Ahn, and Chapman 2015; Szołno-Koguc 2021), spatial planning paradigms (Wójtowicz 2015; 2016), fiscal norms (Możdzierz 2015), decentralization levels (Maličká 2016), as well as institutional and organizational frameworks (Nam and Parsche 2001).

Data sources and research methods

This part of the study presents the research methods for assessing fiscal sustainability. These universal methods can be easily employed for time series analysis and international comparisons.

The first step of the research was to calculate the primary gap indicator employed as proposed by Blanchard (1990). It can be expressed as follows (see Blanchard 1990; Chalk and Hemming 2000, p. 8):

$$d^* = (r_t - n_t)b_t, \tag{1}$$

where:
d^* represents the level of primary balance needed to stabilize the debt-to-GDP ratio,
r_t is the real interest rate of local government sector debt in period t,
n_t is the real economic growth rate in period t,
b_t denotes the volume of public debt relative to GDP in period t.

A value higher than the current primary balance level suggests that the deficit is too large (or the surplus too small) to stabilize the debt ratio, indicating that the fiscal policy is imbalanced in the short run.

In the next step of the empirical research, the Ponzi condition was examined. It can be formally presented as:

$$b_t = \sum_{j=0}^{\infty} R(t, t+j)^{-1} d_{t+j}, \tag{2}$$

where:
b_t is the outstanding public debt to be repaid in period t relative to GDP,
d_{t+j} denotes the primary balance (reduced by public debt interest) relative to GDP,
$R(t, t+j) = \prod_{k=0}^{j} R_{t+k}$ is the discount factor applied between periods t and $t + j$,
$R_{t+k} = 1 + r_{t+k}$,

r_{t+k} represents the real interest rate of public debt instruments in period $t + kt + k$, which is assumed to be the same for all assets under the assumption of perfect foresight (O'Connell and Zeldes 1988).

Equation 2 formally describes a situation where the sum of all future discounted primary balances covers the existing debt level. If this criterion is met in a particular economy, the government (fiscal agent) is not engaging in a Ponzi games, and the fiscal policy can be deemed sustainable.

The empirical formula for studying fiscal sustainability was slightly modified. To avoid ex ante estimation errors, historical data were used (22 annual observations from 2001–2022). This period seems sufficiently long given the average maturities of public borrowing instruments (see: Eurostat 2017). The following formula was used:

$$\sum_{j=0}^{22} R(t, t+j)^{-1} d_{t+j} \geq 0. \tag{3}$$

Since debt volumes are large, initial requirements for the examined economies were relaxed. The objective was to verify whether the sum of discounted primary net lending/borrowing values at the local level during the observed period was at least positive. If so, it could be concluded that the local government sector in a particular economy was at least capable of undertaking a repayment path for the existing debt level.

Subsequently, the final condition for avoiding Ponzi games was checked. This involved examining whether the sum of primary net lending/borrowing values during a given period was capable of covering the initial debt level. This can be formally written as:

$$\sum_{j=0}^{22} R(t, t+j)^{-1} d_{t+j} \geq b_0, \tag{4}$$

where:
b_0 is the initial level of local government sector debt,
other symbols are as defined in equation 2.

The study did not apply formal stationarity and cointegration tests. Most popular tests like Dickey-Fuller or Phillips-Perron could not be used due to their significant issues with test power and finite sample size (see DeJong et al. 1992). The data series seemed too short even for the DF-GLS test, which is characterized by the best overall performance in small samples (see Elliott, Rothenberg, and Stock 1996).

The empirical data were sourced from Eurostat, covering 16 annual observations from 2001 to 2021. Additionally, data regarding the debt level of local governments in 2000 was used as the initial debt level for testing involvement in the Ponzi games. Data denominated in EUR and in percentages of GDP were utilized.

Empirical results

The starting point for the empirical research was the general analysis of the main aggregates related to the fiscal sustainability of the local government sector: the fiscal balance, primary balance, and debt. For clarity, the fiscal balance (FB) represents the local government sector's net borrowing or net lending as defined by ESA 2010. The primary balance (PB) refers to the primary net borrowing or net lending, which excludes the cost of public borrowing. Lastly, 'D' denotes debt borne by the local government sector. Table 1 presents the relevant data from 2001 to 2022 for the V4 countries.

Table 1. Fiscal balance, primary balance, and debt of local government units in the V4 economies (% of GDP)

Year	Czechia			Hungary			Poland			Slovakia		
	FB*	PB**	D***	FB*	PB**	D***	FB*	PB**	D***	FB*	PB**	D***
2001	−0.4	−0.4	1.6	0.1	0.2	1.1	−0.1	−0.1	1.3	0.0	−0.1	1.3
2002	−0.4	−0.4	1.8	−0.9	−0.8	1.5	−0.3	−0.3	1.7	0.3	0.4	1.3
2003	−0.4	−0.3	2.0	−0.2	−0.1	1.5	−0.4	−0.3	1.8	0.0	0.0	1.3
2004	0.0	0.1	2.3	−0.3	−0.2	1.6	0.2	0.3	1.8	0.5	0.5	1.2
2005	−0.1	0.1	2.4	−0.5	−0.4	1.8	−0.1	0.0	2.1	0.2	0.1	1.4
2006	−0.3	−0.1	2.5	−0.8	−0.8	2.3	−0.3	−0.2	2.4	−0.1	0.0	1.6
2007	0.3	0.4	2.4	−0.1	−0.2	3.0	0.0	0.1	2.2	0.1	0.1	1.7
2008	−0.2	−0.1	2.3	0.1	0.1	3.8	−0.2	−0.1	2.3	0.1	0.0	1.7
2009	−0.6	−0.7	2.3	−0.4	−0.9	4.1	−1.1	−1.1	3.0	−0.6	−0.8	2.1
2010	−0.4	−0.4	2.5	−0.8	−1.0	4.6	−1.3	−1.2	3.8	−0.8	−0.9	2.4
2011	−0.3	−0.3	2.5	0.6	0.4	4.3	−0.9	−0.6	4.2	0.0	0.0	2.6
2012	−0.1	−0.2	2.6	0.5	0.2	3.7	−0.4	−0.2	4.2	0.3	0.1	2.4
2013	0.3	0.2	2.8	2.5	2.5	1.5	−0.2	−0.1	4.3	0.3	0.2	2.2
2014	0.2	0.2	2.7	1.3	1.4	0.1	−0.3	−0.1	4.3	−0.1	−0.1	2.2
2015	0.6	0.7	2.4	0.2	0.2	0.2	−0.1	0.1	4.2	0.1	0.3	2.3
2016	1.0	1.0	1.9	0.3	0.3	0.2	0.3	0.4	3.9	0.5	0.7	2.2
2017	0.8	0.1	1.7	0.1	0.0	0.3	0.1	0.1	3.9	0.0	0.0	2.1
2018	0.4	0.0	1.6	0.1	0.0	0.5	−0.3	0.1	3.9	0.1	0.1	2.1
2019	0.6	0.0	1.5	−0.1	0.0	0.6	−0.2	0.1	3.9	0.2	0.0	2.1
2020	0.5	−0.1	1.5	0.1	−0.1	0.6	0.2	−0.1	4.2	0.2	−0.1	2.3
2021	0.9	0.0	1.4	0.2	0.0	0.6	0.6	0.2	3.9	0.0	0.1	2.3
2022	0.8	0.8	1.3	−0.3	−0.3	0.5	−0.4	−0.2	3.3	−0.4	−0.4	2.2
Aver.	0.1	0.0	2.1	0.1	0.0	1.7	−0.2	−0.1	3.2	0.0	0.0	1.9
Std. Dev.	0.5	0.4	0.5	0.7	0.8	1.5	0.4	0.4	1.0	0.3	0.4	0.4

* FB – fiscal balance of the local government sector (net borrowing/net lending according to ESA 2010).

** PB – primary balance of the local government sector (primary net borrowing/net lending according to ESA 2010); primary balance is a fiscal balance that excludes the cost of public borrowing.

*** D – debt of the local government sector.

Source: own elaboration based on Eurostat 2024.

Czechia managed to maintain a marginally positive fiscal balance over the observed period, with an average of 0.1 and a nearly neutral primary balance of 0.0. The debt for its local government sector hovered around an average of 2.1, with fluctuations denoted by a standard deviation of 0.5. This signifies moderate variations in local government debt levels throughout the years.

In contrast, Hungary's financial metrics showed average fiscal and primary balances of 0.1 and 0.0, respectively. Local government debt averaged 1.7. However, Hungary exhibited the greatest variability among the V4, with a standard deviation of 1.5. This sizable standard deviation suggests potential fiscal challenges or greater fiscal adjustments over the specified years.

Poland's fiscal landscape demonstrated a marginally negative tendency, with average fiscal and primary balances of –0.2 and –0.1, respectively. Notably, the country's local government debt was comparatively higher, averaging 3.2, indicating a relatively greater reliance on borrowing at the local government level.

Finally, Slovakia maintained a fiscal balanced, with both its fiscal and primary balances remaining relatively neutral. Local government debt averaged 1.9, demonstrating a moderate level of indebtedness.

In summary, while Czechia and Slovakia demonstrated fiscal resilience with mild to neutral averages in their respective balances, Poland's financial metrics leaned slightly negative. Hungary's highly variable debt levels suggest potential fiscal intricacies or significant fiscal adjustments during the 2001–2022 period.

Table 2 presents the primary gap indicator for local government units within the V4. This metric provides insights into fiscal sustainability in the short run, with a negative value indicating an imbalance in fiscal policy, suggesting the fiscal deficit is too large (or the surplus too small) to stabilize the debt ratio.

Table 2. The primary gap indicator for local government in the V4 (% of GDP)

	Czechia	Hungary	Poland	Slovakia
2001	–0.35	0.17	–0.12	0.04
2002	–0.36	–0.83	–0.29	0.37
2003	–0.31	–0.13	–0.34	0.11
2004	0.10	–0.24	0.27	0.60
2005	0.07	–0.43	–0.03	0.25
2006	–0.12	–0.77	–0.18	0.06
2007	0.43	–0.16	0.13	0.30
2008	–0.14	0.06	–0.14	0.22
2009	–0.73	–0.82	–1.08	–0.71
2010	–0.44	–0.99	–1.27	–0.77
2011	–0.35	0.45	–0.74	0.06
2012	–0.19	0.24	–0.34	0.32

	Czechia	Hungary	Poland	Slovakia
2013	0.24	2.51	–0.13	0.24
2014	0.22	1.30	–0.19	–0.09
2015	0.72	0.20	0.07	0.20
2016	1.04	0.30	0.40	0.53
2017	0.87	0.10	0.27	0.04
2018	0.42	0.11	–0.09	0.17
2019	0.62	–0.09	–0.02	0.25
2020	0.40	0.06	0.15	0.13
2021	0.92	0.22	0.79	0.11
2022	0.77	–0.31	–0.22	–0.41
Average	0.17	0.04	–0.14	0.09
Std. Dev.	0.51	0.75	0.46	0.34

Source: own calculations based on Eurostat n.d.

Analysis of the data reveals distinct patterns across the V4 countries. Czechia maintained a slightly positive average of 0.17 and a standard deviation of 0.51, suggesting relatively stable fiscal sustainability with moderate fluctuations. Slovakia follows closely with an average of 0.09, demonstrating a marginally balanced fiscal stance. Its standard deviation of 0.34 is the lowest among the V4, highlighting its consistency over the years. By contrast, Poland's average of –0.14 suggests a tendency towards short-term fiscal imbalance in the short run, with observable variations in fiscal measures across the years (standard deviation of 0.46). Hungary's near-neutral average of 0.04 hides pronounced volatility in fiscal sustainability (standard deviation of 0.75; the highest among the V4).

To summarize, Czechia and Slovakia exhibit relatively healthier fiscal sustainability, with Slovakia demonstrating the most consistent approach. In contrast, Poland's metrics lean towards fiscal imbalance. Hungary, while hovering around neutrality, exhibits the most significant variability, indicating potential challenges or pronounced fiscal adjustments across the years.

Table 3 presents the initial condition of the Ponzi-like behaviors of LGUs in the V4. The values provided are particularly insightful as they gauge the fiscal path's sustainability at the local government level. Specifically, positive figures suggest that the sum of discounted primary net lending/borrowing values for the local government sector exceeds zero, indicating the potential for that particular country to embark on a sustainable fiscal path. This analysis examined whether local government sectors in these nations could begin repaying their existing debt.

Table 3. Outcomes for the initial condition of the Ponzi-like behaviors of the local government sector in the V4 economies

	EUR	
	million	EUR per capita
Czechia	5,540.13	524.63
Hungary	814.90	83.00
Poland	– 4,491.73	– 118.36
Slovakia	788.40	145.22

Source: own calculations based on Eurostat n.d.

In terms of the initial condition of the Ponzi-like behaviors of the local government sector, Czechia and Hungary exhibit positive values, implying that their local government sectors are on a potentially sustainable fiscal path. Czechia reached a value of 5.54 bn EUR (and 524.63 EUR per capita), whereas Hungary's figures stand at 0.81 bn EUR (and 83.00 EUR per capita), respectively. Conversely, Poland's negative values (–4.49 bn EUR and –118.36 EUR per capita) suggest potential challenges in achieving fiscal sustainability at the local level. Slovakia, with a modest positive of 0.79 bn EUR (and 145.22 EUR per capita), seems to be in a relatively stable position.

In summary, while Czechia, Hungary, and Slovakia show promising figures suggesting potentially sustainable fiscal paths at the local government level, Poland's data raise concerns regarding its achieving similar sustainability.

Table 4 presents the final condition of the fiscal (un)sustainability scheme (Ponzi-like behaviors) for local government sectors within the V4. An assessment of long-term fiscal sustainability hinges on the values displayed, with positive figures indicating a sum of discounted primary net lending/borrowing values that exceed the initial debt volume. Essentially, these values determine whether a country's local government sector can be deemed fiscally sustainable over the long term.

Table 4. Final condition of the Ponzi-like behaviors of the local government sector in the V4 economies

	EUR	
	million	EUR per capita
Czechia	4,526.55	428.65
Hungary	451.80	46.02
Poland	– 6,179.23	– 162.83
Slovakia	495.35	91.24

Source: own calculations based on Eurostat n.d.

Czechia and Hungary appear to be on a fiscally sustainable path. Czechia's figures are robust, with a total of 4.53 bn EUR (and 428.65 EUR per capita). Hungary, meanwhile, stands at 0.45 bn EUR (and 46.02 EUR per capita). In contrast, Poland's values (–6.18 bn EUR and –162.83 EUR per capita) raise concerns about the long-term fiscal sustainability of its local

government sector. Slovakia, while showing modest figures, also leans toward the positive side, with values of 0.50 bn EUR (and 91.24 EUR per capita).

In essence, while Czechia, Hungary, and Slovakia exhibit data suggesting potential long-term fiscal sustainability for their local government sectors, Poland's indicators are more cautionary, hinting at potential fiscal challenges in the long term.

Conclusion

The empirical findings reveal varying levels of fiscal sustainability among the V4 nations. Czechia and Slovakia consistently demonstrated fiscal resilience, maintaining positive averages and exhibiting potential for sustainable fiscal pathways in both the short and long term. Hungary's variability in its fiscal sustainability metrics indicates the possibility of fiscal adjustments or challenges over the years. Poland's indicators are the most concerning, pointing towards fiscal imbalances and potential long-term unsustainability.

The results directly address the research objectives, which aimed to evaluate whether LGUs in the V4 engage in Ponzi-like public debt practices, assess the impact of economic disruptions like the COVID-19 pandemic and the war in Ukraine on fiscal sustainability, and investigate the role of primary budget balances in stabilizing debt levels. By focusing on the research hypotheses, the study provides a structured understanding of the fiscal dynamics across the V4, grounding its conclusions in empirical evidence.

The added value of this research lies in its application of a comprehensive methodological framework for assessing both short-term and long-term fiscal sustainability. Utilizing the primary gap indicator and Ponzi games criteria, the study provides a framework for evaluating fiscal sustainability at the local government level – a critical aspect of public finance. By offering a comparative analysis of the V4, it provides actionable insights for policymakers and enriches the ongoing debate on fiscal management in transitional economies.

The literature review indicated an academic consensus against the perpetuation of Ponzi schemes and emphasized genuine fiscal sustainability. The primary gap indicator, a measure of short-term fiscal stability, and the conditions of the Ponzi games involvement, which gauged long-term sustainability, provided essential frameworks for the empirical evaluation. The review also highlighted the significance of public trust and the need for authorities to actively seek and uphold fiscal sustainability.

Given the pivotal role that LGUs play in public borrowing and the current fiscal trajectory of the V4 nations, several policy implications emerge:

1. Emphasis on fiscal resilience: countries displaying fiscal resilience, such as Czechia and Slovakia, should continue to uphold and strengthen their fiscal policies, ensuring that they remain adaptable to future economic uncertainties.
2. Addressing variability: Hungary's pronounced variability signals the need for a more stable fiscal policy approach, potentially involving recalibrations or adjustments to address the fiscal challenges or fluctuations observed.

3. Intervention for fiscal imbalance: Poland's indicators, which lean towards fiscal imbalances, require immediate policy interventions. The country must reassess its fiscal strategies at the local government level to correct course and move towards a more sustainable path.

4. Reinforcing public trust: all V4 countries should prioritize maintaining and enhancing public trust, ensuring transparent communication regarding fiscal policies, and taking actions that affirm their commitment to fiscal sustainability.

In conclusion, this study underscores the multifaceted nature of fiscal sustainability across the V4 nations, emphasizing the need for tailored policy interventions and a unified commitment to achieving long-term fiscal stability.

References

Adam, A. (2015), *Approaches of public finance sustainability taking into account the current economic context*, "Financial Studies", 19 (1), pp. 91–101.

Afonso, A., Jalles, J.T. (2016), *The elusive character of fiscal sustainability*, "Applied Economics", 48 (28), pp. 2651–2664, https://doi.org/10.1080/00036846.2015.1128074

Baglioni, A., Cherubini, U. (1993), *Intertemporal budget constraint and public debt sustainability: the case of Italy*, "Applied Economics", 25 (2), pp. 275–283, https://doi.org/10.1080/00036849300000033

Barnhill Jr., T.M., Kopits, G. (1998), *Assessing fiscal sustainability under uncertainty*, "Journal of Risk", 6 (4), pp. 31–53, https://doi.org/10.21314/JOR.2004.096

Barro, R.J. (1989), *The Ricardian Approach to Budget Deficits*, "Journal of Economic Perspectives", 3 (2), pp. 37–54, https://doi.org/10.1257/jep.3.2.37

Blanchard, O.J. (1990), *Suggestions of a new set of fiscal indicators*, "OECD Working Papers", 79.

Bohn, H. (1995), *The Sustainability of Budget Deficits in a Stochastic Economy*, "Journal of Money, Credit, and Banking", 27 (1), pp. 257–271, https://doi.org/10.2307/2077862

Bohn, H. (2007), *Are stationarity and cointegration restrictions really necessary for the intertemporal budget constraint?*, "Journal of Monetary Economics", 54 (7), pp. 1837–1847, https://doi.org/10.1016/j.jmoneco.2006.12.012

Burnside, C. (ed.) (2005), *Fiscal sustainability in theory and practice. A handbook*, The World Bank, Washington, http://documents.worldbank.org/curated/en/982251468160776282 (accessed: 17.04.2024).

Chalk, N., Hemming, R. (2000), *Assessing Fiscal Sustainability in Theory and Practice*, "IMF Working Papers", 081, https://doi.org/10.5089/9781451850352.001

Chen, P.-F. (2016), *U.S. Fiscal Sustainability and the Causality Relationship between Government Expenditures and Revenues: A New Approach Based on Quantile Cointegration*, "Fiscal Studies", 37 (2), pp. 301–320, https://doi.org/10.1111/j.1475-5890.2015.12053

Collard, F., Habib, M., Rochet, J.-C. (2015), *Sovereign Debt Sustainability in Advanced Economies*, "Journal of the European Economic Association", 13 (3), pp. 381–420, https://doi.org/10.1111/jeea.12135

Crosby, A., Robbins, D. (2013), *Mission impossible: monitoring municipal fiscal sustainability and stress in Michigan*, "Journal of Public Budgeting, Accounting and Financial Management", 25 (3), pp. 522–555.

DeJong, D.N., Nankveris, J.C., Savin, N.E., Whiteman, C.H. (1992), *The power problem of unit root tests in time series with autoregressive errors*, "Journal of Econometrics", 53 (1–3), pp. 323–343, https://doi.org/10.1016/0304-4076(92)90090-E

Dombi, Á., Dedák, I. (2019), *Public debt and economic growth: what do neoclassical growth models teach us?*, "Applied Economics", 51 (29), pp. 3104–3121, https://doi.org/10.1080/00036846.2018.1508869

Elliott, G., Rothenberg, T., Stock, J. (1996), *Efficient Tests for an Autoregressive Unit Root*, "Econometrica", 64 (4), pp. 813–836, https://doi.org/10.2307/2171846

Eurostat (2017), *Structure of government debt*, http://ec.europa.eu/eurostat/statistics-explained/index.php/Structure_of_government_debt (accessed: 17.04.2024).

Eurostat (2024), *Government deficit/surplus, debt and associated data, GOV_10DD_EDPT1*, https://ec.europa.eu/eurostat/databrowser/view/gov_10dd_edpt1/default/table?lang=en (accessed: 26.04.2024).

Eurostat (n.d.), *Database: National accounts (ESA 2010)*, https://ec.europa.eu/eurostat/databrowser/explore/all/economy?lang=en&subtheme=na10.namq_10&display=list&sort=category (accessed: 26.04.2024).

Ewing, B.T., Payne, J.E., Thompson, M.A., Al-Zoubi, O.M. (2006), *Government Expenditures and Revenues: Evidence from Asymmetric Modeling*, "Southern Economic Journal", 73 (1), pp. 190–200, https://doi.org/10.2307/20111882

Fan, J., Arghyrou, M.G. (2013), *U.K. Fiscal Policy Sustainability, 1955–2006*, "The Manchester School", 81 (6), pp. 961–991, https://doi.org/10.1111/j.1467-9957.2012.02319.x

Fengze, Y. (2023), *Measurement and Analysis of the Stability of Local Fiscal Revenue*, "International Journal of Advanced Engineering, Management and Science", 9 (1), pp. 9–20, https://doi.org/10.22161/ijaems.91.2

Filipiak, B.Z., Wyszkowska, D. (2022), *Stabilność fiskalna w krajach UE*, "Wiadomości Statystyczne. The Polish Statistician", 67 (8), pp. 17–40, https://doi.org/10.5604/01.3001.0015.9703

Franek, S. (2022), *Konsekwencje kryzysu COVID-19 dla finansów jednostek samorządu terytorialnego w krajach UE*, "Optimum. Economic Studies", 3 (109), pp. 55–68, https://doi.org/10.15290/oes.2022.03.109.05

Gevorkyan, A.V. (2012), *Fiscal policy in select transition economies: opportunities for sustainable development*, "International Journal of Society Systems Science", 4 (1), pp. 55–75, https://doi.org/10.1504/IJSSS.2012.045373

Grosu, A.C., Pintilescu, C., Zugravu, B. (2022), *Trends in public debt sustainability in Central and Eastern EU countries*, "Post-Communist Economies", 34 (2), pp. 173–195, https://doi.org/10.1080/14631377.2020.1867431

Hajdenberg, A., Romeu, R. (2010), *Parameter Estimate Uncertainty in Probabilistic Debt Sustainability Analysis*, "IMF Staff Papers", 57 (1), pp. 61–82, https://doi.org/10.1057/imfsp.2009.25

Hamilton, J.D., Flavin, M.A. (1986), *On the limitations of government borrowing: A framework for empirical testing*, "The American Economic Review", 76 (4), pp. 808–819.

Holmes, M.J., Otero, J., Panagiotidis, T. (2010), *Are EU budget deficits stationary?*, "Empirical Economics", 38 (3), pp. 767–778, https://doi.org/10.1007/s00181-009-0289-3

Ji, H., Ahn, J., Chapman, J. (2016), *The role of intergovernmental aid in defining fiscal sustainability at the sub-national level*, "Urban Studies", 53 (14), https://doi.org/10.1177/0042098015601600

John, J., Kurian, N.J. (2009), *Sub-national fiscal sustainability in a globalised setting*, Cambridge Scholars Publishing, Cambridge.

Kálmán, J. (2023), *The Concept of Financial Stability in Theory and Law*, "Financial and Economic Review", 22 (2), pp. 54–76, https://ssrn.com/abstract=4495009 (accessed: 26.04.2024).

Krajewski, P., Mackiewicz, M., Szymańska, A. (2016), *Fiscal Sustainability in Central and Eastern European Countries – a Post-Crisis Assessment*, "Prague Economic Papers", 25 (2), pp. 175–188, https://doi.org/10.18267/j.pep.553

Kremers, J.J.M. (1989), *U.S. Federal indebtedness and the conduct of fiscal policy*, "Journal of Monetary Economics", 23 (2), pp. 219–238, https://doi.org/10.1016/0304-3932(89)90049-4

Legrenzi, G., Milas, C. (2012), *Nonlinearities and the sustainability of the government's intertemporal budget constraint*, "Economic Inquiry", 50 (4), pp. 988–999, https://doi.org/10.1111/j.1465-7295.2011.00402.x

Maličká, L. (2016), *Searching for fiscal decentralization constraining effect on local expenditure: case of Visegrad countries*, "Scientific Papers of the University of Pardubice. Series D. Faculty of Economics and Administration", 23 (38), pp. 68–80.

Martins-da-Rocha, V.-F., Vailakis, Y. (2012), *On Ponzi schemes in infinite horizon collateralized economies with default penalties*, "Annals of Finance", 8 (4), pp. 455–488, https://doi.org/10.1007/s10436-012-0209-y

Mataibayeva, G., Makysh, S., Kuchukova, N., Zhalbinova, S., Zhussupova, A. (2019), *Conceptual approaches to the public debt management and its impact on financial stability*, "Entrepreneurship and Sustainability Issues", 7 (2), pp, 1496–1513, https://doi.org/10.9770/jesi.2019.7.2(49)

McCallum, B.T. (1992), *Are Bond-financed Deficits Inflationary?: A Ricardian Analysis*, "Journal of Political Economy", 92 (1), pp. 123–135, https://doi.org/10.1086/261211

Minea, A., Villieu, P. (2010), *Endogenous growth, government debt and budgetary regimes: A corrigendum*, "Journal of Macroeconomics", 32 (2), pp. 363–384, https://doi.org/10.1016/S0164-0704(00)00136-1

Misztal, P. (2021), *Public debt and economic growth in the European Union: Empirical investigation*, "WSEAS Transactions on Business and Economics", 18, 21, https://doi.org/10.37394/23207.2021.18.21

Molendowski, E., Stanek, P. (2012), *Globalny kryzys finansowo-gospodarczy i strefy euro a sytuacja fiskalna nowych państw członkowskich (UE-10)*, „Acta Universitatis Lodziensis. Folia Oeconomica", 273, pp. 267–284, http://hdl.handle.net/11089/2116 (accessed: 26.04.2024).

Moździerz, A. (2015), *Strengthening the Post-crisis Fiscal Rules – the Case of Spain, Slovakia and Sweden*, "Equilibrium. Quarterly Journal of Economics and Economic Policy", 10 (2), pp. 31–52, https://cejsh.icm.edu.pl/cejsh/element/bwmeta1.element.desklight-a62a229e-27c3-4f9a-97c2-f9346347d497 (accessed: 26.04.2024).

Nam, C.W., Parsche, R. (2001), *Municipal Finance in Poland, the Slovak Republic, the Czech Republic and Hungary: Institutional Framework and Recent Development*, "MOST: Economic Policy in Transitional Economies", 11 (2), https://doi.org/10.2139/ssrn.268976

Neck, R., Sturm, J.-E. (2008), *Sustainability of Public Debt*, MIT Press, Cambridge, https://doi.org/10.7551/mitpress/9780262140980.001.0001

O'Connell, S.A., Zeldes, S.P. (1988), *Rational Ponzi Games*, "International Economic Review", 29 (3), pp. 431–450, https://doi.org/10.2307/2526789

Okubo, D. (2010), *Fiscal sustainability and local government*, "National Civic Review", 99 (4), pp. 34–39, https://doi.org/10.1002/ncr.20035

Owusu, B. (2021), *Fiscal Sustainability Hypothesis Test in Central and Eastern Europe: A Panel Data Perspective*, "Central European Economic Journal", 8 (55), pp. 285–312, https://doi.org/10.2478/ceej-2021-0021

Palatiello, B., Pilkington, P. (2022), *Government Deficits and Interest Rates: A Keynesian View*, "Working Paper", 183, Institute for New Economic Thinking, https://doi.org/10.36687/inetwp183

Polat, G.E., Polat, O. (2021), *Fiscal sustainability analysis in EU countries: A dynamic macro-panel approach*, "Eastern Journal of European Studies", 12 (1), pp. 219–241, https://doi.org/10.47743/ejes-2021-0109

Potrafke, N., Reischmann, M. (2015), *Fiscal Transfers and Fiscal Sustainability*, "Journal of Money, Credit and Banking", 47 (5), pp. 975–1005, https://doi.org/10.1111/jmcb.12231

Rowley, C.K., Shughart, W.F., Tollison, R.D. (eds.) (2002), *The Economics of Budget Deficits*, Edward Elgar, Cheltenham.

Sávai, M. (2016), *Short-term Fiscal Sustainability of V4 Countries*, "European Financial and Accounting Journal", 11 (3), pp. 169–182, https://doi.org/10.18267/j.efaj.170

Steger, G. (2012), *Redirecting public finance towards a sustainable path*, "OECD Journal on Budgeting", 2, pp. 61–67, https://doi.org/10.1787/budget-12-5k8zsl7n94s8

Szołno-Koguc, J. (2021), *Samodzielność dochodowa jednostek samorządu terytorialnego – aspekty teoretyczne*, "Studia BAS", 1, pp. 9–20, https://doi.org/10.31268/StudiaBAS.2021.02

Tang, Y., Rubio-Cortés, G., Callahan, R., Pisano, M., McGrath, M. (2014), *Key Findings on Fiscal Sustainability for Local Governments in Southern California*, "National Civic Review", 103 (3), pp. 3–13, https://doi.org/10.1002/ncr.21201

Tanner, E., Samake, I. (2008), *Probabilistic Sustainability of Public Debt: A Vector Autoregression Approach for Brazil, Mexico and Turkey*, "IMF Staff Papers", 55 (1), pp. 149–182, https://doi.org/10.1057/palgrave.imfsp.9450029

Trehan, B., Walsh, C.E. (1988), *Common trends, the government's budget constraint, and revenue smoothing*, "Journal of Economic Dynamics and Control", 12 (2/3), pp. 425–444, https://doi.org/10.1016/0165-1889(88)90048-6

Tsuchiya, Y. (2016), *Directional analysis of fiscal sustainability: Revisiting Domar's debt sustainability condition*, "International Review of Economics and Finance", 41, pp. 189–201, https://doi.org/10.1016/j.iref.2015.08.012

Uryszek, T. (2015), *Long-term Sustainability of Public Finance in the Central and Eastern EU Member States*, "Comparative Economic Research. Central and Eastern Europe", 18 (4), pp. 47–61, https://doi.org/10.1515/cer-2015-0028

Uryszek, T. (2019), *Can Fiscal Paths Be Sustainable? Evidence from Poland*, "Emerging Markets Finance and Trade", 57 (13), pp. 3634–3648, https://doi.org/10.1080/1540496X.2019.1668768

Westerlund, J., Prohl, S. (2010), *Panel cointegration tests of the sustainability hypothesis in rich OECD countries*, "Applied Economics', 42 (11), pp. 1355–1364, https://doi.org/10.1080/00036840701721323

Wigger, B.U. (2009), *A note on public debt, tax-exempt bonds, and Ponzi games*, "Journal of Macroeconomics", 31 (3), pp. 492–499, https://doi.org/10.1016/j.jmacro.2008.07.003

Wójtowicz, K. (2015), *System planowania przestrzennego a stabilność fiskalna polskich gmin*, "Prace Naukowe Uniwersytetu Ekonomicznego we Wroclawiu", 404, pp. 311–327, https://doi.org/10.15611/pn.2015.404.21

Wójtowicz, K. (2016), *Prognozowanie skutków finansowych miejscowych planów zagospodarowania przestrzennego a problem zapewnienia stabilności fiskalnej gmin w Polsc*, "Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu", 432, https://doi.org/10.15611/pn.2016.432.18

Wojtowicz, K., Hodzic, S. (2021), *Relationship between fiscal sustainability and efficiency: Evidence from large cities in Poland*, "Economics and Sociology", 14 (3), pp. 163–184, https://doi.org/10.14254/2071-789X.2021/14-3/9

(Nie)zrównoważenie fiskalne w praktyce: finanse samorządowe w gospodarkach Grupy Wyszehradzkiej

Celem artykułu jest ocena stabilności fiskalnej jednostek samorządu terytorialnego (JST) w gospodarkach Grupy Wyszehradzkiej (krajach V4) z uwzględnieniem trzech kluczowych hipotez: (1) JST w krajach V4 realizują tzw. gry/schematy Ponziego; (2) negatywne skutki korzystania z tego schematu nasiliły się w czasie recesji gospodarczej, kryzysu COVID-19 i wojny w Ukrainie; (3) poziomy pierwotnego salda budżetowego JST wpływają na stabilizację poziomów ich zadłużenia. Badanie obejmuje lata 2001–2022, uwzględniając najważniejsze zakłócenia w gospodarce. Do analiz wykorzystano metody oceny stabilności fiskalnej, w tym wskaźnik luki pierwotnej i kryteria realizacji schematu Ponziego. Kluczowe wyniki ujawniają zróżnicowany poziom stabilności fiskalnej w Czechach, na Węgrzech, w Polsce i na Słowacji, z zauważalnymi różnicami w odporności fiskalnej i zarządzaniu długiem. Implikuje to konieczność wzmocnienia dyscypliny budżetowej, korekt prowadzonej polityki oraz przejrzystych ram zarządzania publicznego w celu zaradzenia zidentyfikowanym słabościom. Artykuł stanowi kompleksową analizę stabilności fiskalnej JST w krajach Europy Środkowej, oferując istotne wnioski dla decydentów politycznych i wzbogacając dyskusję na temat zarządzania finansami publicznymi w gospodarkach po transformacji.

Słowa kluczowe: zrównoważenie fiskalne, gospodarki Grupy Wyszehradzkiej, jednostki samorządu terytorialnego, dług publiczny, deficyt budżetowy, gry/schematy Ponziego