DOI: 10.17573/cepar.2026.1.06 *1.01 Original research article*

Economic Determinants of Local Budget Credibility in Slovenia and Croatia

Simona Prijaković
Institute of Public Finance, Croatia
simona.prijakovic@ijf.hr
https.//orcid.org/0000-0001-7835-582X

Vita Jagrič
University of Maribor, Faculty of Economics and Business, Slovenia
vita.jagric@um.si
https://orcid.org/0000-0003-3986-6453

Tanja Markovič Hribernik
University of Maribor, Faculty of Economics and Business, Slovenia
tanja.markovic@um.si
https://orcid.org/0009-0002-4445-6678

Received: 5. 5. 2025
Revised: 12. 9. 2025
Accepted: 3. 11. 2025
Published: 20. 5. 2026

ABSTRACT

Purpose: This article examines the budget credibility of local governments (LGs) in two neighbouring EU countries, Slovenia and Croatia. It analyses eight economic determinants of budget deviations (BDs), defined as the difference between planned and actual budget revenues and expenditures, expressed as a proportion of planned amounts. In doing so, the study addresses an important gap in the literature by providing the first systematic empirical assessment of the economic factors shaping local budget credibility in Central and Eastern Europe, with implications for both fiscal policy and local public finance.

Methodology: The analysis is based on a dynamic panel data model estimated using the system GMM approach and covers all 768 LGs in Slovenia and Croatia over the period 2016–2023. The sample comprises 128 cities and 428 municipalities in Croatia, and 12 cities and 200 municipalities in Slovenia. The empirical framework also incorporates local electoral cycles, including one election prior to and two elections during the observation period in both countries, in order to capture more fully the interaction between political and economic influences on local budgeting practices.

Findings: The findings indicate that Croatian LGs display significantly greater BDs than Slovenian LGs. They also show that current BDs are strongly shaped by their lagged values, pointing to a high degree of persistence in budget credibility outcomes. In Croatia, larger population size is associated with lower BDs in total revenues and capital expenditures. In Slovenia, lower BDs are linked to lower unemployment, higher own-source revenues, and greater reliance on government or EU grants. Overall, the results point to meaningful cross-country differences in the way socio-economic and fiscal factors affect local budget credibility, highlighting the need for context-sensitive approaches to fiscal management.

Originality: This study makes an original contribution to the literature by combining comprehensive coverage of local governments with advanced econometric analysis to identify the economic determinants of local budget credibility. It also provides a basis for the development of harmonised tools for assessing budget credibility, with practical relevance for improving fiscal transparency, accountability, and sustainable local governance across EU countries. The findings may assist policymakers and fiscal managers in strengthening budget planning and execution, thereby contributing to more effective public service delivery and greater financial stability.

Keywords: budget credibility, Croatia, economic determinants, local governments, Slovenia, system GMM

Ekonomske determinante verodostojnosti lokalnih proračunov v Sloveniji in na Hrvaškem

POVZETEK

Namen: članek obravnava verodostojnost proračunov lokalnih samouprav v dveh sosednjih državah članicah EU – Sloveniji in Hrvaški. Analizira osem ekonomskih determinant proračunskih odstopanj, opredeljenih kot razlika med načrtovanimi in dejanskimi proračunskimi prihodki ter odhodki, izražena kot delež načrtovanih zneskov. Študija s tem zapolnjuje pomembno vrzel v literaturi, saj prinaša prvo sistematično empirično presojo ekonomskih dejavnikov, ki oblikujejo verodostojnost lokalnih proračunov v Srednji in Vzhodni Evropi, ter ponuja pomembna izhodišča za fiskalno politiko in lokalne javne finance.

Metodologija: analiza temelji na dinamičnem panelnem modelu, ocenjenem s sistemskim GMM, in zajema vseh 768 lokalnih samouprav v Sloveniji in na Hrvaškem v obdobju 2016–2023. Vzorec vključuje 128 mest in 428 občin na Hrvaškem ter 12 mestnih občin in 200 občin v Sloveniji. Empirični okvir upošteva tudi lokalne volilne cikle, in sicer ene volitve pred opazovanim obdobjem in dvoje volitev med njim v obeh državah, da bi čim celoviteje zajel preplet političnih in ekonomskih vplivov na lokalne proračunske prakse.

Ugotovitve: rezultati kažejo, da so proračunska odstopanja pri hrvaških lokalnih samoupravah statistično značilno večja kot pri slovenskih. Hkrati kažejo, da na tekoča proračunska odstopanja pretežno vplivajo njihove odložene vrednosti, kar kaže na visoko stopnjo vztrajnosti verodostojnosti proračunov. Na Hrvaškem je večje število prebivalcev povezano z nižjimi proračunskimi odstopanji pri skupnih prihodkih in kapitalskih od-

hodkih. V Sloveniji pa so nižja proračunska odstopanja povezana z nižjo stopnjo brezposelnosti, višjimi lastnimi prihodki ter večjo odvisnostjo od državnih ali evropskih dotacij. Rezultati tako kažejo na pomembne meddržavne razlike v vplivu socialno-ekonomskih in fiskalnih dejavnikov na verodostojnost lokalnih proračunov ter poudarjajo potrebo po kontekstno prilagojenih pristopih k fiskalnemu upravljanju.

Izvirnost: študija izvirno prispeva k literaturi, saj združuje celovit zajem lokalnih samouprav z napredno ekonometrično analizo za prepoznavanje ekonomskih determinant verodostojnosti lokalnih proračunov. Hkrati vzpostavlja podlago za razvoj harmoniziranih orodij za ocenjevanje verodostojnosti proračunov, ki so praktično pomembna za krepitev fiskalne transparentnosti, odgovornosti in trajnostnega lokalnega upravljanja v državah EU. Ugotovitve lahko oblikovalcem politik in nosilcem fiskalnega upravljanja pomagajo pri izboljšanju proračunskega načrtovanja in izvrševanja ter s tem prispevajo k učinkovitejšemu zagotavljanju javnih storitev in večji finančni stabilnosti.

Ključne besede: verodostojnost proračuna, Hrvaška, ekonomske determinante, lokalne samouprave, Slovenija, sistemski GMM

JEL: H111, H72

1 Introduction

Budget credibility refers to the accuracy of planned revenues and expenditures approved by governments in their enacted budgets, compared to the actual or executed revenues and expenditures as reported in their year-end reports. According to PEFA (2018), the difference in revenue between the originally approved budget and the year-end result is measured by revenue deviation. Accurate revenue estimates are a crucial input in a credible budget as they enable the provision of public goods and services and funding of expenditures. Unreasonably high expenditure allocations brought on by too optimistic revenue estimates may eventually necessitate an unanticipated rise in borrowing or a possibly disruptive in-year spending cut in order to maintain the planned expenditure level. If budgets are not implemented as intended, this directly impacts when and how essential public services are delivered and can undermine progress in addressing poverty and inequality (IBP, 2024).

However, if the prediction is overly pessimistic, the money derived from an overestimation of revenue may be utilised for spending that has not been planned during the budget process. The parameters used to rate this indication allow for somewhat greater freedom when evaluating an over-realisation because the repercussions of revenue under-realisation may be more severe, particularly in the short term. When actual expenditures deviate from the approved, they are either underspent (if spending is less than what was allocated) or overspent (if spending is greater). Civil society plays a key role in monitoring budget deviations (BDs) and ensuring government accountability for budget execution (IBP, no date). International Budget Partnership (IBP), since 2018, has investigated the extent, origins, rationales, and effects of dif-

ferences between executed and planned budgets at the national and local government (LG) levels. Deviations of up to 5% are permissible because it is challenging to accomplish the precise budget outturns as initially envisaged (PEFA, 2019). Deviations are unavoidable, but each must be sufficiently explained in the budget execution documentation. When releasing their mid-year and year-end reports, governments need to provide thorough justifications for any BDs, along with information on how they intend to address the issue moving forward and what is likely to occur to any planned revenues and expenditures not executed in subsequent budget periods.

From a public administration viewpoint, budget credibility reflects the institutional capacity of LGs to effectively plan, implement, and manage public resources within a framework of fiscal transparency and accountability. It not only influences economic outcomes but also underpins governance quality by fostering citizens' trust and enhancing institutional legitimacy through reliable service delivery (Moynihan, 2008). Accountability mechanisms and civil society participation are crucial for monitoring BD and ensuring government responsiveness, reinforcing democratic governance and fiscal discipline at the local level (Fung, 2015; Bovens, 2007). The study situates these issues within interdisciplinary theoretical frameworks such as principal-agent theory, fiscal illusion theory, and public choice theory, which explain the incentives and organisational factors shaping budget outcomes (Przeworski et al., 2012). Finally, in the context of the European Union, efforts to improve budget credibility align with broader governance objectives aimed at promoting fiscal discipline, transparency, and good governance across member states' LGs, ensuring the efficient and equitable use of public funds (European Commission, 2020).

The question of how variations in economic and political contexts impact the accuracy of budget forecasting has recently been the focus of some research at LG levels (Bohn and Veiga, 2021; Boukari and Veiga, 2018; Cuadrado-Ballesteros et al., 2022; Jorge et al., 2023; Lee and Kwak, 2020; Ríos et al., 2018; Rullán and Villalonga, 2018; Siregar and Susanti, 2019). Our research contributes to the literature because it examines eight economic determinants of budget credibility at the local level in two neighbouring EU countries – Croatia and Slovenia. A dynamic panel model (system-GMM) was applied to 768 cities, urban municipalities, and municipalities in the period 2016-2023, in which local elections were held twice in each of these countries – in Slovenia in 2018 and 2022 and in Croatia in 2017 and 2021. There have been two similar investigations, the first by Boukari and Veiga (2018) examined political and institutional determinants for 308 Portuguese LGs and 95 French departments during 2004-2015, and 1998–2015, respectively. The second by Benito et al. (2015), examined political and economic determinants for 2,644 Spanish LGs during 2002-2010.

The second section presents the theories and development of hypotheses for the economic determinants of budget credibility, the third presents methodology and data, the fourth gives results, and the fifth concludes with observations and suggestions for future research.

2 Literature Review

There are several theoretical approaches to understanding budget credibility, which emphasise the complex relationships between economic, political, and institutional factors.

The principal-agent problem explains budget credibility gaps as a result of asymmetry of information between principals (voters) and agents (politicians). Politicians, typically possessing greater information and discretionary authority than voters, may pursue interests that do not optimise voter welfare (Miller and Whitford, 2007). This behaviour can lead to opportunism during the design and implementation of public budgets, as politicians may manipulate forecasts to serve electoral or personal interests (Bohn and Veiga, 2021). However, establishing theoretical frameworks and administrative reforms alone is insufficient, highlighting the need to identify economic and institutional factors affecting BDs. Zimmerman (1977) explains that incumbent politicians' primary motivations include re-election, career advancement, and increased earnings, which can influence budget forecast credibility.

Fiscal illusion theory posits that voters tend to overestimate the benefits and underestimate the full cost of public spending, creating opportunities for politicians to obscure fiscal realities (Buchanan and Wagner, 1977; Benito and Bastida, 2009). Such illusions arise from asymmetries in information and contribute to persistent inaccuracies in budget reports. From a public administration perspective, transparency and participatory governance are key to reducing fiscal illusions and improving budget credibility (Miller, 2005; Christensen and Cheney, 2015; Sarr, 2015).

According to public choice theory, politicians systematically overestimate revenues and underestimate expenditures to gain public favour, often linked to political party ideology (Musgrave and Musgrave, 1989; Hibbs, 1977). Budget managers operate within institutional structures consisting of formal and informal budgetary process rules (Wildavsky, 1961; Dabla-Norris et al., 2010). Institutional theory adds that organisational norms and pressures, including party discipline and isomorphic forces, influence budgetary decisions (DiMaggio and Powell, 1983).

Alesina and Passalacqua (2016) identify strategic practices by politicians such as inflating projected economic growth, understating expenditures, and manipulating budget baselines to create fiscal illusions, misleading voters and delaying necessary fiscal adjustments. These activities complicate accountability mechanisms and undermine fiscal discipline.

The literature increasingly highlights the crucial role of institutional quality, fiscal accountability, and transparency in shaping budget credibility (Wehner, 2013; Alt et al., 2006). Transparent budget processes reduce information asymmetry and strengthen government accountability, positively influencing budget accuracy and public trust (Sarr, 2015; Miller, 2005). Political competition, democratic governance, and institutional checks are core determinants

of transparency and fiscal discipline at the LG levels (Alt et al., 2006; Wehner and de Renzio, 2013).

Our study integrates these economic and institutional theoretical perspectives, linking each economic determinant to its underlying theoretical basis to better explain BDs observed in LGs in Slovenia and Croatia. The following section will develop eight hypotheses and connect them to the previous literature.

2.1 Development of hypotheses

Following the comprehensive literature review, the eight hypotheses are grouped into three thematic groups, reflecting key theoretical perspectives and interrelations between economic determinants and institutional design that affect budget credibility. First, socio-economic and demographic determinants relate to the size and economic characteristics of LGs, impacting institutional capacity and fiscal demands. Second, fiscal capacity and revenue structure deal with the financial structure and fiscal autonomy of LGs, focusing on sources and management of revenues. Finally, third, fiscal dynamics and budgetary discipline address fiscal trends and intertemporal budget management, which affect deviations.

2.1.1 Socio-economic and demographic determinants

A bigger population means higher and more varied needs for essential public goods and services, making forecasting and planning more difficult and eventually leading to higher BDs. The size of the population is one of the determinants of budget credibility since larger LGs could profit from economies of scale as they are expected to collect more tax. The collected revenues are comparatively higher than the budgeted revenues, indicating that LGs with a bigger population have higher shares of tax revenue in total revenues than LGs with smaller populations (Bischoff and Gohout, 2010). LGs with larger populations tend to underestimate tax revenues less (Cuadrado-Ballesteros et al., 2022), are less prone to overestimating their tax revenues (Ríos et al., 2018) and overestimating operating expenditures (Cuadrado-Ballesteros et al., 2022; Ríos et al., 2018). The institutional theory suggests that larger LGs benefit from economies of scale and enhanced administrative capacity, enabling more accurate forecasting and budget management (Bischoff and Gohout, 2010). Hence, bigger LGs tend to have stronger institutional frameworks that reduce BDs. Therefore, the hypothesis is:

H_1: LGs with bigger populations have lower budget deviations.

According to Boylan (2008), States in the United States overestimate tax revenues during periods of high unemployment, demonstrating the critical role that the unemployment rate plays in the accuracy of budgetary planning. In Portuguese and French LGs, a higher unemployment rate is associated with overestimating revenues and expenditures (e.g., Boukari and Veiga, 2018). Furthermore, lower unemployment rates lead to more optimistic forecasts in total/capital/operating revenues in Portuguese LGs (Bohn and Veiga, 2021). Benito et al. (2015) found a decrease in operating expenditure underestima-

tion in Spanish LGs; still, capital expenditures have the reverse influence. Replacement impact exists among operating and capital expenditures. Benito et al. (2015) showed that the impact of unemployment growth on Spanish LGs decreases BD in revenues. According to the principal-agent theory, economic volatility, such as high unemployment, creates opportunities for politicians (agents) to manipulate budget forecasts to their advantage due to asymmetric information with voters (principals) (Miller and Whitford, 2007). This results in greater forecasting errors during periods of elevated unemployment. Therefore, the hypothesis is:

H_2: LGs with higher unemployment rates have higher budget deviations.

Resident income levels influence public demands and the fiscal ability of LGs. According to Giroux and McLelland (2003) and Piotrowski and Van Ryzin (2007), residents with greater income tend to be more demanding regarding additional public services. Guillamón et al. (2024) showed that LGs with higher residents' income overestimate operating expenditures less; however, Cuadrado-Ballesteros et al. (2022) showed that LGs with greater residents' income were prone to overestimate operating expenditures more and underestimate tax revenues less, leading to a good financial position (Cuadrado-Ballesteros et al., 2022). On the contrary, Benito et al. (2015) and Ríos et al. (2018) showed that LGs with higher residents' income tend to overestimate tax revenue less, which shows that they are not attempting to manipulate the budget to increase their popularity. Public administration perspectives emphasise that residents with higher incomes exert greater demands for transparency and accountability, which improves budget credibility (Fung, 2015). Additionally, higher fiscal capacity associated with affluent residents supports more reliable budget planning aligned with institutional norms. Therefore, the hypothesis is:

H_3: LGs with a greater resident income have lower budget deviations.

2.1.2 Fiscal capacity and revenue structure

Boukari and Veiga (2018) found that a larger dependence on local direct taxes in French departments causes a tendency toward conservative budget forecasting. Korean LGs with greater economic independence (higher share of their own revenues) are seemingly less likely to manipulate revenues (Lee and Kwak, 2020). In Croatian LGs, where the share of own revenues is higher, the overestimation of operating revenues is lower (Guillamón et al., 2024). By contrast, Jorge et al. (2023) showed that a Portuguese LG's tendency to overestimate revenues increased with its financial independence. Greater reliance on own revenues reflects stronger fiscal autonomy and accountability, which, according to institutional autonomy theory, reduces opportunities for opportunistic budget manipulation (Boukari and Veiga, 2018; Lee and Kwak, 2020). This autonomy supports enhanced budget planning capacity and conservative forecasting behaviour. Therefore, the hypothesis is:

H_4: LGs with a higher share of own revenues in total revenues have lower budget deviations.

Spanish LGs that receive more regional and central government grants tend to underestimate tax revenues and overestimate operating expenditures less (Cuadrado-Ballesteros et al., 2022). Also, Guillamón et al. (2024) showed that they are less prone to overestimating their operating revenues. Intergovernmental fiscal relations suggest that reliance on grants imposes formal constraints and increases oversight, fostering transparency and discipline (Cuadrado-Ballesteros et al., 2022). This institutional framework aids LGs in aligning forecasts more closely to actual revenues and expenditures. Therefore, the hypothesis is:

H_5: LGs with a higher share of grants have lower budget deviations.

If LGs improve their tax administration performance, they obtain a greater proportion of tax revenues (Goeminne et al., 2008). Tax revenue forecasts are underestimated when revenues increase during economic expansion and are overestimated during a period of economic downturn due to failure to predict revenue accurately (Lee and Kwak, 2020). According to Ríos et al. (2018), Spanish LGs with a larger share of tax revenues were more probably to underestimate tax revenues and operating expenditures because they seem more conservative in their revenue projections and eventually overspent because their actual tax revenues exceeded their plan. Effective tax administration and conservative forecasting, emphasised in public choice and institutional theories, underpin fiscal health and budget credibility (Goeminne et al., 2008; Ríos et al., 2018). LGs with larger tax revenue shares tend to adopt prudent revenue projections, reducing deviations. Therefore, the hypothesis is:

H_6: LGs with a higher share of tax revenues in total revenues have lower budget deviations.

2.1.3 Fiscal dynamics and budgetary discipline

Siregar and Susanti (2019) showed that both revenue and expenditure growth lead to a greater overestimation of revenues and expenditures in Indonesian LGs. A relative revenue increase from the previous year means better planning for operating expenditures for schools, child care, roads, older people, and libraries in Danish LGs (Serritzlew, 2005). Rapid changes in fiscal dynamics introduce volatility and complexity to budget planning, challenging the ability of LGs to accurately forecast revenues and expenditures (Siregar and Susanti, 2019; Serritzlew, 2005). This reflects the theory of fiscal volatility and dynamic institutional adaptation, where uncertainty increases the risk of BDs due to constraints in institutional learning and adjustment. Therefore, the hypotheses are:

H_{7A}: LGs with a higher revenue growth have higher budget deviations.
H_{7B}: LGs with a higher expenditure growth have higher budget deviations.

The budget surplus represents the fiscal pressure in budget formulation in the approval stages and could have an impact on BDs (Boukari and Veiga, 2018). These authors showed how an improved budget surplus leads to more conservative revenue and expenditure forecasts. A lower deficit in the prior year results in a smaller prediction of total and capital revenue errors (Bohn

and Veiga, 2021). A favourable financial condition typically results from LGs with a budget surplus, underestimating revenues and overestimating expenditures (Cuadrado-Ballesteros et al., 2022; Guillamón et al., 2024; Ye, 2023). LGs know the budget surplus for the previous year when planning the budget for the next year. The presence of a budget surplus signals favourable fiscal conditions and exerts positive fiscal discipline, supporting more conservative and credible budgeting (Boukari and Veiga, 2018; Bohn and Veiga, 2021). This aligns with theories of fiscal rules and institutional constraints, which posit that sound fiscal management and rules reduce budgeting opportunism and improve forecast accuracy. Therefore, the hypothesis is:

H_8: LGs with a higher budget surplus have lower budget deviations.

3 Methodology and Data

Croatia has 20 counties, 128 cities and 428 municipalities which are all obliged by the Budget Act (2022) and Act on the Right of Access to Information (2022) to publish key budget documents on their websites, among others the enacted budget and the year-end report. The enacted budget includes plans for the following fiscal (calendar) year and projections for two years afterwards. During the year, LGs can revise the budget amounts, i.e. reduce or increase the planned amounts; however, budget revision is not the focus of this paper. The enacted budget must be approved before the beginning of the fiscal year or in special cases, a decision on temporary financing for the first three months has to be made. During this period, LGs must approve the enacted budget for the current year. The year-end report has to be approved after the fiscal year ends. In the explanation of the year-end report, LGs must explain all deviations from the initially planned (enacted budget) and revisions of the budget.

Slovenia has 12 urban municipalities and 200 municipalities. Under the Public Finance Act (1999), LGs must publish key budget documents on their websites, among others, the enacted budget and the year-end report. The enacted budget includes plans for the following fiscal (calendar) year. Usually, LGs approve the budget for the next two years. LGs can revise the budget amounts, i.e. reduce or increase the planned amounts. However, budget revision is not the focus of this paper. The enacted budget must be approved by the beginning of the fiscal year. If this is not the case, a decision on temporary financing for the first three months has to be made. During this period, LGs must approve this fiscal year's enacted budget. Since many Slovenian LGs did not approve the enacted budget before the beginning of the fiscal year, dummy variable timelines (variable takes a value of 1 if the budget is approved before the fiscal year starts and zero otherwise) were initially included but were not significant. The year-end report has to be approved after the fiscal year ends. In the explanation of the year-end report, LGs must explain all deviations from the initially planned (enacted budget) and revisions of the budget.

The LGs' ability to accomplish their revenue and expenditure goals (outlined in the enacted budget) throughout a fiscal year is referred to as budget cred-

ibility (IBP, no date). Thus, the dependent variables are the BDs of revenues and expenditures, calculated by the following formula:

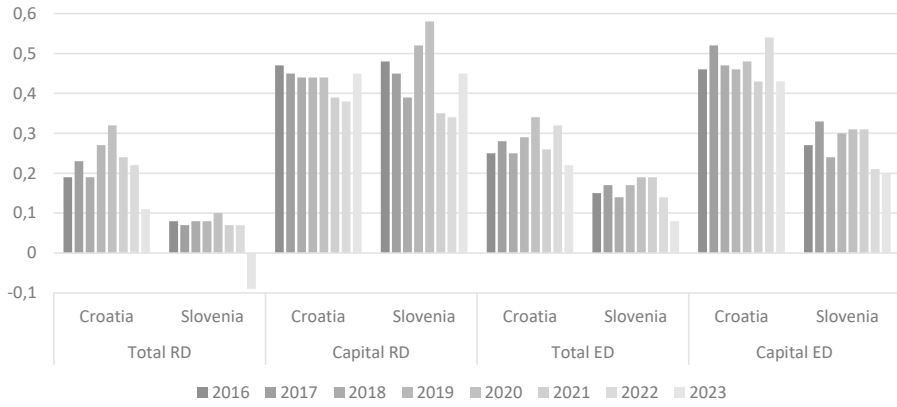
$$budget\ deviation = \frac{planned\ amount - realised\ amount}{planned\ amount},$$

planned amount is the one recorded in the enacted budget, while the realised amount is reported in the year-end report of an LG (Prijaković, 2024; Prijaković, 2025).

Our sample comprises all 768 LGs – in Croatia (128 cities and 428 municipalities) and Slovenia (12 urban municipalities and 200 municipalities). The period is from 2016-2023, thus encompassing 8 years of observations for dependent variables with three local election cycles. Local elections were held in Croatia (May 2013, 2017 and 2021) and Slovenia (October 2014, November 2018 and December 2022).

Except for the capital revenue, Graph 1 shows lower BDs in Slovenian than in Croatian LGs. Capital revenues and expenditures are particularly difficult to plan as they are mostly financed from EU grants. It may be said that total revenues and expenditures are better planned in Slovenia than in Croatia (larger BDs in Croatian than in Slovenian LGs). In Slovenia, it is only total revenues that are underestimated in 2023, and these are more accurately planned.

Graph 1. LG average revenue and expenditure BDs



Source: Authors' calculation.

Independent variables in this study are chosen based on the theoretical perspectives outlined above and supported by previous empirical research to explain what determines BDs. The socio-economic and demographic variables include the size of the LG, measured as the number of inhabitants (population); the unemployment rate, serving as an indicator of the overall economic condition within the LG; and residents' well-being, proxied by residents' income per capita in Croatian LGs and net salary in Slovenian LGs. These variables align with institutional and principal-agent theories by reflecting insti-

tutional capacity, economic volatility, and the socio-economic pressures that shape budgeting behaviour.

The financial variables analysed include the LG's share of own revenues in total revenues, share of tax revenues in total revenues, share of grants in total revenues (proxied by all grants from central government and the EU), budget balance in the previous year, and revenue and expenditure growth, which capture fiscal dynamics from the previous year. Own revenue share reflects fiscal autonomy and institutional independence, which, according to institutional autonomy and accountability theories, support conservative and credible budgeting (Boukari and Veiga, 2018). Grants represent external fiscal oversight shaping budget discipline in a multi-level governance context (Cuadrado-Ballesteros et al., 2022). Tax revenue share signifies tax administration efficiency and political incentives toward prudent revenue projections, rooted in public choice and institutional frameworks (Goeminne et al., 2008). Revenue and expenditure growth capture fiscal volatility and dynamic institutional adaptations consistent with fiscal uncertainty theories (Serritzlew, 2005). Budget balance, especially prior-year surpluses, indicates fiscal discipline imposed by formal rules and constraints, reducing budgetary opportunism (Bohn and Veiga, 2021). Additionally, a dummy variable distinguishes Slovenian (1) from Croatian (0) LGs, controlling for country-specific institutional and political differences, an approach supported by comparative institutional theory. Table 1 provides details and descriptive statistics for all variables used.

Table 1. Definition of variables

Variable	Description	Source
Dependent variables		
Revenue deviation	Calculated as: $revenue\ deviation = \frac{plan - realised}{plan}$, between 2016-2023 and calculated for total and capital revenue deviations.	Realised amounts are from MoF (2024a; 2024b); planned amounts are from enacted budgets on LGs' official websites – authors' collections.
Expenditure deviation	Calculated as: $expenditure\ deviation = \frac{plan - realised}{plan}$, between 2016-2023 and calculated for total and capital expenditure deviations.	

Variable	Description	Source
Independent variables		
Population	Natural logarithm of total number of inhabitants in every LG (population estimates), 2016-2023.	Statistical Office of the Republic of Slovenia (2024) Croatian Bureau of Statistics (2024)
Unemployment rate	The unemployment rate in each LG, 2015-2022, is always for the previous year.	Employment Service of Slovenia (2024) Ministry of Regional Development and EU Funds (2024)
Residents income	Croatia: Natural logarithm of residents' fortune in each LG, calculated as the average monthly residents' income per capita in €. Slovenia: Natural logarithm of residents' fortune in each LG, calculated as the average monthly net salary in €. 2016-2023.	Ministry of Regional Development and EU Funds (2024) Statistical Office of the Republic of Slovenia (2024)
Own revenues	Share of own revenues in total revenues (operating revenues minus grants is how own revenues are determined), 2016-2023.	MoF (2024a) MoF (2024b)
Grants	Share of grants in total revenues for each LG, 2016-2023.	MoF (2024a) MoF (2024b)
Tax revenues	Share of tax revenues in total revenues for each LG, 2016-2023.	MoF (2024a) MoF (2024b)
Revenue growth	For 2016-2023, calculated as: $\frac{total\ revenue_t - total\ revenue_{t-1}}{total\ revenue_{t-1}}$	MoF (2024a) MoF (2024b)
Expenditure growth	For 2016-2023, calculated as: $\frac{total\ expenditure_t - total\ expenditure_{t-1}}{total\ expenditure_{t-1}}$	MoF (2024a) MoF (2024b)

Variable	Description	Source
Budget balance	Calculated as total operating revenues minus total operating expenditures in total operating revenues, 2015-2022, always for the previous year (total operating revenues is calculated as total revenues minus capital revenues).	MoF (2024a) MoF (2024b)

Source: Authors.

The model specifications are as follows:

$$Revenue\ deviation = \beta_0 + \beta_1 Revenue\ deviation_{i,t-1} + \beta_2 population_{it} + \beta_3 unemployment\ rate_{i,t-1} + \beta_4 residence\ income_{it} + \beta_5 own\ revenues_{it} + \beta_6 grants_{it} + \beta_7 tax\ revenues_{it} + \beta_8 revenue\ growth_{it} + \beta_9 budget\ balance_{i,t-1} + \varepsilon_{it},$$

$$Expenditure\ deviation = \beta_0 + \beta_1 Expenditure\ deviation_{i,t-1} + \beta_2 population_{it} + \beta_3 unemployment\ rate_{i,t-1} + \beta_4 residence\ income_{it} + \beta_5 own\ revenues_{it} + \beta_6 grants_{it} + \beta_7 tax\ revenues_{it} + \beta_8 expenditure\ growth_{it} + \beta_9 budget\ balance_{i,t-1} + \varepsilon_{it},$$

$i = 1, \dots, N, t = 1, \dots, T$, where β_0 is a constant term, i indicates LG, t is time, β_j are parameters being approximated ($j = 1,..,9$), and ε_{it} is the error term.

We used a dynamic panel model where BDs are dependent variables, and to capture persistence in BDs included are the lagged dependent variables. We are using a two-step system-GMM technique to calculate the models (Arellano and Bover 1995; Bundell and Bond 1998; Roodman 2009). This technique reduce the endogeneity of the lagged dependent variable when independent variable and error term are correlated.

Figure 1. provides a clear overview of the relationship between planned and actual revenues and expenditures, illustrating how deviations from budget projections signal different planning approaches. When actual revenues or expenditures exceed planned amounts, it indicates underestimation due to either pessimistic or optimistic planning, respectively. Conversely, when actual values fall short of plans, it reflects overestimation rooted in optimistic or pessimistic assumptions. Situations where actual and planned figures are equal demonstrate accurate forecasting and effective budget realisation. Understanding these patterns helps interpret the fiscal discipline and realism of financial planning in public sector budgets, clarifying the impact of forecast biases on budget credibility and execution outcomes.

Figure 1. Overestimation and underestimation of revenues and expenditures

REVENUES	EXPENDITURES
ACTUAL REVENUES > PLANNED REVENUES UNDERESTIMATED REVENUES – PESSIMISTIC PLANNING	ACTUAL EXPENDITURES > PLANNED EXPENDITURES UNDERESTIMATED EXPENDITURES – OPTIMISTIC PLANNING
ACTUAL REVENUES = PLANNED REVENUES COLLECTED REVENUES ARE EQUAL TO PLANNED	ACTUAL EXPENDITURES = PLANNED EXPENDITURES COLLECTED EXPENDITURES ARE EQUAL TO PLANNED
ACTUAL REVENUES < PLANNED REVENUES OVERESTIMATED REVENUE – OPTIMISTIC PLANNING	ACTUAL EXPENDITURES < PLANNED EXPENDITURES OVERESTIMATED EXPENDITURES – PESSIMISTIC PLANNING

Source: Authors.

4 Results and Discussion

Table A1 in the Appendix shows descriptive statistics for all used variables for the whole sample and separately for each country. The samples of Croatian and Slovenian LGs demonstrates the disparities across countries regarding same variables. Except for capital revenues, BDs are higher in Croatian than in Slovenian LGs. Mean value for the variables unemployment rate, grants, revenue and expenditure growth are on average lower in Slovenian than in Croatian LGs. Mean values for the variables' population, own revenues, income, tax revenues and budget balance are on average lower in Croatian than in Slovenian LGs. Correlation between the variables is examined prior to estimating the models used. Table A2 in the Appendix shows the correlation matrix for the whole sample. There are no multicollinearity issues among the variables.

Results from the dynamic panel models using system GMM estimation are presented in Tables 2, 3, and 4. The dynamic model appears appropriate since lagged dependent variables in the models were significant. All dependent variables have a positive and significant relationship with their lagged values. Our results reveal the key economic determinants of BDs in LGs across various samples (all LGs, Slovenian LGs and Croatian LGs), as well as across three periods (2016-2023, 2016-2019, and 2020-2023).

Table 2 presents results for all Slovenian and Croatian LGs over the entire sample period. Lagged variables exhibit a positive and significant effect on all revenue and expenditure deviations, highlighting the persistence of deviations across years. Residents' income, as a measure of economic strength, significantly negatively affects total revenues as well as total and capital expenditures, indicating that LGs with higher residents' incomes experience smaller deviations. Own revenues negatively impact total revenue deviations but have a strong positive effect on capital revenue deviations, suggesting greater flexibility in capital revenue planning among LGs with higher own revenues. Grants have a significant and positive influence on capital revenue deviations, reflecting instability in grant funding. Lastly, tax revenues are positively and significantly associated with total revenue and both total and capital expenditure deviations, implying that in LGs where tax revenues increase, revenue and expenditure deviations tend to be larger.

Table 2. Results of dynamic system-GMM for economic determinants of BDs – all LGs during 2016–2023

	Total RD	Capital RD	Total ED	Capital ED
Total RD lag	**0.42*** (-9.98)**			
Capital RD lag		**0.76*** (-2.89)**		
Total ED lag			**0.66*** (-4.03)**	
Capital ED lag				**0.66*** (-2.93)**
Population	-0.1 (-1.41)	0.04 (-0.15)	-0.09 (-0.94)	-0.02 (-0.10)
Unemployment rate	0 (-0.62)	-0.01 (-1.17)	0 (-0.71)	0 (-0.28)
Residents income	**-0.10*** (-4.59)**	0.07 (-1)	**-0.10*** (-4.51)**	**-0.17*** (-4.22)**
Own revenues	**-1.30* (-1.69)**	**5.29*** (-3.7)**	0.58 (-0.59)	-1.2 (-1.00)
Grants	-0.87 (-1.26)	**4.87*** (-3.91)**	0.48 (-0.56)	-0.82 (-0.83)
Tax revenues	**0.50*** (-2.83)**	-0.88 (-1.50)	**0.37* (-1.75)**	**0.87** (-2.36)**
Revenue growth	**-0.00*** (-5.91)**	0 (-0.97)		
Expenditure growth			**-0.00*** (-5.69)**	**-0.00*** (-5.95)**
Budget balance	0 (-1.28)	0 (-0.78)	0 (-0.68)	0 (-1.22)
Constant	**2.05*** (-3.09)**	**-4.97*** (-3.93)**	0.3 (-0.41)	**1.94** (-2.1)**
Observations	5,376	5,376	5,376	5,376
Number of id	768	768	768	768
AR(1) p-value	0.000	0.000	0.000	0.000
AR(2) p-value	0.302	0.002	0.081	0.048
Sargan p-value	0.000	0.529	0.292	0.43
Hansen p-value	0.000	0.0879	0.186	0.295

Source: Authors' calculation.

*Note: t-statistics are in parentheses. Significance levels: 1%, ***; 5%, **; 10%, *. The mean values of the dependent variables (Total RD, Capital RD, Total ED, and Capital ED) are positive, indicating overestimation (planned values are higher than actual executed values). A positive*

sign indicates greater overestimation (optimistic planning), while a negative sign indicates lower overestimation (actual revenues and expenditures tend to match planned values).

Table 3 presents the results for all Slovenian LGs for the entire period. The lagged variable of total revenue deviations shows a significant positive, though smaller, effect, highlighting the persistence of these deviations over time. In Slovenian LGs, higher population and higher unemployment rates are associated with larger capital expenditure deviations. As previous-year unemployment rises, LGs tend to overestimate capital expenditures, consistent with findings by Boukari and Veiga (2018) and Couture and Imbeau (2009). Similarly, population growth correlates with higher overestimation of capital expenditures, aligning with results from Bohn and Veiga (2021) for Portuguese LGs. Own revenues and grants reduce deviations of total revenues and both total and capital expenditures, likely due to greater control over budget planning and execution, thus mitigating unpredictability. However, capital revenues exhibit a strong positive deviation, reflecting their inherent volatility and planning difficulties. Notably, as own revenues increase, the overestimation of capital revenues rises, as observed by Jorge et al. (2023). Meanwhile, overestimations of total revenues, total expenditures, and capital expenditures generally decline, indicating a better alignment of planned and actual values.

Table 3. Results of dynamic system-GMM for economic determinants of BDs – Slovenian LGs during 2016–2023

	Total RD	Capital RD	Total ED	Capital ED
Total RD lag	**0.22**** **(-2.48)**			
Capital RD lag		0.04 (-1.15)		
Total ED lag			-0.03 (-0.26)	
Capital ED lag				0.03 (-0.39)
Population	0.07 (-0.72)	-0.17 (-0.59)	0.13 (-1.29)	**0.34*** **(-1.83)**
Unemployment rate	0 (-0.13)	-0.01 (-0.49)	0 (-0.53)	**0.03***** **(-2.72)**
Residents income	0.05 (-0.19)	0.17 (-0.21)	0.01 (-0.06)	0.6 (-1.08)
Own revenues	**-2.84*** **(-1.72)**	**7.78**** **(-2.04)**	**-3.28***** **(-3.06)**	**-4.97*** **(-1.80)**
Grants	**-2.14*** **(-1.66)**	**8.66***** **(-3.01)**	**-2.77***** **(-3.07)**	**-4.58**** **(-2.42)**
Tax revenues	0.97 (-1.32)	1.78 (-0.7)	0.93 (-1.34)	1.14 (-0.63)

	Total RD	Capital RD	Total ED	Capital ED
Revenue growth	**-0.00*** (-3.77)**	0 (-1.04)		
Expenditure growth			0 (-0.14)	0 (-0.74)
Budget balance	0 (-1.11)	0 (-0.19)	0 (-0.87)	0 (-0.09)
Constant	1.47 (-0.74)	-9.08 (-1.39)	2.01 (-1.05)	-1.57 (-0.37)
Observations	1,484	1,484	1,484	1,484
Number of id	212	212	212	212
AR(1) p-value	0.000	0.000	0.000	0.000
AR(2) p-value	0.160	0.226	0.112	0.107
Sargan p-value	0.056	0.715	0.291	0.811
Hansen p-value	0.436	0.591	0.712	0.796

Source: Authors' calculation.

*Note: t-statistics are in parentheses. Significance levels: 1%, ***; 5%, **; 10%, *. The mean values of the dependent variables (Total RD, Capital RD, Total ED, and Capital ED) are positive, indicating overestimation (planned values are higher than actual executed values). A positive sign indicates greater overestimation (optimistic planning), while a negative sign indicates lower overestimation (actual revenues and expenditures tend to match planned values).*

Table 4 presents the results for all Croatian LGs for the entire sample period. Lagged variables have a positive and significant impact on all revenue and expenditure deviations, highlighting the persistence of deviations from previous years. Population size negatively and significantly affects deviations in total revenues, indicating that larger LGs tend to plan total revenues more accurately. As the population increases, Croatian LGs show lower overestimation of total revenues, meaning planned values are closely aligned with actual figures. This finding corresponds with evidence from Spanish LGs by Cuadrado-Ballesteros et al. (2022) and Ríos et al. (2018). Additionally, higher unemployment rates in Croatian LGs are associated with lower deviations in capital revenues and total expenditures, suggesting more conservative budget planning. As a result, Croatian LGs overestimate capital revenues and total expenditures less, with planned values well aligned to actual outcomes. Grants are estimated similarly to own revenues, contributing to a reduction in the overestimation of total revenues and expenditures, consistent with findings observed in Slovenian LGs.

Table 4. Results of dynamic system-GMM for economic determinants of BDs – Croatian LGs during 2016–2023

	Total RD	Capital RD	Total ED	Capital ED
Total RD lag	**0.47*** (-9.27)**			
Capital RD lag		**0.12*** (-3.44)**		
Total ED lag			**0.48*** (-10.63)**	
Capital ED lag				**0.20*** (-4.94)**
Population	**-0.22** (-2.12)**	-0.17 (-1.09)	-0.01 (-0.19)	-0.09 (-0.63)
Unemployment rate	0 (-0.21)	**-0.02* (-1.66)**	**-0.01* (-1.88)**	0 (-0.40)
Residents income	0.12 (-0.62)	0.14 (-0.31)	-0.14 (-0.95)	0.1 (-0.41)
Own revenues	0.15 (-0.17)	-1.69 (-0.90)	-0.54 (-0.78)	0.01 (-0.01)
Grants	0.64 (-0.82)	-0.77 (-0.47)	-0.1 (-0.18)	0.31 (-0.32)
Tax revenues	0.46 (-1.63)	0.69 (-1)	0.37 (-1.63)	0.22 (-0.55)
Revenue growth	**-0.00*** (-4.55)**	0 (-0.37)		
Expenditure growth			**-0.00*** (-5.28)**	0 (-0.49)
Budget balance	0 (-1.27)	0 (-0.49)	0 (-0.58)	0 (-1.58)
Constant	-0.18 (-0.14)	1.28 (-0.43)	1.26 (-1.24)	-0.09 (-0.06)
Observations	3,892	3,892	3,892	3,892
Number of id	556	556	556	556
AR(1) p-value	0.000	0.000	0.000	0.000
AR(2) p-value	0.014	0.244	0.807	0.636
Sargan p-value	0.023	0.488	0.004	0.019
Hansen p-value	0.107	0.629	0.033	0.095

Source: Authors' calculation.

*Note: t-statistics are in parentheses. Significance levels: 1%, ***; 5%, **; 10%, *. The mean values of the dependent variables (Total RD, Capital RD, Total ED, and Capital ED) are positive, indicating overestimation (planned values are higher than actual executed values). A positive sign indicates greater overestimation (optimistic planning), while a negative sign indicates lower overestimation (actual revenues and expenditures tend to match planned values).*

To test the robustness of our results, we split the sample into two periods: before the COVID-19 pandemic (2016-2019) and during the pandemic (2020-2023). The results are presented in the Appendix – Tables A3-A8, supporting our previous findings, with the impact of lagged variables generally stronger in the recent period, suggesting that LGs are less flexible or that uncertainty has increased due to the pandemic. The most persistent and strongest predictor of deviations is the previous deviation in revenues and expenditures. Greater economic power (higher residents' income) consistently reduces deviations, especially for Croatia and the overall sample, although this effect weakens after 2020. Significant effects often differ between Croatia and Slovenia, indicating differences in institutional and fiscal frameworks. Both Croatian and Slovenian LGs demonstrate that socio-economic conditions and fiscal capacity significantly affect budget credibility. Larger population size and higher residents' income reduce BDs, while higher unemployment increases them. Furthermore, a stronger fiscal position – reflected by a greater share of own revenues and grants – leads to more accurate planning of revenues and expenditures in both normal and uncertain times. In conclusion, across 768 LGs in two neighbouring EU countries, Slovenian LGs appear to plan more accurately according to their economic conditions.

We empirically confirmed the hypotheses related to BDs regarding socio-economic and demographic determinants. Croatian LGs with larger populations have lower deviations in total revenues over the entire period and lower deviations in capital expenditures during the pre-pandemic period. Slovenian LGs with larger populations plan their capital revenues and total expenditures more accurately during the pre-pandemic period. Slovenian LGs with higher unemployment rates have a higher deviation in capital expenditures. In periods of uncertainty when unemployment rates are higher, BDs are higher, i.e., LGs overestimate expenditures. Slovenian LGs with higher residents' incomes have lower deviations in capital expenditures during the pandemic period. LGs with wealthier residents are more accurate in planning revenues and expenditures.

Furthermore, we empirically confirmed the hypotheses related to BDs regarding fiscal capacity and revenue structure. Slovenian LGs with a higher share of own revenues have lower deviations in total revenues, total expenditures, and capital expenditures. LGs with better financial situations, i.e., higher shares of own revenues, tend to plan revenues and expenditures more accurately. Similarly, Slovenian LGs with a higher share of grants have lower deviations in total revenues, total expenditures, and capital expenditures. LGs with a higher share of grants demonstrate better planning of revenues and expenditures. Additionally, Slovenian LGs with a higher share of grants show lower deviations in total expenditures during the pre-pandemic period.

The determinants of revenue growth, expenditure growth, and budget balance for LGs are significant in some models. Still, their impact on BDs is very low, so we will not analyse them further.

Based on the results of the analysis, specific recommendations can be drawn for improving fiscal policy and management of LGs. First, strengthening budgetary discipline and predictability is essential. It is necessary to enhance control over the recurrence of BDs, as the inertia of deviations from previous years has an extremely strong and lasting impact. LGs should regularly analyse the causes of deviations and introduce measures to reduce continuous deviations, for example, through stricter internal controls and more realistic planning. Second, strengthening own revenues and diversifying sources is important. Own revenues and grants have a strong and variable impact on BDs, especially in capital revenues and expenditures. A practical recommendation is to encourage more stable and reliable sources of own revenues and, when using grants, to increase capacities for more precise planning of fund spending to reduce uncertainties and instability. Third, an analytical approach to planning in both large and small LGs should be adopted. LGs with larger populations tend to achieve smaller deviations, especially in Croatia. Additional support is recommended for smaller units through joint budget planning services, training, and the introduction of digital tools for better budget preparation. Fourth, flexible planning in the context of economic shocks is necessary. The impact of key economic indicators (residents' incomes, unemployment rates) was stronger before the pandemic than after, indicating the need for faster fiscal policy adjustments in crises. Developing scenarios and crisis plans can help local units adjust budgets more precisely and avoid large deviations during unstable periods. Fifth, the establishment of stricter procedures for capital projects is recommended. Instability in capital revenues and expenditures suggests the necessity of introducing stricter procedures and multiple checks in capital project planning, including independent evaluations and better linking of grants, own revenues, and budget estimates with project feasibility assessments. Lastly, encouraging the growth of incomes and expenditures through development policies is advised. The results show that growing revenues and expenditures reduce BDs. Active development policies, investment promotion, and improvement of the local business climate can contribute to long-term budget stability and predictability. These recommendations are based on identified statistical relationships and can serve as guidelines for more responsible, predictable, and stable fiscal planning of LGs.

5 Conclusion and Recommendations

This study highlights crucial practical implications for fiscal policy and local budget management in Slovenia and Croatia. Politicians, aiming to signal competence and promote personal or electoral interests, may unintentionally or intentionally adopt incorrect budgeting practices. The budget, as a key policy document, requires accurate forecasting of revenues and expenditures to ensure sustainable fiscal management. When LGs overestimate revenues

or underestimate expenditures, they risk overspending beyond planned limits, leading to budget deficits and increased debt burdens.

Stronger budget legislation, combined with improved quality in budget planning and execution, can reduce politicians' incentives to manipulate budget forecasts. LGs with sounder financial conditions and more transparent fiscal practices tend to generate more rational and realistic budget forecasts. This underscores the importance of legislative frameworks that enforce transparency, accountability, and fiscal discipline at the local level.

The innovative aspect of this research lies in analysing eight economic determinants across all 768 LGs in Slovenia and Croatia, expanding upon previous studies by using a broader range of dependent variables, including total and capital revenues and expenditures. The panel data spanning eight years enables nuanced insights into differences in budget planning and execution between the two countries.

Our findings show that Slovenian LGs generally demonstrate higher forecasting accuracy for total revenues, total expenditures and capital expenditures, while Croatian LGs exhibit somewhat better accuracy in capital revenue projections. In Croatia, key factors such as a higher population correspond to lower BDs for both total revenues and capital expenditures. In Slovenia, higher own revenues and grants help reduce total revenue, and both total and capital expenditures overestimations. Furthermore, population size, grants, and residents' income correlate with improved capital revenues and total and capital expenditure deviations.

To enhance budget credibility and avoid politically motivated forecasting biases – such as overestimating revenues to appear popular and underestimating expenditures – budget planning processes should emphasise transparency, external audits, and stakeholder participation. Reliable local revenue and expenditure plans are essential for effective public financial management.

The findings provide a foundation for establishing unified budget credibility assessment tools and instruments at the local level. Such instruments can support the design of context-specific fiscal policies and improve governance practices across diverse LG environments.

Future research could extend this analysis to assess the combined economic and political determinants of budget credibility in other EU and non-EU countries, enhancing generalizability and contributing further to public administration literature.

This study faces limitations, notably the exclusion of some economic determinants due to data unavailability for both countries at the local level, and challenges in collecting complete plan values from enacted budgets, as some LGs lack budget transparency or have incomplete records. Addressing these gaps presents opportunities for future in-depth research.

References

Act on the Right of Access to Information (2022). Zakon o pravu na pristup informacijama. Pročišćeni tekst zakona. NN 25/13, 85/15, 69/22. At <https://www.zakon.hr/z/126/Zakon-o-pravu-na-pristup-informacijama>, accessed 15 November 2024.

Alesina, A. and Passalacqua, A. (2016). The Political Economy of Government Debt. In Taylor, J. and Uhlig, H., eds. Handbook of Macroeconomics. Elsevier B.V. https://doi.org/10.1016/bs.hesmac.2016.03.014.

Alt, J. E., Lassen, D. D. and Rose, S. (2006). The Causes of Fiscal Transparency: Evidence from the U.S. States. IMF Staff Papers, 53, pp. 30–57. https://doi.org/10.2307/30036021

Arellano, M. and Bover, O. (1995). Another look at the instrumental variable estimation of error-components models. Journal of Econometrics, 68(1), pp. 29–51. http://dx.doi.org/10.1016/0304-4076(94)01642-D.

Benito, B. and Bastida, F. (2009). Budget Transparency, Fiscal Performance, and Political Turnout: An International Approach. Public Administration Review, 69(3), pp. 403–417. https://doi.org/10.1111/j.1540-6210.2009.01988.x.

Benito, B., Guillamón, M. D. and Bastida, F. (2015). Budget forecast deviations in municipal governments: Determinants and implications. Australian Accounting Review, 25(1), pp. 45–70. https://doi.org/10.1111/auar.12071.

Bischoff, I. and Gohout, W. (2010). The political economy of tax projections. International Tax and Public Finance, 17(2), pp. 133–150. https://doi.org/10.1007/s10797-008-9103-y.

Blundell, R. and Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. Journal of Econometrics, 87(1), pp. 115–143. https://doi.org/10.1016/S0304-4076(98)00009-8.

Bohn, F. and Veiga, F. J. (2021). Political forecast cycles. European Journal of Political Economy, 66 (April 2020), 101934, pp. 1–27. https://doi.org/10.1016/j.ejpoleco.2020.101934.

Boukari, M. and Veiga, F. J. (2018). Disentangling political and institutional determinants of budget forecast errors: A comparative approach. Journal of Comparative Economics, 46(4), pp. 1030–1045. https://doi.org/10.1016/j.jce.2018.03.002.

Bovens, M. (2007). Analysing and Assessing Accountability: A Conceptual Framework. European Law Journal, 13(4), pp. 447–468. https://doi.org/10.1111/j.1468-0386.2007.00378.x

Boylan, R. (2008). Political distortions in state forecasts. Public Choice, 136, pp. 411–427. https://doi.org/10.1007/s11127-008-9303-0.

Buchanan, J. M. and Wagner, E. R. (1977). Democracy in Deficit: The Political Legacy of Lord Keynes.

Budget Act (2022). Zakon o proračunu. NN 144/21. At <https://www.zakon.hr/z/283/Zakon-o-prora%C4%8Dunu>, accessed 15 November 2024.

Christensen, L. T. and Cheney, G. (2015). Peering into Transparency: Challenging Ideals, Proxies, and Organizational Practices. Communication Theory, 25, pp. 70–90. https://doi.org/10.1111/comt.12052

Couture, J. and Imbeau, L. M. (2009). Do Governments Manipulate Their Revenue Forecasts? Budget Speech and Budget Outcomes in the Canadian Provinces. In Do They Walk Like They Talk? Speech and Action in Policy Processes, Studies in Public Choice, pp. 155–166. New York: Springer.

Croatian Bureau of Statistics – CBS (2024). At <https://podaci.dzs.hr/media/bz5hplcj/gradovi-u-statistici.xlsx>, accessed 15 November 2024.

Cuadrado-Ballesteros, B., Guillamón, M. D. and Ríos, A. M. (2022). Does gender matter in budget deviations? An empirical assessment of Spanish local governments. Public Management Review, 24 (10), pp. 1521–1544. https://doi.org/10.1080/14719037.2021.1912816.

Dabla-Norris, E., Allen, R., Zanna, L.-F., Prakash, T., Kvintradze, E., Lledo, V., Yackovlev, I. and Gollwitzer, S. (2010). Budget institutions and fiscal performance in low-income countries. IMF Working Paper WP/10/80, Washington, DC.

DiMaggio, J. and Powell, W. (1983). The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organisational Fields. American Sociological Review, 48 (2), pp. 147–160. https://doi.org/10.2307/2095101.

Employment Service of Slovenia (2024). The unemployment rate for the period 2015–2023. At <https://www.ess.gov.si/fileadmin/user_upload/Trg_dela/Dokumenti_TD/Trg_dela_v_stevilkah/Stopnje/Stopnja_BO_obcine_2005-2024.xls>, accessed 9 December 2024.

European Commission (2020). Annual Management and Performance Report for the EU Budget. At <https://www.europarl.europa.eu/cmsdata/209549/annual-management-and-performance-report-2019_en_1.pdf>, accessed 4 September 2025.

Fung, A. (2015). Putting the Public Back into Governance: The Challenges of Citizen Participation and Its Future. Public Administration Review, 75(4), pp. 513–522. https://doi.org/10.1111/puar.12361

Giroux, G. and McLelland, A. J. (2003). Governance Structures and Accounting at Large Municipalities. Journal of Accounting and Public Policy, 22(3), pp. 203–230. https://doi.org/10.1016/S0278-4254(03)00020-6.

Goeminne, S., Geys, B. and Smolders, C. (2008). Political fragmentation and projected tax revenues: evidence from Flemish municipalities. International Tax and Public Finance, 15(3), pp. 297–315. https://doi.org/10.1007/s10797-007-9021-4.

Guillamón, M. D., Ríos, A. M. and Prijaković, S. (2024). The impact of budget transparency on budget credibility: evidence from Croatian cities. South East European Journal of Economics and Business, 19(2), pp. 119–135. https://doi.org/10.2478/jeb-2024-0019.

Hibbs, D. (1977). Political parties and macroeconomic policy. American Political Science Review, 71, pp. 146–187.

International Budget Partnership – IBP (no date). Budget credibility. At <https://internationalbudget.org/initiative/budget-credibility>, accessed 9 December 2024.

International Budget Partnership – IBP (2024). Strengthening Budget Credibility: The Pocket Guide for Auditors. At <https://internationalbudget.org/wp-content/uploads/SAI-handbook-pocket-guide-FA.pdf>, accessed 4 September 2025.

Jorge, S., Cerqueira, P. and Furtado, S. (2023). Municipal revenue over-budgeting: a dynamic analysis of its determinants. Local Government Studies, 49(3), pp. 644–675. https://doi.org/10.1080/03003930.2021.2025359.

Lee, T. H. and Kwak, S. (2020). Revenue volatility and forecast errors: evidence from Korean local governments. Local Government Studies, 46(6), pp. 979–994. https://doi.org/10.1080/03003930.2019.1708726.

Miller, G. J. (2005). The Political Evolution of Principal-Agent Models. Annual Review of Political Science, 8, pp. 203–225. https://doi.org/10.1146/annurev.polisci.8.082103.104840

Miller, G. J. and Whitford, A. B. (2007). The Principal's Moral Hazard: Constraints on the Use of Incentives in Hierarchy. Journal of Public Administration Research and Theory, 17(2), pp. 213–233. https://doi.org/10.1093/jopart/mul004

Ministry of Finance of the Republic of Croatia – MoF (2024a). Ostvarenje proračuna JLP(R)S za period 2015–2023. At <https://mfin.gov.hr/istaknute-teme/lokalna-samouprava/financijski-izvjestaji-jlp-r-s/203>, accessed 9 December 2024.

Ministry of Finance of the Republic of Slovenia – MoF (2024b). Izvješće o prihodima i rashodima općina za period 2015–2023. At <https://www.gov.si/teme/financiranje-obcin>, accessed 9 December 2024.

Ministry of Regional Development and European Union Funds (2024). Average residents' income per capita and the unemployment rate for the period 2015–2023.

Moynihan, D. P. (2008). The Dynamics of Performance Management: Constructing Information and Reform. Georgetown University Press. Available at: <https://www.jstor.org/stable/j.ctt2tt51c>, accessed 4 September 2025.

Musgrave, R. A. and Musgrave, P. (1989). Public Finance in Theory and Practice. In Mcgraw-Hill International Editions. https://doi.org/10.1515/1553-3832.1898.

Piotrowski, S. J. and Van Ryzin, G. G. (2007). Citizen attitudes Toward transparency in local government. American Review of Public Administration, 37(3), pp. 306–323. https://doi.org/10.1177/0275074006296777.

Przeworski, A., Stokes, S. C. and Manin, B. (2012). Democracy, Accountability, and Representation. Cambridge University Press. https://doi.org/10.1017/CBO9781139175104

Public Expenditure and Financial Accountability – PEFA (2018). PEFA Handbook, Volume II: PEFA Assessment Field Guide. Second edition, December 2018. Washington DC, USA. At <https://www.pefa.org/sites/default/files/resources/downloads/200225%20PEFA%20Handbook%20Vol%20II_v2-New-logo-NewCover_2023.pdf>, accessed 9 December 2024.

Public Expenditure and Financial Accountability – PEFA (2019). PEFA Handbook: Using PEFA to Support Public Financial Management Improvement. IV(January).

Prijaković, S. (2024). Budget credibility of Croatian counties, cities and municipalities for 2020–2022. IPF Notes, 17(136), pp. 1–11. https://doi.org/10.3326/in.2024.136

Prijaković, S. (2025). Budget credibility under scrutiny: comparative analysis of Croatian and Slovenian local units. IPF Notes, 18(143), pp. 1–13. https://doi.org/10.3326/in.2025.143

Public Finance Act (1999). Zakon o javnih financah. Uradni list Republike Slovenije (No. 79/1999, 30 September 1999). At <https://pisrs.si/pregledPredpisa?id=ZAKO1227>, accessed 9 December 2024.

Ríos, A. M., Guillamón, M. D., Benito, B. and Bastida, F. (2018). The influence of transparency on budget forecast deviations in municipal governments. Journal of Forecasting, 37(4), pp. 457–474. https://doi.org/10.1002/for.2513.

Roodman, D. (2009). A note on the theme of too many instruments. Oxford Bulletin of Economics and Statistics, 71(1), pp. 135–158. https://doi.org/10.1111/j.1468-0084.2008.00542.x.

Rullán, X. O. and Villalonga, J. R. (2018). The determinants of regional budget forecast errors in federal economies: Spain 1995–2013. Hacienda Publica Espanola / Review of Public Economics, 226(3), pp. 85–121. https://doi.org/10.7866/HPE-RPE.18.3.4.

Sarr, B. (2015). Credibility and Reliability of Government Budgets : Does Fiscal Transparency Matter? IBP – International Budget Partnership – Working Paper 5, pp. 1–30. At <https://internationalbudget.org/wp-content/uploads/Credibility-and-Reliability-of-Government-Budgets-Working-Papers.pdf>, accessed 4 September 2025.

Serritzlew, S. (2005). Breaking Budgets: An Empirical Examination of Danish Municipalities. Financial Accountability and Management, 21(4), pp. 413–435. https://doi.org/10.1111/j.0267-4424.2005.00227.x.

Siregar, B. and Susanti, L. (2019). Determinants of budget forecast errors and their impacts on budget effectiveness: evidence from Indonesia. Journal of Economics, Business, and Accountancy Ventura, 21(3), pp. 391–399. https://doi.org/10.14414/jebav.v21i3.1468.

Statistical office of the Republic of Slovenia (2024). Data on population and average monthly net salary by municipalities (a proxy for residents' income). At <https://pxweb.stat.si/SiStat/en/Podrocja/Index/583/regional-overview>, accessed 10 December 2024.

Wehner, J. (2013). Electoral Budget Cycles in Legislatures. Legislative Studies Quarterly, 38(4), pp. 545–570. https://doi.org/10.1111/lsq.12027

Wehner, J. and de Renzio, P. (2013). Citizens, Legislators, and Executive Disclosure: The Political Determinants of Fiscal Transparency. World Development, 41, pp. 96–108. https://doi.org/10.1016/j.worlddev.2012.06.005

Wildavsky, A. (1961). Political Implications of Budgetary Reform. Public Administration Review, 21(4), pp. 183–190. https://doi.org/10.2307/973628

Ye, C. (2023). A Study on the Impact of Fiscal Pressure on the Deviation of Local Government Budget Revenues. Journal of Risk Analysis and Crisis Response, 13 (2), pp. 148–160. https://doi.org/10.54560/jracr.v13i2.362.

Zimmerman, J. L. (1977). The Municipal Accounting Maze: An Analysis of Political Incentives. Journal of Accounting Research, 15 (Studies on Measurement and Evaluation of the Economic Efficiency of Public and Private Nonprofit Institutions), pp. 107–144. https://doi.org/10.2307/2490636.

APPENDIX

Table A1. Descriptive statistics for all used variables

	All LGs				Slovenian LGs				Croatian LGs			
	Mean	St. dev.	Min	Max	Mean	St. dev.	Min	Max	Mean	St. dev.	Min	Max
Dependent variables												
Total RD	17.56	26.41	-100	91.24	5.79	19.11	-100	75.05	22.05	27.42	-100	91.24
Capital RD	43.72	60.70	-100	100	44.63	59.73	-100	100	43.37	61.06	-100	100
Total ED	24.24	23.92	-100	93.63	15.29	17.54	-100	77.57	27.66	25.12	-100	93.63
Capital ED	41.84	36.24	-100	100	27.09	31.74	-100	97	47.47	36.27	-100	100
Independent variables												
Population	3.55	0.45	2.2	5.89	3.73	0.43	2.51	5.47	3.48	0.43	2.2	5.89
Unemployment rate	9.24	6.56	0.41	49.56	7.58	3.36	1.75	24.03	9.88	7.33	0.41	49.56
Residents income	6.29	0.72	4.59	7.86	7.38	0.15	6.94	7.86	5.88	0.29	4.59	6.69
Own revenues	0.70	0.2	0.07	1	0.83	0.12	0.23	1	0.65	0.2	0.07	1
Grants	0.28	0.2	0	0.93	0.15	0.12	0.01	0.77	0.32	0.21	0	0.93
Tax revenues	0.48	0.2	0.01	0.91	0.68	0.11	0.16	0.91	0.4	0.17	0.01	0.88
Revenue growth	13.05	31.52	-87.38	553.76	7.89	24.39	-85.51	226.61	15.02	33.64	-87.38	553.76
Expenditure growth	13.23	36.12	-88.71	856.61	7.76	23.64	-85.44	159.57	15.31	39.68	-88.71	856.61
Budget balance	0.3	0.16	-1.25	0.88	0.32	0.11	-0.13	0.77	0.29	0.17	-1.25	0.88
	N=6,116 n=768 T=8				N=1,690 n=212 T=8				N=4,426 n=556 T=8			

Source: Authors' calculation.

Note: In some cases we have fewer observations as enacted budgets of some LGs were not available.

Table A2. Correlation matrix for all LGs

	Total RD	Total RD lag	Capital RD	Capital RD lag	Total ED	Total ED lag	Capital ED	Capital ED lag	Population	Unemployment rate	Own revenues	Grants	Residents income	Tax revenues	Revenue growth	Expenditure growth	Budget balance
Total RD	1																
Total RD lag	0.55	1															
Capital RD	0.19	0.13	1														
Capital RD lag	0.12	0.21	0.33	1													
Total ED	0.81	0.49	0.14	0.11	1												
Total ED lag	0.49	0.81	0.11	0.15	0.53	1											
Capital ED	0.62	0.36	0.12	0.08	0.82	0.37	1										
Capital ED lag	0.37	0.62	0.08	0.12	0.38	0.82	0.36	1									
Population	-0.22	-0.24	-0.15	-0.16	-0.23	-0.24	-0.09	-0.09	1								
Unemployment rate	0.09	0.05	-0.04	-0.03	0.04	0.02	0.02	0.01	-0.13	1							
Own revenues	-0.06	-0.23	0.06	0.01	-0.04	-0.16	-0.01	-0.09	0.27	-0.35	1						
Grants	0.08	0.22	0.03	0.01	0.04	0.16	0	0.08	-0.26	0.35	-0.96	1					
Residents income	-0.31	-0.29	-0.01	-0.02	-0.25	-0.24	-0.24	-0.23	0.31	-0.41	0.41	-0.39	1				
Tax revenues	-0.1	-0.23	0.06	0.02	-0.09	-0.17	-0.09	-0.13	0.28	-0.37	0.78	-0.74	0.63	1			
Revenue growth	-0.3	0.2	-0.06	0.07	-0.17	0.13	-0.11	0.12	-0.06	-0.04	-0.29	0.26	-0.07	-0.2	1		
Expenditure growth	-0.12	0.08	-0.02	0.01	-0.23	0.26	-0.2	0.27	-0.05	-0.04	-0.19	0.18	-0.07	-0.11	0.6	1	
Budget balance	-0.09	0.11	0.04	0.03	0.06	0.1	-0.17	-0.04	-0.13	-0.06	-0.2	0.27	0.12	-0.03	0.34	0.13	1

Source: Authors' calculation.

Table A3. Results of dynamic system-GMM for economic determinants of BDs – all LGs during 2016–2019

	Total RD	Capital RD	Total ED	Capital ED
Total RD lag	**0.41*** (-6.68)**			
Capital RD lag		0.13 (-0.69)		
Total ED lag			**0.33*** (-5.03)**	
Capital ED lag				**0.17*** (-3.09)**
Population	-0.11 (-1.23)	0.15 (-1.06)	**-0.09*** (-2.73)**	-0.07 (-0.87)
Unemployment rate	0 (-1.10)	**-0.02** (-2.55)**	**-0.01** (-2.03)**	0 (-0.33)
Residents income	**-0.16*** (-7.32)**	0.06 (-1.07)	**-0.11*** (-4.65)**	**-0.13*** (-3.16)**
Own revenues	**-1.56* (-1.71)**	**5.80*** (-3.32)**	-0.97 (-1.32)	-2.05 (-1.40)
Grants	-0.99 (-1.16)	**5.84*** (-3.49)**	-0.47 (-0.66)	-2.19 (-1.61)
Tax revenues	**0.73*** (-3.41)**	-0.59 (-1.32)	**0.51*** (-2.79)**	0.1 (-0.27)
Revenue growth	**-0.00*** (-4.73)**	**0.00** (-2.08)**		
Expenditure growth			**-0.00** (-2.00)**	**-0.00** (-2.13)**
Budget balance	0 (-1.14)	0 (-0.69)	**0.00** (-2.08)**	0 (-1.49)
Constant	**2.64*** (-3.28)**	**-5.65*** (-3.32)**	**1.79** (-2.56)**	**3.38** (-2.46)**
Observations	2,304	2,304	2,304	2,304
Number of id	768	768	768	768
AR(1) p-value	0.000	0.000	0.000	0.000
Sargan p-value	0.157	0.409	0.667	0.497
Hansen p-value	0.060	0.485	0.451	0.516

Source: Authors' calculation. Note: t-statistics are in parentheses. Significance levels: 1%, ***; 5%, **; 10%, *. Due to the short panel and the inability to perform the AR(2) test, there is no full confirmation of the GMM assumptions, but the coefficients can still be interpreted.

Table A4. Results of dynamic system-GMM for economic determinants of BDs – Slovenian LGs during 2016–2019

	Total RD	Capital RD	Total ED	Capital ED
Total RD lag	**0.35*** (-2.61)**			
Capital RD lag		0.08 (-0.86)		
Total ED lag			0.13 (-0.75)	
Capital ED lag				0.16 (-1.18)
Population	-0.06 (-0.50)	**-0.57** (-2.17)**	**-0.15* (-1.78)**	-0.21 (-1.52)
Unemployment rate	0 (-0.77)	-0.01 (-0.63)	0 (-0.24)	0.01 (-0.84)
Residents income	0.45 (-0.85)	0.9 (-0.74)	**0.95** (-2.17)**	**1.93* (-1.93)**
Own revenues	1.2 (-0.53)	4.93 (-0.98)	-1.89 (-1.36)	-2.21 (-0.98)
Grants	1.3 (-0.87)	4.56 (-0.98)	**-2.00* (-1.83)**	-2.6 (-1.58)
Tax revenues	-0.36 (-0.27)	0.93 (-0.36)	0.26 (-0.29)	0.34 (-0.19)
Revenue growth	**-0.01** (-2.36)**	**-0.01* (-1.83)**		
Expenditure growth			0 (-0.61)	0 (-0.57)
Budget balance	0 (-0.3)	**0.00* (-1.66)**	0 (-0.96)	0 (-0.83)
Constant	-3.87 (-1.15)	-9.31 (-0.94)	-4.51 (-1.50)	-11.04 (-1.59)
Observations	636	636	636	636
Number of id	212	212	212	212
AR(1) p-value	0.000	0.000	0.008	0.000
Sargan p-value	0.002	0.567	0.013	0.539
Hansen p-value	0.026	0.723	0.305	0.608

Source: Authors' calculation. Note: t-statistics are in parentheses. Significance levels: 1%, ***; 5%, **; 10%, *. Due to the short panel and the inability to perform the AR(2) test, there is no full confirmation of the GMM assumptions, but the coefficients can still be interpreted.

Table A5. Results of dynamic system-GMM for economic determinants of BDs – Croatian LGs during 2016–2019

	Total RD	Capital RD	Total ED	Capital ED
Total RD lag	**0.46*** (-6.48)**			
Capital RD lag		**0.34* (-1.84)**		
Total ED lag			**0.57*** (-2.62)**	
Capital ED lag				**0.18*** (-3.01)**
Population	-0.09 (-1.65)	-0.11 (-0.53)	0.04 (-0.21)	**-0.18* (-1.79)**
Unemployment rate	0 (-0.47)	**-0.02* (-1.79)**	0 (-0.05)	0 (-0.64)
Residents income	-0.08 (-0.43)	0.37 (-0.79)	-0.26 (-1.36)	0.16 (-0.58)
Own revenues	0.16 (-0.16)	**5.60*** (-3.55)**	-0.47 (-0.49)	-1.23 (-0.77)
Grants	0.52 (-0.56)	**6.46*** (-3.97)**	-0.22 (-0.27)	-1.18 (-0.82)
Tax revenues	0.43 (-1.41)	0.17 (-0.27)	0.5 (-1.31)	0.09 (-0.17)
Revenue growth	**-0.00*** (-2.71)**	0 (-0.47)		
Expenditure growth			**-0.00*** (-4.13)**	0 (-1.09)
Budget balance	0 (-0.34)	0 (-0.73)	0 (-0.94)	0 (-0.16)
Constant	0.52 (-0.42)	**-6.99* (-1.93)**	1.7 (-1.35)	1.19 (-0.66)
Observations	1,668	1,668	1,668	1,668
Number of id	556	556	556	556
AR(1) p-value	0.000	0.000	0.001	0.000
Sargan p-value	0.478	0.513	0.343	0.790
Hansen p-value	0.490	0.444	0.211	0.906

Source: Authors' calculation. Note: t-statistics are in parentheses. Significance levels: 1%, ***; 5%, **; 10%, *. Due to the short panel and the inability to perform the AR(2) test, there is no full confirmation of the GMM assumptions, but the coefficients can still be interpreted.

Table A6. Results of dynamic system-GMM for economic determinants of BDs – all LGs during 2020–2023

	Total RD	Capital RD	Total ED	Capital ED
Total RD lag	**0.49*** (-9.88)**			
Capital RD lag		**0.08* (-1.78)**		
Total ED lag			**0.32*** (-4.52)**	
Capital ED lag				**0.14** (-2.43)**
Population	-0.37 (-1.35)	0.53 (-0.93)	**-0.63** (-2.28)**	**-1.13*** (-2.93)**
Unemployment rate	0 (-0.53)	0.01 (-0.56)	0 (-0.87)	0.01 (-1.21)
Residents income	0.03 (-0.49)	0.04 (-0.46)	0.06 (-1)	**0.15* (-1.77)**
Own revenues	0.28 (-0.35)	4.17 (-1.47)	0.09 (-0.11)	0.89 (-0.72)
Grants	0.17 (-0.23)	2.97 (-1.25)	-0.17 (-0.26)	-0.69 (-0.69)
Tax revenues	-0.21 (-0.95)	**-1.43* (-1.71)**	-0.22 (-0.81)	**-1.34*** (-3.32)**
Revenue growth	**-0.00*** (-7.30)**	0 (-0.04)		
Expenditure growth			**-0.00*** (-3.64)**	**-0.00** (-2.23)**
Budget balance	0 (-0.17)	0 (-1.15)	0 (-0.06)	0 (-0.73)
Constant	1.17 (-1.47)	-4.95 (-1.50)	**2.21*** (-2.79)**	**3.63*** (-2.97)**
Observations	3,072	3,072	3,072	3,072
Number of id	768	768	768	768
AR(1) p-value	0.000	0.000	0.000	0.000
AR(2) p-value	0.777	0.165	0.489	0.577
Sargan p-value	0.000	0.024	0.000	0.000
Hansen p-value	0.000	0.091	0.000	0.001

Source: Authors' calculation. Note: t-statistics are in parentheses. Significance levels: 1%, ***; 5%, **; 10%, *.

Table A7. Results of dynamic system-GMM for economic determinants of BDs – Slovenian LGs during 2020-2023

	Total RD	Capital RD	Total ED	Capital ED
Total RD lag	0.25 (-1.62)			
Capital RD lag		0.01 (-0.18)		
Total ED lag			-0.09 (-0.82)	
Capital ED lag				-0.17 (-1.48)
Population	-0.12 (-1.00)	-0.14 (-0.39)	-0.01 (-0.09)	0.1 (-0.49)
Unemployment rate	0 (-0.1)	0.02 (-0.41)	0 (-0.37)	0.04 (-1.55)
Residents income	-0.13 (-0.32)	0.7 (-0.59)	-0.29 (-0.73)	**-1.73* (-1.82)**
Own revenues	-0.25 (-0.18)	5.69 (-1.21)	0.21 (-0.17)	-3.29 (-1.24)
Grants	-0.12 (-0.06)	6.37 (-1.4)	-0.52 (-0.31)	-4.7 (-1.57)
Tax revenues	0.97 (-0.95)	1.38 (-0.4)	-0.33 (-0.41)	-0.3 (-0.16)
Revenue growth	**-0.00*** **(-2.89)**	0 (-0.35)		
Expenditure growth			0 (-0.64)	0 -0.31
Budget balance	0 (-0.77)	0 (-0.02)	0 (-0.21)	0 (-0.02)
Constant	0.98 (-0.33)	-11.08 (-1.22)	2.54 (-0.76)	**16.21** **(-1.99)**
Observations	848	848	848	848
Number of id	212	212	212	212
AR(1) p-value	0.000	0.000	0.000	0.000
AR(2) p-value	0.126	0.346	0.021	0.688
Sargan p-value	0.070	0.702	0.305	0.114
Hansen p-value	0.402	0.523	0.666	0.179

Source: Authors' calculation. Note: t-statistics are in parentheses. Significance levels: 1%, ***; 5%, **; 10%, *.

Table A8. Results of dynamic system-GMM for economic determinants of BDs – Croatian LGs during 2020-2023

	Total RD	Capital RD	Total ED	Capital ED
Total RD lag	**0.56*** (-10.41)**			
Capital RD lag		0.08 (-1.5)		
Total ED lag			**0.53*** (-7.27)**	
Capital ED lag				**0.28*** (-3.42)**
Population	-0.21 (-1.41)	-0.34 (-1.18)	-0.11 (-0.90)	-0.28 (-1.01)
Unemployment rate	-0.01 (-1.56)	-0.03 (-1.64)	**-0.01** (-2.24)**	-0.01 (-0.79)
Residents income	0.06 (-0.3)	0.38 (-0.77)	-0.18 (-0.96)	-0.09 (-0.30)
Own revenues	-0.15 (-0.20)	**4.60** (-1.96)**	-0.25 (-0.43)	0.01 (-0.01)
Grants	0.21 (-0.3)	**4.80** (-2.28)**	-0.14 (-0.29)	-0.32 (-0.40)
Tax revenues	0.02 (-0.08)	-0.13 (-0.18)	-0.08 (-0.33)	-0.39 (-0.96)
Revenue growth	**-0.00*** (-6.80)**	0 (-0.4)		
Expenditure growth			**-0.00*** (-4.47)**	0 (-1.55)
Budget balance	0 (-1.08)	0 (-1.24)	0 (-0.73)	0 (-0.04)
Constant	0.58 (-0.41)	-4.9 (-1.44)	1.89 (-1.42)	2.14 (-1.01)
Observations	2,224	2,224	2,224	2,224
Number of id	556	556	556	556
AR(1) p-value	0.000	0.000	0.000	0.000
AR(2) p-value	0.295	0.630	0.801	0.726
Sargan p-value	0.273	0.066	0.004	0.012
Hansen p-value	0.149	0.198	0.011	0.026

Source: Authors' calculation. Note: t-statistics are in parentheses. Significance levels: 1%, ***; 5%, **; 10%, *.