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THE IMPACT OF LOCAL GOVERNMENTS' BUDGET TRANSPARENCY ON DEBT IN CROATIA

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Abstract

We investigate the impact of the budget transparency of local governments on debt using a panel data analysis of all 556 Croatian cities and municipalities over the 2014-2021 period. The analysis shows that increased budget transparency is associated with lower local government debt, i.e., budget transparency enables better public control of unnecessary debt. Additionally, regarding the legal regulation according to which higher own revenues enable higher borrowing, we examine the link between budget transparency and own revenues. The results show that local governments with higher budget transparency have higher own revenues, i.e., budget transparency can help local governments better control opportunistic borrowing and simultaneously increase their own revenues. Finally, we detect political budget cycles related to local government revenues and debt. This paper constitutes the first attempt to explore the effect of budget transparency on debt and own revenues in all local governments in one young democracy.

Keywords: *local governments; debt; own revenues; budget transparency; Croatia*

JEL Classification Code*: H71, H74*

1. Introduction

When public sector expenditures are greater than public sector revenues, the result is a public sector deficit. The sum of all public sector deficits incurred in the current and previous periods financed by borrowing constitutes the amount of public debt. Since overly high levels of debt are not good for economic growth, the public is often rightly concerned about the levels and sustainability of public debt (Cuadrado-Ballesteros and Bisogno 2022). Some established good governance practices can be perceived as effective options for monitoring and controlling excessive and/or opportunistic public debt levels (Akitoby et al. 2020). In this context, (online) fiscal transparency (FT) or budget transparency (BT)[1] stands out in the literature as one of the basic pillars of modern good governance. In fact, it is generally argued that greater FT/BT leaves room for the studious observation

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of political actions and decisions, i.e., rising public scrutiny (Prijaković 2022). In particular, by publishing budgetary documents online, continuously creating channels, and encouraging participation, the executive can pave the way and greatly facilitate citizens' scrutiny, monitoring, and constructive participation in government decisions and budgetary processes (Wu and Wang 2012). FT/BT also makes policymakers more accountable and motivates them to implement more credible, efficient, and effective public policies (de Renzio and Wehner 2017; Kopits and Craig 1998; Milesi-Ferretti 2004; Montes, Bastos, and de Oliveira 2019). Recently, authors such as Cuadrado-Ballesteros and Bisogno (2022) have presented evidence that government BT can also positively impact government financial sustainability.

The evidence drawn from previous studies mostly supports the idea that FT/BT leads to lower public debt (Alt and Lassen 2003, 2006a, 2006b; Gerunov 2016; Montes, Bastos, and de Oliveira 2019). The research thus far has been mostly focused on the impacts of FT on the national or state debt level (Alt and Lassen 2006a; Arbatli and Escolano 2015; Jarmuzek 2006) and on the impacts of online BT on the national debt level (Arbatli and Escolano 2015; Cuadrado-Ballesteros and Bisogno 2022; Gerunov 2016; Montes, Bastos, and de Oliveira 2019; Sedmihradská and Haas 2013). To the best of our knowledge, there are no studies on the effects of online BT on debt at the local government (LG) level.

To fill this gap, this paper aims to determine the impact of BT on LG debt using a panel data analysis of all 128 Croatian cities and 428 municipalities over the 2014-2021 period. The variable of interest is the Open Local Budget Index (OLBI) developed by the Croatian Institute of Public Finance (IPF), which in this study is used as a measure of LG BT (see Ott, Mačkić, and Bronić (2018)). The OLBI is measured annually based on the online availability of five key budgetary documents – the budget proposal, enacted budget, citizens' budget, mid-year report and year-end report – on official LG websites. The originality of this paper lies in its use of a unique and new measure of LG BT (OLBI) and a unique panel dataset of all 556 Croatian LGs over the 2014-2021 period. It contributes to the literature by constituting, to the best of our knowledge, the first attempt to explore the effect of LG BT on LG debt and own revenues in all LGs in one young democracy.

Section two details the theoretical framework and discusses previous empirical findings. Section three discusses our data and the empirical analysis supported by conditional fixed-effects negative binomial regression. Section four discusses the results and offers conclusions and recommendations.

2. Literature review

There are numerous definitions of FT/BT, and consequently, there are several methods of measuring FT/BT (International Budget Partnership 2008; OECD 2002; World Bank n.d.). Kopits and Craig (1998, p. 1) define FT "as openness toward the public at large about government structure and functions, fiscal policy intentions, public sector accounts, and projections. It involves ready access to reliable, comprehensive, timely, understandable, and internationally comparable information on government activities … so that the electorate and financial markets can accurately assess the government's financial position and the true costs and benefits of government activities, including their present and future economic and social implications." In contrast, the definition of BT is usually much narrower, focusing on the availability of budgetary documents and elements (e.g., types of revenues and expenditures, and narrative explanations). BT can be seen as making it possible for citizens to obtain complete, accurate, and timely information about government budgets presented in an understandable form (Ott, Mačkić, and Bronić 2018). Similar to da Cruz et al. (2016), this paper's measure of BT includes specific dimensions (timely publication (availability) and an understandable form for documents). Measurement of the completeness and accuracy dimensions is beyond the possibilities and scope of this research, as it would require exceptional human and financial capacity from our small team, especially given the large number of observed LGs.

There are several explanations for why and how better FT/BT might impact public debt. *Principal-agent theory* explains that voters (principals) normally want more competent politicians (agents) in office, as they will provide increasingly better public services for given levels of taxation (Alt and Lassen 2006b; Besley 2011; Ferejohn 1999; Shi and Svensson 2006). Since voters are less informed than politicians, problems arise when "bad" politicians are motivated to act in their own interest and meet the needs of their voters for local services by issuing debt. Such politicians provide more public services while not making voters aware, at the moment of debt issuance, that they will eventually have to repay that debt. Increased FT/BT contributes to solving citizens' problems by reducing information asymmetry and the incentives for "bad" politicians to seemingly mimic good and more competent politicians, thus limiting the extent to which an incumbent can use debt accumulation for opportunistic behaviour, i.e., to appear more competent than they truly are (Alt and Lassen 2003; de Araujo and Tejedo-Romero 2016; Laswad, Fisher, and Oyelere

2005). In some cases, FT/BT might also lead to an increase in taxes, expenditures and debt since, according to Ferejohn (1999), "increased transparency produces lower uncertainty about a political incumbent's actions, leading to increased voter confidence in the incumbent (or in voters' ability to distinguish good performance from bad performance), and therefore higher investment in public goods, that is, a willingness to pay higher taxes" (Alt, Lassen, and Skilling 2002, p. 233).

Additionally, the public choice school (e.g., Buchanan and Wagner 1977) argues that self-interested politicians and bureaucrats, whose aim is to secure re-election, are the reason for an excessive budget deficit and debt accumulation. The emergence of excessive deficits and public debt is explained by *fiscal illusion theory*, i.e., citizens do not like an increase in their tax liabilities, which is why opportunistic, self-interested, and re-election-seeking politicians try to avoid tax increases through opportunistic borrowing. Essentially, politicians try to hide the tax burden and increase the benefits of public expenditures (Campbell 2004). Puviani (1903) argued that the problem occurs when citizens do not have any insight into budgetary revenues (thus, they overestimate them), which in turn leads to a misperception about public expenditures because they want increasingly better public services. This results in budget overspending and higher deficits and/or debts (Benito and Bastida 2009; Dollery and Worthington 1996). Increasing FT/BT leaves room for in-depth budget examination by citizens, who have a better opportunity to examine the justification for borrowing, which can help them assess incumbent candidates more wisely. On the other hand, a lack of FT/BT and, thus, of citizens' knowledge of budget revenues and expenditures, accompanied by debt accumulation, significantly increases the likelihood of deception by self-interested and opportunistic incumbents (Jordan et al. 2017).

Finally, and similarly, according to *political budget cycle (PBC) theory*, politicians alter budgets before elections to deceive voters into believing that the economy is doing better than it actually is and to thus secure voter support (Philips 2016). In the pre-election period, politicians offer tax reductions, increase expenditures and/or reallocate expenditures towards more visible services in an effort to increase their chances of re-election (e.g., Rogoff 1990; Shi and Svensson 2003, 2006). Doing so may lead to unnecessary debt (Shi and Svensson 2003; Veiga and Veiga 2007). The assumption is that voters prefer competent incumbents who offer more public services for less tax paid, but due to information asymmetries in the pre-election period, voters usually do not know incumbents' competences. Thus, opportunistic incumbents try to manipulate and use the above-mentioned techniques to increase their chances of re-election. Indeed, in a meta-analysis of PBCs across 88 studies, Philips (2016) found evidence that "fiscal expenditures and government borrowing increase around elections, while revenues and fiscal balance decline" and that countries with low levels of democracy and development tend to show more evidence of PBCs. Shi and Svensson (2006) found that the absence of PBCs in developed countries can be partly explained by a larger proportion of informed voters, which alleviates the problems of asymmetric information that allow PBCs to take place. Similarly, Alt and Lassen (2006b) also found evidence that the FT level might have an effect on PBC manipulations, i.e., the higher the FT is, the lower the motivation and opportunity of incumbents to behave opportunistically.

The previous findings for advanced countries generally support the theoretical underpinnings by showing that an improvement in FT leads to public debt reduction (Alt and Lassen 2003, 2006b; Arbatli and Escolano 2015). However, the research focused on transitional countries (Jarmuzek 2006) or on the impacts of online BT on debt levels (Arbatli and Escolano 2015; Cuadrado-Ballesteros and Bisogno 2022; Gerunov 2016; Montes, Bastos, and de Oliveira 2019; Sedmihradská and Haas 2013) is inconclusive.

Using indicator based on the International Monetary Fund (IMF) Report on the Observance of Standards and Codes (ROSC) index, Jarmuzek (2006) analysed 27 transitional countries (including Croatia) and concluded that FT has not yet proven to be a very significant factor in shaping fiscal performance in transition economies. He found a nonsignificant negative relationship between FT and debt accumulation, arguing that "this may be a result of lack of consensus among politicians to restrain fiscal policy and/or no incentives for politicians to conceal fiscal laxity. The other reason why fiscal transparency is not statistically significant may stem from difficulties in measuring fiscal transparency and the relatively short time span of the rapid structural changes that have taken place in both macroeconomic and political environments." Arbatli and Escolano (2015) analysed the impact of both FT and BT for a sample of developing economies using the ROSC index and the Open Budget Index (OBI), which is focused on the online availability of eight key budgetary documents. For all specifications using the OBI, the effects of BT on debt were small and nonsignificant. The authors argued that perhaps the effect of BT/FT on fiscal performance depends on other variables or becomes significant only when the economic and institutional development of a country is above a certain threshold. Sedmihradská and Haas (2013) analysed the impact of BT on public debt (using the sample of countries for which the OBI was calculated, including Croatia) and did not find a significant relationship. They argued that BT without the engagement of civil society or advocacy groups is insufficient to improve governance. Gerunov (2016) also investigated the effect of BT (using OBIs) on government debt in a sample of 57 countries (including Croatia). Analysing the full sample, he found a significant negative effect of OBI on debt. However, checking whether the BT effects are the same in countries with different levels of income, he found that only in the first- and fourth-income quartiles did the effects of BT on debt reach statistical significance. He explained this result as likely reflecting variance in the institutional environments. Using the OBI and analysing 82 countries (developing and developed, including Croatia) over the 2006-2014 period, Montes, Bastos, and de Oliveira (2019) concluded that BT has a negative and statistically significant effect on debt, regardless of which sample is considered. Finally, using the OBI and analysing 110 counties (including Croatia) over the 2006-2019 period, Cuadrado-Ballesteros and Bisogno (2022) also concluded that BT has a statistically significant negative effect on debt.

To the best of our knowledge, no previous papers have focused on the impact of online BT/FT on debt at the lowest level of government (cities and municipalities). In line with the above-mentioned theoretical underpinnings and previous empirical findings, we hypothesize that there is a negative relationship between LG BT and debt.

In addition to investigating the impact of BT on the debt of Croatian LGs, given the Croatian context and legal regulations (which are explained below) in which higher own revenues enable higher borrowing, we want to examine whether this is true for both more transparent and less transparent LGs. In other words, we are interested in determining whether BT in the Croatian context can be a catalyst for reducing opportunistic debt and, simultaneously, increasing own revenues. Thus, since according to principal-agent theory voters can be expected to entrust greater resources to more transparent politicians (Alt, Lassen, and Skilling 2002; Ferejohn 1999), we hypothesize that LGs with higher BT also have higher own revenues because citizens place greater trust in them and are more willing to pay higher taxes.

3. Data and research methodology

3.1. The Dependent Variables, Reasoning and Contextual Factors

Most previous papers analysing the effect of FT/BT on debt levels have used the debt-to-GDP ratio variable (Alt and Lassen 2003, 2006b; Arbatli and Escolano 2015; Gerunov 2016; Jarmuzek 2006; Montes, Bastos, and de Oliveira 2019), while only a few have used variables related to the costs of debt financing (Chen et al. 2016; Wang and Shields 2014). Since there are no calculations of GDP at the local level in Croatia, we use the *debt-to-revenue* ratio of each city/municipality. As the variance in the *debt-to-revenue* ratio variable is greater than the mean, overdispersion is present; thus, we opt to use a negative binomial distribution.

As an EU country, Croatia must formally follow the guidelines of the Stability and Growth Pact, limiting annual total public debt and budget deficits (to 60% and 3% of GDP, respectively). Croatian LG debt was relatively low, e.g., in the 2018-2020 period, it was only 35% of the EU27 LG average (Eurostat 2021). Furthermore, Croatian annual LG debt was stable from 2014 to 2019 in absolute amounts, changing little over the years. On average, the total annual debt of cities was approximately HRK 3.3 bn, and that of municipalities was approximately HRK 414 mil (Ministry of Finance 2023). However, in 2020, because of problems caused by COVID-19, the central government offered additional loans to LGs, which is why LG annual debt exceptionally increased on average by 50%. However, as Croatian total public debt is greater than 60% of GDP, the national government has strictly limited LG borrowing through a conservative, rigid and centralized regulatory framework (NALAS 2018).

The Croatian Budget Act stipulates a balanced budget rule, i.e., the representative body of LGs can only pass a balanced budget, but LGs are allowed to run unanticipated deficits/surpluses occurring during the fiscal year. Furthermore, the same Act stipulates that LGs may incur short-term debt for their regular activities in cases of uneven revenue collection over the year (without any consent) and long-term debt for capital investments but only with the consent of the relevant local representative body and approval by the national government. The total annual debt service arising from borrowing for each LG may not exceed 20% of its revenues realized in the year preceding the fiscal year (we call them own revenues). Own revenues are calculated as total current revenues reduced by a) domestic and foreign grants and donations; b) co-financing by citizens for purposes of community self-government; and c) additional shares in both personal income tax (PIT) and equalization grants used for decentralized public services. LGs' own revenues are mostly PIT revenues. LG borrowing is regulated in detail by additional rules and other legislation, particularly the Rules on the procedure for borrowing, and issuing guarantees and granting approvals by units of local and regional self-government (2022). Furthermore, the Annual National Budget Execution Act sets an overall annual limit on the borrowing of all LGs (e.g., for 2021, up to a maximum of 3% of their total operating (current) revenues in 2020).

As mentioned above, given the Croatian context and legal regulations in which higher own revenues enable higher borrowing, we also analyse the impact of LG BT on the own revenues of LGs.

3.2. The Variable of Interest and Controls

The variable of interest is the IPF-developed *OLBI*, which represents the annual availability of five key budgetary documents on the official websites of Croatian LGs (the year-end report, mid-year report, enacted budget, budget proposal, and citizens' budget). This index takes a value from 0 to 5 based on the number of published documents. LGs are *legally obliged* to publish the year-end report, mid-year report and enacted budget by the Budget Act (2015) and the Act on the Right of Access to Information (2015). However, despite legal obligations, there are no sanctions for nondisclosure. The publication of the budget proposal and citizens' budget is only *recommended* by the Ministry of Finance. Consequently, three of the documents are subject to mandatory disclosure, and two are subject only to voluntary disclosure.

IPF researchers search LG websites at the same time each year and calculate the index on an annual basis, e.g., the OLBI 2021 contains the 2020 year-end report, 2021 mid-year report, 2022 budget proposal, 2022 enacted budget, and 2022 citizens' budget (Bronić et al. 2022). All of these documents were published in 2021; thus, OLBI 2021 represents the BT in 2021. These five documents were selected not only on the basis of the Croatian legislative framework but also following international practices (IBP 2015; OECD 2002), as each of them has a purpose and plays an important role in the democratic performance of the local budgetary process.

Regarding the described contextual framework related to own revenues and borrowing, as well as accounting for the previous theoretical and empirical findings, the control variables were chosen to cover both debt and own revenues since these two variables are inextricably linked in the Croatian context. Additionally, not changing the control variables allows us to establish whether BT can be a catalyst for better LG governance and LG financial sustainability, i.e., increasing own revenues and better control of unnecessary debt.

In accordance with PBC theory and related research, we also want to explore the existence of PBCs in Croatian LGs. Thus, we include dummies for *pre-election*, *election*, and *post-election* years, expecting that LG debt levels will be higher in (pre-)election years and lower in post-election years (Bastida, Beyaert, and Benito 2013). Conversely, we expect that own LG revenues will be lower in (pre-)election years and higher in post-election years.

Residents' *income pc* is a proxy for the overall development of the local economy. According to Wagner's law, the demand for government services is income elastic; thus, the share of goods and services provided by the government is expected to rise with income (Gupta 2007). Farnham (1985) also noted that per capita income reflects the positive income elasticity of demand for capital goods, which would imply a positive link between this variable and debt. Since in Croatia PIT (which is the most important source of own revenues) is progressive, we also expect that residents' income will be positively related to LGs' own revenues.

Chang et al. (2020) found that the operational capacity of tax administrations plays an important role in revenue collection and distribution performance, revealing a positive association between administrative capacity and tax performance. In fact, in Croatia, LGs can indeed have an impact on the tax collection process since it is stipulated by the Local Taxes Act (2022) that they can choose to either collect their local taxes themselves or pay the Tax Administration to collect those taxes for them. Thus, we include the number of *employees* in each LG as a proxy for the administrative capacity of LGs, hypothesizing that having a higher operational (administrative) capacity has a positive effect on the level of an LG's own revenues and therefore might also indirectly impact the level of debt.

As the total annual debt service arising from an LG's borrowing may not exceed 20% of its own revenues in the year preceding the fiscal year and LGs primarily borrow for long-term purposes, it is expected that LGs with higher own revenues will be able to borrow more and finance capital expenditures more easily. Accordingly, we aim to control for this connection between *capital expenditures pc* and LG's own revenue levels, expecting a positive association, as found by Pagano (2002) and Arimah (2005). For the same reasons, we expect a positive link between *capital expenditures pc* and debt.

Ferejohn (1999) argued that left-wing governments are more inclined to expand the public sector, thus possibly having an impact on budget size. Piotrowski and Van Ryzin (2007) also stressed that the direction of influence of political ideology may depend on the party in power. As noted by Benito and Bastida (2004), political theory has traditionally claimed that left-wing governments are laxer in their governmental financial discipline. Left-wing governments therefore advocate a larger public sector than right-wing governments and ultimately become more indebted. Consequently, we cannot neglect the political ideology of the LG; thus, we include the dummy variable *left-wing*, expecting a positive link between left-wing government and debt. Since left-wing governments prefer a larger public sector, we also expect a positive relationship between own revenues and left-wing government.

Table 1. Definitions of the variables

Variable	Description	Source	Expected sign with *debt-to revenue*
Dependent variables			
Debt-to-revenue	Share of total direct debt in total LG revenues	Ministry of Finance (2023)	
Own revenues pc	Total current revenues reduced by domestic and foreign grants and donations; the co-financing of citizens for purposes of community self-government; and additional shares in PIT and equalization grants for decentralized functions	Ministry of Finance (2023)	
Independent variable of interest			
OLBI	Open Local Budget Index, which annually captures the online availability of 5 key budgetary documents: the year-end report, mid-year report, budget proposal, enacted budget and citizens' budget	Bronic, Stanić, and Prijakovic (2022)	-
Control variables			
Pre-election year	Binary PBC variable (value of 1 in the year before local elections)		+
Election year	Binary PBC variable (value of 1 in the year of local elections)	State Electoral Commission (2023)	+
Post-election year	Binary PBC variable (value of 1 in the year after local elections)		-
Income pc	Residents' average annual pc income for each LG.	Ministry of Regional Development and EU Funds (2022); pc amounts are based on the CBS population estimates	+
Left wing	Dummy variable that takes the value of 1 if the local incumbent comes from the left of the political spectrum	State Electoral Commission (2023)	+
Employees	Number of employees in LG based on working hours	Ministry of Finance (2023)	+
Capital expenditures pc	Pc capital expenditures	Ministry of Finance (2023)	+
Interest share	Share of interest payments on debt in total expenditures	Ministry of Finance (2023)	+/-
Municipality	Dummy variable that takes the value of 1 if it is a municipality and 0 otherwise (city)	Authors' calculation	-
2020_year	Dummy variable that takes the value of 1 if it is 2020 year and 0 otherwise	Authors' calculation	-

Source: Authors

Finally, we want to control for the size of local self-government. According to the Croatian Law on Local and Regional Self-Government (2020), a municipality is a local self-government unit that is established for an area containing several inhabited settlements representing a natural, economic, and social whole connected by the common interests of the population. A city is a local self-government unit in which the county[2] seat is situated, that has more than 10,000 inhabitants and that represents an urban, historical, natural, economic, and social whole. In 2021, the average municipality had 2,556 inhabitants, and the average city had 15,833 inhabitants (CBS 2023). Since by law Croatian cities have more citizens and are responsible for a larger level of services, as argued by Cropf and Wendel (1998), it is reasonable to expect that they need to borrow more to keep up with this demand. It is also expected that as smaller local self-government units, municipalities will collect smaller amounts of own revenues. Thus, we include a dummy *municipality* to discern between cities and municipalities, expecting a negative relationship between own revenues and municipalities and between debt and municipalities. Additionally, we control for the share of interest payments on debt in total expenditures and the possible impact of the pandemic year on the debt levels due to the lockdown during the pandemic (*2020_year*). For a detailed description of the variables, data sources and expected sign related to our primary dependent variable, i.e., debt, see Table 1.

4. Results

Table 2 presents the descriptive statistics for all variables.

Panel A displays the continuous variables with basic summary statistics, and panel B displays the discrete variables with frequency tables. Regarding the dependent variable, *debt-to-revenue*, there are large

Table 2. Descriptive statistics

Panel A: Continuous variables					
Variable	Obs.	Mean	Std. Dev.	Min.	Max.
Debt-to-revenue	4,448	12.48	21.39	0	277.48
Own revenues pc	4,448	3,295	2,409	232	20,977
Income pc	4,448	28,033	7,412	8,633	57,896
Employees (ln)	4,448	2.49	0.99	0	8.03
Capital expenditures pc	4,448	1,496	1,600	0	23,384
Interest share (%)	4,448	0.05	0.18	0	6.99
Panel B: Discrete variables					
	Frequency	Percentage	Cumulative		
OLBI					
0	347	7.80	7.80		
1	380	8.54	16.34		
2	423	9.51	25.85		
3	789	17.74	43.59		
4	928	20.86	64.46		
5	1,581	35.54	100.00		
Pre-election year (1)	1,112	25.00	25.00		
otherwise (0)	3,336	75.00	100.00		
Election year (1)	1,112	25.00	25.00		
otherwise (0)	3,336	75.00	100.00		
Post-election year (1)	1,112	25.00	25.00		
otherwise (0)	3,336	75.00	100.00		
Left-wing (1)	1,101	24.75	24.75		
otherwise (0)	3,347	75.25	100.00		
Municipality (1)	3,424	76.98	76.98		
otherwise (0)	1,024	23.02	100.00		
2020_year (1)	556	12.50	12.50		
otherwise (0)	3,892	87.50	100.00		

Source: Authors' calculations

differences among LGs in the share of direct debt in total revenues (from 0 to 277%). Although some LGs have extremely high debt levels, the mean still shows a more realistic picture (approximately 12%) and is similar to the other variables, especially the economic and fiscal variables (a large disparity in the level of *capital expenditures pc* and in *residents' income pc*). This result confirms the ongoing issue of unequal regional development in Croatia (Klarić 2017) and the fragmentation of socioeconomic dimensions in the present Croatian territorial organization (Nejašmić and Njegač 2001). Regarding the variable of interest, i.e., *OLBI*, there is a higher frequency of the publication of a larger number of budgetary documents: approximately 36% of all LGs disclose all five documents, while 8% have none of the five documents available.

The main goal is to establish the impact of BT on debt levels in Croatian LGs. To do so, we use a unique database for the 2014-2021 period with highly balanced panel data covering an eight-year period (time-series dimension) and 556 Croatian LGs (cross-sectional dimension). We employ conditional fixed-effects negative binomial regression, which is a standard technique for working with overdispersed outcome variables, as in our case.

Tables 3 and 4 present the regression analysis results. Higher levels of LG BT are found to be associated with lower LG debt, as previously found by several authors (Cuadrado-Ballesteros and Bisogno 2022; Gerunov 2016; Montes, Bastos, and de Oliveira 2019). According to principal-agent theory, when voters are less informed than politicians, problems arise if "bad" politicians are motivated to act in their own interest and meet the needs of their voters for local services by issuing opportunistic debt. Our results show that an increase in BT reduces both this information asymmetry and the incentives for "bad" politicians to mimic good politicians, thus limiting the extent to which incumbents can use debt accumulation for opportunistic behaviour, i.e., to appear more competent than they actually are (Alt and Lassen 2003; de Araujo and Tejedo-Romero 2016; Laswad, Fisher, and Oyelere 2005).

We also find that LGs with higher BT have higher own revenues. This result is in line with the results obtained by Cuadrado-Ballesteros and Bisogno (2022) and with principal-agent theory. Thus, we show that BT can be a catalyst for both reducing opportunistic debt and, simultaneously, increasing own revenues. We find that BT not only reduces information asymmetry between citizens and incumbents but also increases citizens' trust in LGs, as voters are willing to pay higher taxes and entrust greater resources to more transparent politicians (Alt, Lassen, and Skilling 2002; Ferejohn 1999).

Table 3. Results of the conditional fixed-effects negative binomial regression for debt

Dependent variable: *debt-to-revenue*	Negative binomial	Marginal effects
OLBI	-0.039** (-2.40)	-0.039** (-2.40)
Pre-election year	0.149** (2.20)	0.149** (2.20)
Election year	0.291*** (5.78)	0.291*** (5.78)
Post-election year	-0.009 (-0.17)	-0.009 (-0.17)
Income pc	0.000*** (10.74)	0.000*** (10.74)
Left-wing	0.086 (1.49)	0.086 (1.49)
Employees	0.256*** (6.65)	0.256*** (6.65)
Capital expenditures pc	0.000*** (7.79)	0.000*** (7.79)
Interest share	0.000*** (4.43)	0.000*** (4.43)
Municipality	-0.621*** (-6.92)	-0.621*** (-6.92)
2020_year	0.174** (2.31)	0.174** (2.31)
Intercept	-2.439*** (-12.75)	
No. of observations	4,448	
No. of groups	556	
Wald chi^2	849.69***	

Source: Authors' calculations

Note: *z*- statistics in parentheses. Significance levels: *** 1%; ** 5%; * 10%.

Moreover, similar to Binet and Pentecôte (2004), Ashworth, Geys, and Heyndels (2005) and Bastida, Beyaert, and Benito (2013), we detect the existence of PBCs in Croatian LGs. In pre-election and election years, the debt level of Croatian LGs is higher since borrowing enables higher spending and the provision of more services, which may ultimately increase the probability of re-election for a politician. Bonfatti and Forni (2019) similarly stressed that the increased borrowing for greater spending in election and pre-election years is driven by the incumbent's desire for re-election.

Table 4. Results of the conditional fixed-effects negative binomial regression for own revenues

Dependent variable: *own revenues pc*	Negative binomial	Marginal effects
OLBI	0.027*** (7.27)	0.027*** (7.27)
Pre-election year	-0.064*** (-4.73)	-0.064** (-6.21)
Election year	-0.270*** (-26.09)	-0.270*** (-26.09)
Post-election year	0.029*** (2.97)	0.029*** (2.97)
Income pc	0.000*** (40.04)	0.000*** (40.04)
Left-wing	-0.007 (-0.43)	-0.007 (-0.43)
Employees	0.064*** (5.68)	0.064*** (5.68)
Capital expenditures pc	0.000*** (7.23)	0.000*** (7.23)
Interest share	0.000** (2.74)	0.000** (2.74)
Municipality	-0.300*** (-5.19)	-0.300*** (-5.19)
2020_year	0.005 (0.32)	0.005 (0.32)
Intercept	1.569*** (23.35)	
No. of observations	4,448	
No. of groups	556	
Wald chi^2	5,170***	

Source: Authors' calculations

Note: *z*- statistics in parentheses. Significance levels: *** 1%; ** 5%; * 10%.

We also find that opportunism comes on the revenue side as well. That is, local incumbents reduce LGs' own revenues, i.e., the tax burden on citizens, in (pre-) election years. This finding is in line with several previous studies (e.g., Aidt and Mooney 2014; Barberia and Avelino 2011; Katsimi and Sarantides 2012; Pettersson-Lidbom 2000; Tabellini and Persson 2003) that showed that revenues tend to decline in pre-election and/or election years. Furthermore, Philips (2016) concluded that in most cases, revenue-side gimmicks around elections are carried out with tax revenues (such as tax breaks to key voter groups, as shown by Khemani (2004)). As expected by PBC theory, we find that in post-election years, LGs return to the previous levels of their own revenues.

As expected, we find a positive association between *capital expenditures* and debt, as law establishes that LGs can resort to long- or short-term credit in any of its forms to finance their investment expenditure. The same positive association is also confirmed in the case of capital expenditures and own revenues, which is in line with previous studies (see, e.g., Arimah 2005; Pagano 2002).

We also show that the overall development of the local economy affects an LG's debt and own revenue levels. Using *income pc* as a proxy for local development, as expected, we find that there is a positive and significant effect of income on the level of debt and own revenues. This result can be explained in accordance with Wagner's law – the share of goods and services provided by the government is expected to rise with income (Gupta 2007); thus, citizens demand more capital goods. Additionally, since Croatian PIT (a major part of LGs' own revenues) is progressive, an increase in residents' income has a positive effect on LGs' own revenues.

As expected, the administrative capacity of an LG influences its performance in collecting its own revenues, and therefore, it can also indirectly influence the LG's debt. We find that the number of LG *employees* is positively associated with both debt and own revenue levels. Indeed, the operational strength of local administrations improves revenue performance (as suggested by Chang et al. (2020)), which also indirectly impacts the higher level of debt. As Croatian LGs can collect local taxes themselves, this result is expected.

Our dummy variable *municipality* shows that smaller amounts of own revenues pc and, consequently, debt levels are present at the municipal level, as a municipality is by definition smaller and performs a smaller number of functions/tasks than a city. Finally, as expected, we find that the share of debt in the revenues of local governments is significantly higher in the pandemic year 2020, which is explainable considering the relaxation of strict LG fiscal rules in Croatia due to the possibility of additional extraordinary borrowing.

5. Discussion and conclusion

Based on a panel data analysis of 556 Croatian LGs, we found a significant negative relationship between BT and debt. This finding means that increasing BT can serve as a good instrument for controlling and reducing opportunistic local debt levels. This is possible because BT reduces information asymmetry between citizens and incumbents, thus preventing the harmful intentions of opportunistic politicians to borrow in the pre-election period to increase services and, ultimately, the probability of their re-election.

Considering the legal framework in which higher own revenues enable higher borrowing, we wanted to examine whether this is true for both more transparent and less transparent LGs. We found that more transparent LGs have more own revenues, which can be interpreted as citizens having greater confidence in more transparent incumbents and tending to pay more taxes in a more transparent environment, expecting better local services. Therefore, our results show that BT can be a catalyst for more sustainable LG management, thus both reducing the opportunistic debt and increasing the own revenues of LGs.

We also demonstrated the presence of PBCs in Croatian LG debt and revenues. In pre-election and election years, the debt level of Croatian LGs is higher since borrowing enables politicians to increase the quantity and/or quality of local services (by increasing total LGs expenditures and deficits, as proven by Bronic, Stanić, and Prijakovic (2022)) and, thus, their chances of re-election. Opportunistic local politicians also manipulate own revenues in (pre-)election years. They reduce own revenues, i.e., the tax burden on citizens, in pre-election and election years to appear more competent to their constituencies. Consequently, they increase these revenues in post-election years so that they can borrow more in the upcoming (pre-)election period, thus demonstrating the standard political revenue cycle.

In addition to these main findings, from the other control variables, we can single out higher overall development of the local economy (proxied by *income pc*), which provides room for higher borrowing (debt) and higher own revenues, as is the case with higher operational (administrative) capacity (*employees*).

The main policy implication is the necessity for constant improvements in local BT, given that BT contributes to lower unnecessary debt and higher own revenues. By developing and expanding BT and introducing new ways of reporting and technological innovations, which is accompanied by an improvement in budget literacy and constructive public participation mechanisms, good governance, such as low debt and high own revenues, can be even more significantly affected.

Therefore, the national government, media, experts, nongovernmental organizations (NGOs) and all interested citizens should constantly pressure LGs to continuously improve their BT and include citizens in the budgetary process. At the same time, all actors, particularly national governments and LGs, should actively promote and implement programmes to improve the budget literacy of all citizens, especially of local representatives and media, so that they can scrutinize budgetary figures in depth and participate as constructively as possible in the budgetary process. In this way, citizens will not only be able to influence budgetary figures but also recognize opportunistic intentions and PBCs among local incumbents and evaluate them in local elections accordingly.

The main limitations of the paper are reflected in the quantitative nature of the BT measure and the use of a methodology that enables the association/relationship between the variables to be proven without a causal connection necessarily being shown. Therefore, future studies can examine the impact of a broader aspect of FT (or include qualitative dimensions of the OLBI) on the debt levels or debt determinants of LGs and use different methods to examine the causal relationships among the variables. Additionally, it would be interesting to see a similar study concerning another country with different contextual factors regarding fiscal rules.

Endnotes

1 The abbreviation FT encompasses both terms since FT is a broader term that also includes government structure and functions. The abbreviation BT solely represents budget transparency.

2 In addition to local self-government, the territorial organization of Croatia involves regional self-government units, consisting of 20 counties and the City of Zagreb, which has the status of both a city and a county. In this paper, the City of Zagreb is included as a city.

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