

FISCAL RULES OF LOCAL DEBT AND FINANCIAL FLEXIBILITY OF MUNICIPALLY-OWNED COMPANIES

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Abstract

This paper aims to verify whether local governments use municipally-owned corporations (MOCs) to avoid fiscal debt limits set by public finance law. If yes, how this off-budget indebtedness influences the financial flexibility of MOCs. We exploit the natural experiment of introducing new fiscal debt limits in Polish local governments in 2014 using panel data of unique 1294 MOCs owned by 756 municipalities for 2010-2018. We confirm that municipal services' corporatization is oriented toward overcoming the new restrictive fiscal debt rules via off-budget debt.

MOCs' debt subsidizes local public debt after 2014 when new indebtedness restrictions imposed on municipalities were in force. Consequently, tightening of fiscal rules related to sub-sovereign indebtedness decrease MOCs' financial flexibility measured by unused debt capacity while increasing their cash holdings, except for water service MOCs. Municipalities with lower debt capacity limited by the new fiscal debt rules have higher off-budget debt issued by transport MOCs.

1. Introduction

This paper aims to verify whether local governments use municipally-owned companies to avoid fiscal debt limits set by public finance law. And if they do, what are the effects of this off-budget indebtedness on municipal companies' financial flexibility?

Municipally owned corporations (MOCs) are organizations 'with independent corporate status, managed by an executive board appointed primarily by local government officials with majority public ownership' (Voorn, van Genugten, and van Thiel 2017). Grossi and Mussari (2008), Grossi and Thomasson (2011) have shown that the creation of MOC and other autonomous agencies like foundations aims to transfer part of local government's expenses and debt to these independent entities to comply with the fiscal restrictions. These actions are allowed by a lack of transparency of these firms (Chan, 2003) and not subject to consolidation.

Bel and Fageda (2009) and Cuadrado-Ballesteros et al. (2013) have added fiscal pressure that proxies budget management linked to the revenue levels obtainable by local governments, analyzing privatization processes in local governments. Bennett and Dilorenzo (1982) and Grossi and Reichard (2008) show that the decentralized agencies have been used to

attempt to avoid legal limitations on indebtedness because public administrations can transfer costs and debts out of budget to financial statements of the decentralized agency, formally complying with the fiscal rules and debt limits. [Farnham \(1985\)](#) has shown that more indebted public administrations are more likely to create public corporations after introducing legal limits to public debt, aiming to increase the external financing ([Bennett and D'Iorio, 1982](#)).

The fact that debt limits and the financial situation of local governments are essential determinants of the development of MOC and different forms of outsourcing of public services is well recognized in the literature ([Bel and Fageda 2017](#)). But consequences of that activity on the MOCs' financial condition have not been investigated in the literature so far.

In our paper, we search to answer whether the financial flexibility (current debt and unused debt capacity and cash holdings) of municipal companies depends on the outstanding municipality's debt and debt capacity, constrained by the fiscal debt rule. Our contribution to the literature is an analysis of the impact of the implementation on Polish municipalities the fiscal debt rule on the substitution of municipal debt by the debt of MOC. But we go one step further, and in our study, we make an in-depth analysis of their consequences for municipal companies' financial flexibility. On the one hand, local governments created MOCs because of the opportunity to use them to avoid the debt limits imposed on public finance discipline and fiscal rules, as municipalities would then transfer their debt out of the budget to the MOCs' financial statements. However, on the other hand, MOCs can expect their local public shareholders to compensate for their losses or bail them out. Such expectations may provide managers with incentives not to pursue efficiency or borrow excessively. Hence, this is crucial to learn if Polish municipalities use municipal companies' financial flexibility (leverage, unused debt capacity, cash holdings) to avoid fiscal debt constraints and the effect of such off-balance-sheet financing.

We exploit the natural experiment of effectively introducing more restrictive fiscal debt limits in 2014 by **panel data approach** for data retrieved from Statistics Poland, budget statements of local governments, and municipal companies' financial and ownership data gained from the ORBIS database from 2010 to 2018. Thanks to that, we can observe the financial flexibility of municipal companies in years before (2010-2013), and after (2014-2018) new fiscal rules have been in force, we contribute to the literature by exploiting the natural experiment and providing empirical evidence to assess effects of these budgetary debt constraints. We expect that the tightening of limits on sub-national government debt leads to an expansion of off-budget debt. Assuming no change in the relative cost burden of off-budget

financing total government compared to other funding, municipalities with lower debt capacity¹ can shift debt out of the budget using MOCs' debt (or fees for the provision of local public utilities). Both fee revenues and capital cost influence MOCs' debt capacity by profitability, working capital, and solvency. Therefore, we use the ordinal logit to estimate how far MOC can go in debt till losing rating with the 20% probability. [De Jong, Verbeek, and Verwijmeren \(2012\)](#) and [Fliers \(2019\)](#) previously applied this approach for listed companies excluding utilities. We assess the credit rating using a 7-point rating scale (ranging from AAA to CCC & D) based on the Z''-score function for emerging countries ([Altman and Rijken 2004](#)).

Our results confirm that municipal services corporatization is oriented toward overcoming the indebtedness restrictions imposed on municipalities via off-budget debt raised by MOCs. MOCs' debt has subsidized local public debt constraint by the new restrictive rules. Consequently, tightening fiscal rules related to sub-sovereign indebtedness decrease MOCs' financial flexibility measured by unused debt capacity while increasing their cash holdings. Local governments with lower debt capacity limited by the new fiscal debt rules have higher off-budget debt issued by transport MOCs.

The remainder of this article is structured as follows. In the second part of this paper, we review literature related to fiscal rules on local debt, its reasons, and problems of their effectiveness. Next, we provide a brief overview of Polish local government and MOCs, and we describe the legal rules related to local debt. The third part of the literature review discusses and proposes a new approach to measure MOC's financial flexibility, including unused debt capacity methodology to remedy this issue. Section 4 describes the data sources and research design. In the next part, we present our empirical study. Finally, there are conclusions, limitations, and discussion in Section 5.

2. Literature review

2.1. Fiscal rules as determinants of MOC's creation

Fiscal rules have been the subject of numerous studies, both theoretical and empirical. Most of them focus on the national fiscal rules. But due to the great crisis in 2007-2009, the problem of controlling sub-national debt and spending started to be even more actual. In many countries, new fiscal rules were imposed on sub-central units. For example, in European Union members, in 1990, only four had the numerical fiscal rules for local or regional governments,

¹ distance from current debt repayment burden to the limit of individual debt ratio

while in 2018, such restrictions were in eighteen countries ([“Fiscal Rules Database” 2020](#)). Of particular importance is the effectiveness of the rules, understood as the ability to reduce fiscal imbalances. An essential part of studies related to that problem focuses on American experiences, where limitations on the state deficit’s size are widespread. Studies such as [Poterba \(1994\)](#), [Alesina and Bayoumi \(1996\)](#), [Bayoumi and Eichengreen \(1995\)](#), and [Bohna and Inman \(1996\)](#) suggest that adequately designed rules can effectively reduce budget deficits and debt. In the case of Europe, discussion on the effectiveness of fiscal constraints imposed on sub-national governments was presented, for example in case of studies for Spain ([Delgado-Téllez, Lledó, and Pérez 2017](#)), Germany ([Potrafke, Riem, and Schinke 2016](#)), Italy ([Grembi, Nannicini, and Troiano 2016](#)), Switzerland ([Feld and Kirchgässner 2008](#); [Feld, Kirchgässner, and Schaltegger 2011](#)), Norway ([Hopland 2013](#)) or in international comparisons ([Kotia and Duarte Lledó 2016](#); [Foremny 2014](#); [Wyplosz 2012](#); [Ahmad, Bordignon, and Brosio 2017](#))

The literature distinguished the success or defeat factors of fiscal rules related to local government debt ([Ter-Minassian 2007](#); [1997](#); [Wyplosz 2012](#); [Rossi and Dafflon 2002](#); [Plekhanov and Singh 2006](#)). The rules need to help avoid local-central government bailout game, presented by Inman ([Inman 2001](#)). *“The important is the central government’s commitment to stand by and enforce established rules”* ([Rodden, Eskenland, and Litvack 2003, p. 455](#)). Significantly any bailout precedents erode the effectiveness of borrowing controls. What’s more, empirical evidence suggests that such bailout history negatively impacted local government debt and general government debt ([Martinez-Vazquez and Vulovic 2016](#); [Velasco 2000](#)). Vertical fiscal imbalance (VFI) is a critical factor of debt and local spending increase. The literature presents *“that rules on their own, no matter how strong, may fail to induce fiscal discipline at the subnational level if the level of VFIs is too high”* ([Kotia and Duarte Lledó 2016](#)). But there are countries where despite high VFI, local debt is under control. The smart mix of the market and administrative mechanism of local debt controlling is significant ([Poterba and Rueben 1999](#); [Craig and Kenneth 2005](#)).

Similarly, a cooperative agreement between sub-sovereign governments and the central government helps avoid an imbalance of local budgets ([Martinez-Vazquez and Vulovic 2016](#)). The transfer system’s design based on clearly described general grants ([Rodden, Eskenland, and Litvack 2003, p. 431 and further](#)) is essential. The particular problem in the VFI regime is the adequacy of transfers and local revenues to decentralized expenditures. The lack of sufficient revenues to cover mandated responsibilities may result in increasing local debt and spending. In such a case, fiscal rules may push local governments to different forms of "creative accounting", especially off-balance-sheet financing. Some authors point out that the

effectiveness of fiscal rules can be illusory as conventional measures of the deficit and public debt are not an appropriate measure of their effectiveness (von Hagen 1991). That is why some studies indicate that the effectiveness of the rules is limited. *“In some countries, the application of numerical rules has led to creative accounting practices aimed at circumventing the rules, including reclassification of expenditures, accumulation of arrears, and the use of public entities off-budget to perform government operations”* (Ter-Minassian 2007). This last issue- the determinants of creation and financial condition of MOC- will be a particular subject of analysis in our paper.

Hiding the scale of indebtedness or local expenditures in extra-budgetary forms of activity has been observed in many countries with different local finances’ systems and traditions. For example Bennett and Dorenzo (1982), in their seminal paper, presented that in 70ties in the US *“state limitations on local government taxing and spending powers have resulted in billions of dollars of debt and expenditures placed off-budget - in various off-budget enterprises - and beyond the direct control and scrutiny of taxpayers”*. What’s more, comparing states where new regulations related to local fiscal autonomy were imposed, they found that the MOCs’ debt (not consolidated in the financial statement) is bigger and growing faster than on-budget debt. Many other studies confirm this correlation (i.e., Warner and Hebdon 2001; Marlow and Joufaian 1989; Bifulco et al. 2012). Further research for the US present that the popularity of revenue bonds – which MOCs very often issue - or other forms of off-budget debts issued by MOCs, is strictly related to the limits imposed on general debt (Bunch 1991; Bifulco et al. 2012). The results of the latest studies for some European countries are very similar. For example, in Spain, in the years 2000-2008 number of regional public enterprises increase more than 70%, and it was the ‘shift effect’ caused by the stringent 2001 budgetary stability law (Llera and Garcia Valiñas 2013). The Cuadrado-Ballesteros et al. (2016) study for Portugal presents that more indebtedness municipalities use more off-budget enterprises. In Italy, the growing share in equity (ownership) and control of firms by the municipalities has been defined as “municipal capitalism”, and according to Italian studies, it can help the municipalities to elude the hard budget constraints imposed by the law in 1998 (Boggio 2011; 2012).

As visible, the fact that fiscal rules are essential determinants of the MOCs’ creation is correlated to the financial statement of local government. If the local government’s financial statement is good, fiscal rules are not a problem for them. Therefore they do not have the impulse to look for extra-budgetary forms of activity. However, fiscal imbalances or high local government debt makes the creation of MOCs more likely. Bel and Fageda (2017) presented that in Europe, the recession after 2008 had a substantial, positive impact on different forms of

contracting out. [Andrews et al. \(2020\)](#), in their study for England, found that governments with higher levels of grant dependence and debt dependence are more involved in the creation and operation of companies.

The other factors which may be necessary for the analysis of creation and, more generally, using MOC by local governments are related to the local political scene. Politicians decide to create or not MOC. Therefore, the local political scene and local politicians' characteristics are presented in the literature as an essential determinant „*when deciding the management alternative*” ([Picazo-Tadeo et al. 2012](#)).

Despite mentioned problems, we need to remember that MOC results of different reforms in the local public sector. These reforms try to increase public service and public finance efficiency. The idea of functional or economic decentralization- when the public sector shifts the responsibility for their tasks to private entities is promoted in most textbooks and guidance for governors. In literature, it is presented that the number and size of different contracting-out forms, among them MOC, are positively correlated to the local governors' quality ([Rubin 1988](#); [Warner and Hebdon 2001](#)). There is a lot of empirical analysis that compares the efficiency and effectiveness of public services delivered by local bureaucracies and different forms of MOC and private firms. Those studies generally present that MOC increases the public services' efficiency and effectiveness (see [Voorn, van Genugten, and van Thiel \(2017\)](#) for the latest review of that studies).

We need to remember that most municipal companies operate in socially significant tasks, entered as compulsory self-government tasks. Possible financial problems (risk of default) of companies can bring a real problem for the municipalities. That is why the knowledge of these companies' financial flexibility is needed, but as we present in part 2.3, it is not an easy task.

2.2. Local government and fiscal rules on local indebtedness in Poland

In the 1990s, Poland experienced a transformation in its economy and the decentralization of its public sector. In 1990, municipalities (*gminas*) and, in 1999, counties (*powiats*) and regional governments were established. The biggest cities have county status and operate as both a municipality and a county. Today, Poland is one of the most decentralized countries in Central-East Europe (CEE), and sub-sovereign governments' expenditures account for 30 percent of all public spending ([Swianiewicz 2014](#)).

The most critical sub-sovereign governments are “*gminas*” (2412 units, less one since 2019 when Ostrowice was liquidated because of over-indebtedness) and cities with “*powiat*” status (66 in total, including Wałbrzych that changes its status in the analyzed period). The

municipalities are also relatively diversified by size. However, in Poland, all municipalities, irrespective of citizens' number or the area, undertake the same obligations and are subject to the same revenue sources. These governments are responsible for most vital social and communal services such as primary schools, social protection, primary health, culture, local transport and roads, water and sewage services, and waste management. The cities with county status are responsible for municipal services and county services (additionally for secondary schools, hospitals, etc.).

To finance their obligations, local governments impose local taxes (the same for municipalities and cities) and shared taxes, with land and estate taxation as the most critical local taxes. Local taxes contribute on average only 14 percent to municipal and city budgets. Local governments can decide on the tax rates (below centrally imposed maximum) and tax relief. In the case of shared taxes (on personal and corporate incomes), municipalities receive the fixed percentage of the total proceeds collected in their respective areas; cities receive municipal and county shares. Local governments have no fiscal autonomy with these taxes. Shared taxes, on average, contribute to 14 percent of municipal and 25 percent of city budgets. Municipalities cannot collect taxes other than those set by law by central authorities or impose any surtaxes. Local governments' revenues also consist of administrative fees and charges and revenue from property, leasing, sales, and income gained from public utilities. Those revenues contribute to, on average, 10 percent of municipal and 17 percent of city budgets. The most important part of local budgets is covered by transfers from the central government (on average 60% for municipalities and 42% for cities). The transfers are allocated according to transparent (although often criticized) criteria set by the law. It is not possible to use those transfers to soften local budgets (Swianiewicz 2014). There is an essential variation in the proportion of transfers and own local revenues in local revenues.

In literature, the studies of the effectiveness of the fiscal rules related to local governments and off-budget activity of municipalities usually use comparative analysis. There are two dimensions of comparison used - the spatial differentiation of these rules (between municipalities in one country or internationally) (Kotia and Duarte Lledó 2016; Foremny 2014; Feld and Kirchgässner 2008; Craig and Kenneth 2005) and comparison in time (in the period before and after imposing of new regulations) (Banaszewska 2018; Grembi, Nannicini, and Troiano 2012; Llera and Garcia Valiñas 2013). From the scientific analysis point, we are dealing with a natural experiment in that second approach. Such a change of fiscal rules concerning self-government' debt and deficit took place in recent years in Poland.

In Poland, local governments had the legal possibility to borrow from the beginning of its history in 1990. It was defined that local units can use long-term borrowing (longer than a budgetary year) to cover budget deficit - and it was not explicitly related to investment purposes. But in the first decade, municipalities used this possibility very rarely - the costs of commercial debt were high, the capital market was not ready to prepare long-term debts, and local governors had a negative opinion about indebtedness (Kopańska & Witkowski 2003, p. 99). In 1993 the first rule related to the level of local indebtedness was established – the planned repayment of debt (sum of installments and interests) could not exceed 15% of the local government's revenues. This limit was repeated in Law on Public Finance in 1998, but there were added new regulations. The second limit related to the debt size stated that the total outstanding debt could not exceed 60% of annual revenues. Clear rules which made control of the cost of local debt were also introduced. Local governments' right to borrow in foreign currencies was prohibited, the discount from the issued securities might not exceed 5% of the bond value, and the capitalization of interest was prohibited. Finally, the Law on Public Finance tied local governments' borrowing rights to the national government borrowing practices once the consolidated public debt exceeded 50% of the GDP (Kopańska and Levitas 2004; Swianiewicz 2004).

In 2009, as a part of consolidation policy, the Law on Public Finance was revised, and new regulations related to the local debt were established. Local budgets were divided into operational and investment parts, and starting in 2011, the issue of debt is limited to the investment part of the budget. Additionally, local governments' debt size limits were canceled, and a new rule was added. This new rule relates to the possible extent of debt repayment for every local unit given by the formula presented below (art. 243).

$$\left(\frac{R+O}{D}\right)_n \leq \frac{1}{3} \left(\frac{Db_{n-1} + Sm_{n-1} - Wb_{n-1}}{D_{n-1}} + \frac{Db_{n-2} + Sm_{n-2} - Wb_{n-2}}{D_{n-2}} + \frac{Db_{n-3} + DS_{m_{n-3}} - Wb_{n-3}}{D_{n-3}} \right) \quad (1)$$

where:

R – the total amount of repayment installments of loans, borrowings, and bonds planned for the financial year,

O - planned for the financial year interest on loans and borrowings, and interest of bonds,

D - total revenues of the budget for a given financial year,

Db - current revenues,

Sm - revenues from the sale of a property,

Wb - current expenditures,

n - the financial year for which the relationship is established.

Local governments have received time to prepare for this new limit, and it has started to be obligatory since 2014. It is believed that individual limits better reflect each self-government unit's real situation and protect local governments from over-indebtedness, but there is an essential discussion about the details of new regulations (i.e., [Marchewka-Bartkowiak and Wiśniewski 2012](#); [Poniatowicz 2011](#)). Those limits seem to be more restrictive. According to the RIO (Regional Accounting Chamber) calculations, at the end of the old rules (late 2013), only in 135 out of 2809² self-government units, the new limits would be more favorable if they were already in force in 2013 ([RIO 2014](#)). That is why in our paper, we will focus on that last rule.

Besides, from the beginning of the 1990s, local governments (and especially municipalities and cities) in Poland could use various organizational forms - budgetary and off-budgetary - to provide their services. During the first years of transformation in Poland, the former state enterprises delivering public services (about 800) were transferred to municipalities with all their assets ([Regulski 2003](#); [Aziewicz 1998](#)). These enterprises *“were typically responsible for an extremely heterogeneous bundle of functions. The finances of these multi-branch enterprises were extremely unclear and characterized by large amounts of cross-subsidization. Moreover, they had extremely low inventories and valuations of their assets”* ([Levitas 1999](#)). What is even more interesting, during the process of “corporatization”, municipalities also received several profit-oriented enterprises. Until today municipalities have the right to engage in economic activities that are restricted to their public responsibilities. These transferred enterprises operated under the Law on the State-Owned Enterprises, but municipalities were obligated to transform them to a company - MOC (private law entity) or local budgetary establishment (public law entity). Municipalities may also decide about the creation of new forms of service delivery:

- public - direct delivery of services by a municipality and municipal establishment or local budgetary establishment, or
- private - by MOC, but also contracting services to private entities.

In 2000, after ten years of transformation there were operated 2292 local budgetary establishments and about 1345 MOCs where a municipality is solely or the principal owner ([MSP 2002](#)). The popularity of MOCs increases every year, and in 2009 there were more than 2100 MOCs. Most of them operated in the sewage and water sector (about 26%) and communal

² Some municipalities were consolidated and included into a bigger municipality (city) or liquidated (i.e., Ostrowice), and finally in 2019 there were 2477 self-government units in Poland.

housing (21%) (MSP 2010). As was noticed, in Poland, MOCs are not subject to consolidation under public finance law. Their debt is not included in the local public debt, nor is it limited by the fiscal debt constraints. The presence of limits on sub-national government debt is expected to expand off-budget activity and debt. When we assume no change in the relative cost burden of off-budget financing vis-a-vis other means of funding, lower municipal debt capacity should be associated with more significant usage of off-budget financing (via MOCs). During the analysis, we verify the following hypotheses:

H1: *The more indebted a local government is, the more it feels the need to seek additional debt financing beyond the fiscal debt constraints. Therefore, the introduction of the fiscal debt rule increases the municipality's off-budget debt through municipally-owned companies.*

H1A: *There is a substitution between municipal budget debt and off-budget debt (the share of municipal companies' debt in the total budget and off-budget debt of the municipality).*

Some Polish studies and reports notice hiding the local governments' public debt by shifting it to MOCs (i.e., Babczuk, 2012; Kata, 2015; Pokrywka, 2013; Poniatowicz, 2011b; RIO, 2014; Swianiewicz & Łukomska, 2014). The critical weakness of all these analyzes for Poland is that most of them were carried out on case data (limited, biased samples) and based on estimated volumes. Our study avoids that problem.

2.3. Financial flexibility of municipally-owned companies

According to international and Polish studies, assessment of municipal companies' performance is not an easy task. On the one hand, we need to use the classic tools of ratio analysis of the company, but on the other hand, we do not deal with ordinary enterprises. Therefore, maybe we should treat MOCs like local government units and apply measures dedicated to such special units acting under fiscal pressure and public finance discipline. The financial condition of local government units has been studied mostly for US municipalities (i.e., Kloha, Weissert, and Kleine 2005; Crosby and Robbins 2013; Wang et al. 2007; Hendrick 2004). But there are also studies for other countries (i.e., Zafra-Gómez, López-Hernández, and Hernández-Bastida 2009; Chapman, Gakuru, and de Klerk 2003; Cohen et al. 2012; Bolívar et al. 2016; Lara-Rubio et al. 2017; Kluza 2017) and Poland too (Jastrzębska 2009; Bieniasz, Gołaś, and Łuczak 2013; Filipiak 2016; Kluza 2017). Some researchers discuss the financial condition in the context of detecting the default risk of local government units. In the literature, these are called "fiscal distress", "financial risk", "fiscal crisis", or "fiscal strain" or financial/fiscal condition or health. The fact that there are so many names for that problem is

related to the difficulty of defining and measuring it (Stanny and Strzelczyk 2017). Most broadly, the financial condition of local government unit could be defined “*as a government’s ability to finance its services continuingly, including a government’s ability to maintain existing service levels, to withstand systematic and unsystematic risk, and to meet the demands of natural change over time*” (Rivenbark, Roenigk, and Allison 2010). This approach to assessing MOCs is supported by (Vining, Boardman, and Moore 2014). That noticed that “their primary goal should be to improve social welfare” as in case of governments. However, at the same time as the entrepreneurs, the MOCs need to maximize profits (Vining, Boardman, and Moore 2014). Barwacz and Koziol (2014) pointed out this duality and contradiction.

What is more important to notice is that municipal companies (regardless of their organizational form) operate in specific - market-failures circumstances. MOCs are usually natural monopolies, often strengthened by privileged positions through the so-called order in-house. That is why MOCs are often accused of unfair competition or public aid (subsidies) (Barwacz 2015). The other problems are externalities generated by communal services. In practice, it means that very often, these municipal companies’ activity is quite strictly regulated by law (this is the case in environmental sectors - water and sewage, energy, heating, garbage collection).

Therefore, it seems reasonable to focus on financial flexibility instead of performance as central to solvency and growth opportunity. There are different definitions of corporate financial flexibility in the literature. Firstly, it can be understood as the ability of a company to respond to financial frictions. In such cases, the company can maintain its independence and cope with situations that usually cause a decline in financial performance. At the same time, financial flexibility enables a firm to manage its financial resources in such a way as to maintain its operation unchanged in situations threatening the loss of liquidity. Such actions require particular care in making decisions that will protect the company against possible difficulties and prevent it from issuing debt.

In addition to dealing with crises, a firm should also demonstrate its ability to realize growth opportunities. As a matter of principle, every firm seeks to make the most efficient use of its resources while maintaining an optimal productivity level to achieve the highest possible profits. Firms need to build up their investment capacity to grow and strengthen their position. MOCs’ investment capacity depends on financial flexibility, which translates into the shape of the leverage, i.e., the debt the company can afford to finance growth opportunities. Therefore, it is necessary for a firm to analyze and evaluate its financing sources, examining the efficiency of equity in relation to the debt incurred. Debt capacity, which refers to such a relationship, is

one of the measures of financial flexibility. It indicates how much debt a company can still take on to maintain liquidity and investment rating. In turn, cash holdings make a MOC immune to unexpected changes in the cost of capital and restrictions on access to debt.

There are various measures of financial flexibility in the literature. One of them is *unused debt capacity*, defined in terms of debt capacity buffer as the difference between a company's debt capacity (ability to repay the debt) and its current debt ratio. [Hess and Immenkötter \(2014\)](#) point to the crucial companies' objective to maintain financial flexibility through capital structure changes (debt ratio). They confirm that firms increase their leverage only if the debt capacity is high enough to keep the target rating after issuing corporate bonds or buy-back operations. Otherwise, companies choose to issue equity to restore their financial flexibility. This relationship shows that debt capacity plays a vital role in financial decision-making. Liquid reserves indicate investment potential (readiness to realize growth opportunities) and hedge against financial frictions (probable difficulties in obtaining financing in the credit market).

[Marchica and Mura \(2010\)](#) attribute equal importance to unused debt capacity, considering it a key element in creating an optimal capital structure. The authors point out that companies that have followed a conservative debt policy can invest more in the future by maintaining cash reserves. Such actions make companies financially flexible, so they can afford to increase capital expenditures after a certain time. Moreover, it has been studied that the effect of keeping unused debt capacity results in 37% higher capital expenditures than for firms that are not creditworthy. [De Jong, Verbeek, and Verwijmeren \(2012\)](#) indicate that the companies' action aims to maintain sufficient financial flexibility to finance growth opportunities (future investment projects). In this case, the unused debt capacity's measure is the difference between the maximum hypothetical indebtedness (at which the company has not yet lost its rating) and its actual debt ratio. Furthermore, [De Jong et al. \(2012\)](#) confirm the significant financial flexibility's impact on capital structure. This is because low leverage during periods of favorable financing conditions promotes easier access to debt. This means that firms can forgo taking on debt in such a situation to be better prepared to make critical investments in periods with limited debt financing opportunities. Companies are adopting conservative debt policies to preserve their liquidity and incur lower costs in times of crisis. Apart from they noticed a higher number of companies that take on debt in periods of turbulence and financial frictions, but which previously had high unused debt capacity, they did not notice the relationship between the debt issued and financial flexibility. In other words, companies that had higher financial flexibility did not take on more debt than companies with less debt capacity.

The literature review shows that unused debt capacity and cash holdings effectively measure financial flexibility. Thus, firstly, we focus on the debt capacity because this is the starting point for calculating the unused debt capacity, expressed as the difference between debt capacity and the debt ratio in year t . The MOCs' debt capacity, i.e., their ability to meet their obligations, is estimated based on an investment rating, indicating which company's financial state is. Investment ratings are usually assigned to public companies listed on the stock exchange, as widespread access to their financial information makes it possible to assess investment risk. Rating agencies or financial institutions, e.g., StockWatch in Poland, estimate potential financial risks of selected companies based on financial statements. Access to the data needed to determine the rating is a problem in MOCs because they are limited liability companies that are not obliged to publish their financial statements. There are also no publicly available MOC's credit ratings, which require continuous monitoring of the companies' performance for updating the assigned ratings. Therefore, for our study's purpose, we decided to use the Z"-score discriminant function developed by Altman for emerging markets. Altman's Z"-score using four financial ratios, i.e., working capital, retained earnings, EBIT, and debt to equity ratio, was used to assign an investment rating to each of the municipal companies. Altman's discriminatory model is reliable because its construction helps obtain a credible assessment. The calculation scheme is widely used, e.g., by StockWatch for companies listed on the Warsaw Stock Exchange. Additionally, the research results confirm the Z-score model validity for the Polish market, especially its usage by banks and other financial institutions. [Altman, Iwanicz-Drozdowska, Laitinen, and Suvas \(2017\)](#) confirmed that Altman's discriminant function Z"-score accurately estimates the Polish companies' default risk comparing with other bankruptcy prediction models as well as other countries (the sample includes data of companies from 31 countries).

We calculate credit rating based on Z''-score, proposed by [Altman and Rijken \(2004\)](#) for emerging markets, as $Z''\text{-score} = 3,25 + 6,56 WC/TA + 3,26 RE/TA + 6,72 EBIT/TA + 1,05 BVETD$, where: WC - working capital, TA - total assets, RE - retained earnings, EBIT – earnings before interests and tax, BVETD = book value of equity / total long-term debt.

If the $Z''\text{-score} > 8.15$, rating equals to AAA; for $Z''\text{-score} > 7$ – AA; when $Z''\text{-score} > 6.4$ – A; if $Z''\text{-score} > 4.5$ - B+; if $Z''\text{-score} > 4.15$ – B; $Z''\text{-score} > 2.5$ - CCC and if $Z''\text{-score} < 2.5$ – rating equals to D.

Debt capacity is the maximum amount that a municipal company can borrow, incur, and repay. Therefore it reflects financial flexibility and liquidity in the sense of service actual and potential (future if needed) debt. Debt capacity (dc) is the value for debt ratio (dr_i) that results

in a probability of $p\%$ of receiving a speculative rating (B, CCC or D in the 7-point rating scale (from AAA to D)) (Fliers 2019; de Jong, Verbeek, and Verwijmeren 2012). From the perspective of financial flexibility, a firm reserves debt capacity to fund future investment opportunities or limit the under-investment problem associated with high leverage. We estimate the firm's debt capacity (dc) by determining the expected value of rating y_i^* conditional on the firm's characteristics, current rating, debt ratio, and by comparing this with the threshold γ_3 . We derive the measure for debt capacity by solving

$$dc_{p,i} = \frac{\gamma_3 - x_i' \alpha_2 + \lambda_i - F^{-1}(p)}{\alpha_1} \quad (2)$$

We assume that ϵ_{it} follows an F-distribution with $F^{-1}(\cdot)$ as its inverse. Next, we estimate a firm credit rating y_i as follows:

$$y_i^* = \alpha_1 dr_i + x_i' \alpha_2 + \epsilon_i \quad (3)$$

where y_i^* is the latent variable, x_i is a set of firm characteristics including total assets, sales, leverage measured by BVETD, EBIT ratio, retained earnings, working capital, and dr_i is the firm's debt ratio. We use a 7-point rating scale (ranging from AAA, AA, A, B+, B to CCC & D) following Ashbaugh-Skaife et al. (2006). The ordinal logit model provides the boundaries (γ) between the different credit ratings. A credit (investment-grade) rating corresponds to a point where $y_i \geq 4$ and $y_i^* = \gamma_3$.

Finally, we calculate how much a firm can borrow till it reaches a high default risk and loses an unspeculative "safe" rating (at least B+). At this frontier, costs of debt become high and, next, quickly increasing. The maximum level of debt – debt capacity - reaching before this hypothetical frontier allows us to calculate unused debt capacity as the difference between the debt capacity ($dc_{p,i}$) and the debt ratio (dr_i) at time t as proposed by Fliers (2019):

$$udc_{p,i} = dc_{p,i} - dr_i = \frac{\gamma_3 - x_i' \alpha_2 + \lambda_i - F^{-1}(p)}{\alpha_1} - dr_i \quad (4)$$

where λ_i is the generalized residual for individual firms and is positive for firms with unexpectedly high credit ratings. We follow Fliers (2019) and assume that $p=0.2$. As this cut-off point, one can also use the point beyond which distress (default) probabilities increase significantly or the point beyond which external financing costs increase rapidly (Fliers 2019).

Contrary to the United Kingdom, New Zealand, Australia, Sweden, and Spain, in Poland, MOCs are not subject to consolidation under public finance law. Therefore municipalities can transfer their debt to the dependent MOCs, which prepare their separate financial statements. Thus, municipalities could use MOCs to increase municipal debt without increasing local public debt because they add neither to the consolidated budget nor the general

account. Moreover, their debt capacity is not limited by the fiscal debt constraints because they are regulated by the Commercial Companies Code, the same as other private firms, not by the public finance law. These make MOCs unique in terms of debt issuance, contrary to their owners. Taking into account the above arguments, we establish the following hypotheses:

H2: *Local governments with lower debt capacity constrained by the fiscal debt rule (with a lower individual debt ratio) have higher off-budget debt (issued by municipal companies).*

H3: *Tightening of fiscal rules related to sub-sovereign indebtedness decreases municipally owned companies' financial flexibility (unused debt capacity and cash holdings).*

3. Research Design

This paper aims to verify whether local governments use MOCs to avoid fiscal debt limits set by public finance law. And if they do, what are the effects of this off-budget indebtedness on municipal companies' financial flexibility?

To achieve the goal, we used a unique database obtained from the ORBIS database for Polish MOCs for the years 2010-2018. Thanks to that, we can observe municipal companies' financial flexibility in years before (2010-2013), and after (2014-2018), new fiscal rules have been in force. We did not consider companies from the health care and energy industries because local governments have little ability to influence them due to their specific nature. Additionally, to obtain the correct panel model, we limited our attempt to companies that have appeared in the database at least three times. Finally, our database contains data for unique 1294 enterprises owned by 756 municipalities, but their number is different in different years (see [Table 1](#)). Four hundred fifty-six municipalities have five annual observations or more in the database and that own 970 enterprises. We will use that more balanced subsample in our analysis for robustness checks of econometric models (the last two columns in [Table 6](#) for the *sde* dependent variable, and [Tables 10-13](#) for all MOCs' financial flexibility measures.

Table 1. Number of municipally-owned companies and municipalities in years 2010-2018

year	Number of enterprises	Number of municipalities
2010	966	553
2011	1010	577
2012	1070	625
2013	1071	641
2014	1114	671
2015	1135	681
2016	1127	674
2017	1251	724
2018	1226	713

Source: own calculation based on ORBIS data.

As can be seen in [Table 1](#) number of MOCs is growing every year till 2017. Generally, changes in that number are mostly related to the fact that municipalities established new firms. According to the descriptive statistics presented in [Table 2](#) (*nm_e* variable), each local government created an average of two (in the median – one) MOCs during the analyzed period. Fewer MOCs were established before 2014 when a new debt limit was introduced (2010–2013). Nevertheless, the number of MOCs and municipalities that own any municipal company increased in the subsequent period (2014–18), when the new debt limit was in force. These descriptive results support the corresponding explanatory results.

That observation may prove that the off-budget activity of Polish municipalities is growing. But to analyze that problem in more details, we defined variables *sde* and *sdm*, where

$$sde = de / (de + dm); \quad sdm = dm / (de + dm)$$

sde - the share of enterprises debt in total municipal debt,

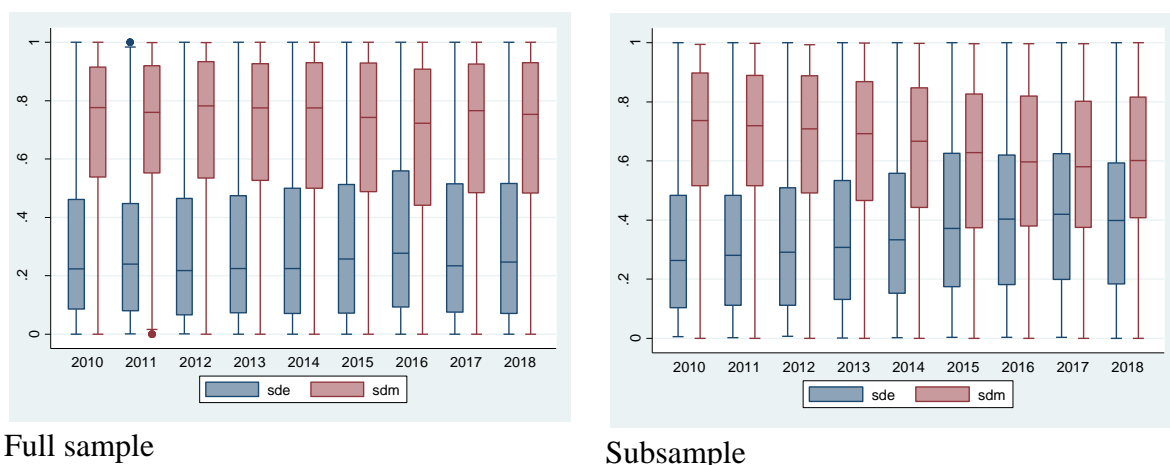
sdm - the share of municipalities debt in total municipal debt,

de - indebtedness of communal enterprises,

dm - indebtedness of the municipality.

[Figure 1](#) presents changes in *sde* and *sdm* over the years for the full sample of municipalities and subsample. It is visible that the share of debt of communal enterprises grow and after 2014- when the new debt limit come to force, *sde* is higher than before, while *sdm* smaller. This trend is evident in subsample - this is because we can observe the stable group of municipalities there.

Figure 1. Shares of MOCs' debt in total municipal debt in years 2010-2018



Source: Own calculation base on Bureau van Dijk's Orbis database and budgetary data.

Fig. 1 supports a story on substitution between sub-national debt by off-balance-sheet financing by debt issued by MOCs. To check if the above conclusion is statistically significant, we analyzed the panel data model, where *sde* was explained by variables that illustrate the financial condition - which, as noted in the literature review, is an essential factor in creating MOCs. We define that financial condition by four variables- municipal operational revenues per capita (*lnrevo_pc*), level of municipal indebtedness (*debt_rev*), the capacity of incurring debt resulting from the debt limits (*udc_m*), and dependency of local budgets on grants (*FG*). The panel data approach provides more robust results than cross-sectional studies by controlling for unobservable heterogeneity and correcting endogeneity problems between dependent and independent variables. The key test variable (the *limit* dummy variable) identifies years before and after new limits come to force. We controlled election years using the *elect* dummy variable. A local political scene may be an important factor for MOC's creation. Previous studies have shown that MOCs have emerged as an attractive source of revenue that might foster the total or partial recovery of the cost of the service provided by charging the user directly, without having to raise taxes or local fees on all inhabitants (Molinari and Tyer 2003; Rubin 1988; Tyer 1989). The creation of MOCs represents the increase in decentralization processes. Therefore, we control the numerical variable that identifies the MOCs created in each municipality (*nm_e* variable). Table 2 provides definitions and describes statistics of variables used in analysis at both municipality and MOC level.

Table 2. Basic information and statistics of the variables at municipality and MOC level

variable	definition	Full sample			Sub-sample		
		mean	p50	cv	mean	p50	cv
Variables for analysis at municipality level							
<i>sde</i>	the share of municipally-owned enterprises debt in total municipal debt	0.32	0.25	0.85	0.37	0.34	0.70
<i>nm_e</i>	number of municipally owned companies-subsidiaries of municipality <i>i</i>	1.91	1.00	0.74	2.23	2.00	0.70
Variables for analysis for municipalities and MOC							
<i>lnrevo_pc</i>	the operational revenues of municipality per capita (logarithmized in model)	3493	3242	0.54	3400	3162	0.35
<i>FG</i>	indicator of fiscal gap - share of grants from central budget in municipal revenues	0.41	0.40	0.31	0.39	0.38	0.30
<i>debt_rev</i>	indicator of municipal debt measured as the total debt divided by total revenues	0.32	0.32	0.53	0.33	0.32	0.49
<i>udc_m</i>	unused debt capacity of the municipal budget - the difference between debt servicing expenditure and allowable debt capacity under the new debt limit	-0.03	-0.03	-3.26	-0.02	-0.02	-3.07
<i>elect</i>	dummy variable, which is equal to 1 in years of election (2010, 2014, 2018) and 0 otherwise						
<i>limit</i>	dummy variable equals 0 in years before new limits come to force (2010-2013) and 1 in years when new limits were in fore (2014-2018)						

Variables for analysis at MOC level							
<i>flexibility - udc_e</i>	financial flexibility of MOC measured by: <i>unused debt capacity</i> defined in equation (4)	0.21	0.19	3.87	0.17	0.16	4.63
<i>flexibility - dc_e</i>	financial flexibility of MOC measured by <i>-debt capacity</i> defined in equation (3)	0.57	0.52	1.38	0.55	0.52	1.39
<i>flexibility - cash_e</i>	financial flexibility of MOC measured by <i>-cash</i> hoarded by a MOC to its total assets	0.11	0.06	1.22	0.11	0.06	1.20
<i>flexibility - lever_e</i>	MOC's financial flexibility measured by debt ratio (leverage)	0.36	0.34	0.63	0.38	0.36	0.59
<i>size</i>	total assets of MOC (logarithmized in model)	69M	19M	4.17	81M	24M	3.91
<i>roa</i>	net income / total assets – a return on assets ratio of MOC	0.02	0.01	2.17	0.02	0.01	2.11
<i>growth</i>	MOC's total revenue in year <i>t</i> divided by its total revenue in year <i>t-1</i>	25.58	1.02	39.62	26.04	1.02	39.03
<i>age</i>	number of years of MOC's activities (logarithmized in model)	19.12	17.00	0.86	20.98	18.00	0.82

Source: Own calculation base on Bureau van Dijk's Orbis database and budgetary data.

In 2009, the government set significant limitations on local governments' debt capacity, which have become effective since 2014. Thus, to determine whether this law encourages municipalities to search for off-budget debt issue opportunities, based on the hypotheses H1 and H1A posited in the previous section, we have included the *limit* and the *debt_rev* variables in the following model:

1) at municipality level:

$$sde_{it} = \beta_0 + \beta_1 \ln revo_pc_{it} + \beta_2 FG_{it} + \beta_3 debt_rev_{it} + \beta_4 udc_m_{it} + \beta_5 elect_{it} + \beta_6 limit_{it} + \beta_7 nm_e_{it} + \varepsilon_{it} + u_{it} \quad (5)$$

where:

i - indicates the municipality,

t - refers to the time,

$\beta_0, \beta_1, \dots, \beta_7$ - are the parameters to be estimated,

ε_{it} - represents the persistent unobserved heterogeneity,

u_{it} - represents the classic disturbance term.

2) at municipally-owned company level:

$$flexibility_{jt} = \beta_0 + \beta_1 size_{jt} + \beta_2 roa_{jt} + \beta_3 growth_{jt} + \beta_4 age_{jt} + \beta_5 \ln revo_pc_{jt} + \beta_6 FG_{jt} + \beta_7 debt_rev_{jt} + \beta_8 udc_m_{jt} + \beta_9 elect_{jt} + \beta_{10} limit_{jt} + \varepsilon_{jt} + u_{jt} \quad (6)$$

where:

flexibility – represents different measures of MOC's financial flexibility: unused debt capacity *udc_e*, debt capacity *dc_e*, cash holdings *cash_e*, and debt ratio *leverage_e*,

j - indicates the municipally-owned company,

t - refers to the time,

$\beta_0, \beta_1, \dots, \beta_{10}$ - are the parameters to be estimated,

ε_{jt} - represents the persistent unobserved heterogeneity,

u_{jt} - represents the classic disturbance term.

To test hypotheses H2 and H3, we have established the financial flexibility measures as explained variable. We take into account the opportunity to utilize off-balance-sheet financing through debt issued by MOCs. Therefore, we analyze the financial flexibility (debt ratio (leverage), debt capacity, and their differential - unused debt capacity) of MOCs. Unused debt capacity udc_e variable measures a distance of the firm's debt ratio to the firm's debt capacity estimated by the ordinal logit model. Debt capacity measures how much a firm can borrow safely over the frontier of high default risk that occurs when the firm loses a "safe" rating (at least B+), i.e. when costs of debt are high and increasing.

We have used the udc_m and the $limit$ variables defined in Table 2 as test variables. Control variables considered in the analysis (described in Table 2) refer to MOC's characteristics (size, profitability, growth opportunity, and firm age) and the financial condition of a municipality ($lnrevo_pc$, FG , $debt_rev$, udc_m) that is the shareholder of this municipal company.

Since the functional form of the estimated models have the structure described by equations (5) and (6), we will use the significance and sign of the β coefficients standing by the respective variables to verify the hypotheses. Table 3 presents the expected directions of relationships for the confirmation of the research hypotheses.

Table 3. Expected signs at β coefficients used to verify hypotheses

Hypothesis	Test variable	Coefficient	Expected sign	Explained variable
H1	$limit$	β_6	+	sde
H1A	$debt_rev$	β_3	-	sde
H2	udc_m	β_8	-	$leverage_e$
H3	$limit$	β_{10}	-	udc_e
H3	$limit$	β_{10}	-	$cash_e$

4. Results

Table 4 presents panel regression analysis where the share of MOCs' debt in total municipal debt is explained by the indicators of municipalities' financial condition. We control the years after these fiscal debt rules related to the new fiscal rules (a new individual debt ratio) were in force. We take into account also the local electoral cycle. As can be seen, the municipality's

off-budget debt gained through MOCs share in total municipal debt (*sde*) is statistically higher when new fiscal debt limits were in force. This finding is in line with the H1 hypothesis. A negative coefficient at the *debt_rev* confirms the substitution between municipal budget debt and off-budget debt, supporting the H1A hypothesis.

Table 4. Regression results for *sde*

	hypothesis	full sample			subsample – robust check				
		<i>sde</i> re		<i>sde</i> fe	<i>sde</i> re		<i>sde</i> fe		
lnrevo_pc		0.004 (0.22)		-0.021 (1.00)		-0.038 (1.66)	*	-0.048 (1.82)	*
FG		-0.067 (1.64)		0.111 (2.14)	**	-0.049 (0.84)		0.032 (0.45)	
debt_rev	H1A	-0.476 (7.70)	***	-0.448 (7.54)	***	-0.588 (14.07)	***	-0.563 (12.35)	***
udc_m		-0.041 (0.81)		-0.013 (0.25)		0.029 (0.56)		0.066 (1.17)	
elect		-0.013 (4.35)	***	-0.011 (3.99)	***	-0.018 (6.03)	***	-0.018 (5.71)	***
limit	H1	0.033 (5.97)	***	0.04 (7.25)	***	0.044 (6.02)	***	0.047 (6.35)	***
nm_e		0.057 (11.60)	***	0.049 (7.34)	***	0.048 (9.07)	***	0.048 (6.70)	***
_cons		0.324 (2.08)	**	0.47 (2.85)	***	0.766 (4.51)	***	0.807 (4.12)	***
R2_within		0.22		0.23		0.28		0.28	
R2_between		0.28		0.21		0.30		0.28	
R2_overall		0.28		0.23		0.29		0.28	
Number of groups		756		756		456		456	
Number of observations		5,811		5,811		4,055		4,055	

* p<0.1; ** p<0.05; *** p<0.01; z statistic in brackets

The lower the municipal debt to revenue ratio, the higher the share of MOCs' debt in total (budget and off-budget) municipal debt. This outcome means that restrictive fiscal debt constraints make municipalities shift the indebtedness out of the budget via debt issued by MOCs. On the contrary, the local electoral cycle leads to decreased MOCs' debt share in total municipal debt. It happens because governors reduce off-budget debt in the years of local elections. Their behavior can be explained by a loosening of fiscal discipline that leads to the relative increase in budgetary debt. This is because political competition in mayoral elections harms fiscal balances. Tighter elections lead to the loosening of fiscal discipline to gain more votes. However, after winning the local election mayor has more space for tax cuts by increasing off-budget debt. Control variables support our expectations providing that the more MOCs municipality owns, the higher debt is shifts off-budget.

Table 5 shows that decentralization through MOCs increases transport municipal companies' debt in public administrations with lower unused debt capacity. There is no basis

to reject the H2 hypothesis in the transport industry. Older, bigger sized, less profitable, with higher growth opportunities MOCs, acting in more indebted municipalities with less operating revenues per capita, are more indebted. Water service MOCs owned by municipalities with a higher fiscal gap are more indebted in opposition to real estate and construction MOCs.

Table 5. Regression results for debt ratio (leverage) of municipally-owned companies

	total		water		real estate & constructions		transport	
	re lever	fe lever	re lever	fe lever	re lever	fe lever	re lever	fe lever
size	0.178 *** (9.60)	0.266 *** (6.06)	0.162 *** (6.87)	0.279 *** (4.25)	0.179 *** (6.39)	0.224 *** (3.81)	0.254 *** (5.25)	0.394 *** (4.45)
ROA	-0.241 *** (3.96)	-0.264 *** (3.64)	-0.169 * (1.78)	-0.225 * (1.85)	-0.319 *** (3.08)	-0.309 *** (2.91)	-0.342 *** (3.54)	-0.368 *** (3.01)
growth	0.000 (0.44)	0.000 (0.39)	0.000 *** (4.90)	0.000 *** (3.26)	0.000 * (1.75)	0.000 * (1.78)	0.0000 (1.14)	0.0000 (1.74)
age	0.046 ** (2.14)	0.036 (1.05)	0.023 (1.01)	0.03 (0.75)	0.1 * (1.68)	0.047 (0.46)	0.107 (1.52)	0.098 (0.81)
lnrevo_pc	-0.039 *** (2.92)	-0.038 ** (2.13)	-0.004 (0.23)	-0.013 (0.56)	-0.151 *** (5.87)	-0.105 *** (2.82)	-0.09 (1.63)	-0.01 (0.14)
FG	0.039 (1.24)	-0.039 (1.04)	0.083 ** (2.03)	-0.015 (0.31)	0.023 (0.44)	-0.107 * (1.74)	0.14 (1.08)	-0.135 (0.89)
debt_rev	0.043 ** (2.16)	0.039 * (1.80)	0.038 (1.61)	0.026 (1.01)	0.016 (0.39)	0.024 (0.57)	0.054 (0.84)	0.104 (1.61)
udc_m_	-0.01 (0.61)	-0.022 (1.32)	-0.002 (0.10)	-0.021 (1.17)	-0.024 (0.52)	-0.046 (0.99)	-0.111 (1.32)	-0.158 ** (2.43)
elect	0.001 (0.65)	0.002 (1.09)	0.002 (0.99)	0.004 (1.59)	0.002 (0.68)	0.002 (0.6)	-0.004 (0.59)	-0.003 (0.36)
limit	0.007 * (1.82)	0.000 (0.09)	0.022 *** (4.31)	0.009 *** (1.57)	-0.016 ** (2.43)	-0.023 *** (3.33)	0.016 (1.01)	-0.01 (0.6)
_cons	-0.676 *** (5.28)	-1.285 *** (4.62)	-0.906 *** (5.64)	-1.646 *** (4.18)	0.317 (1.45)	-0.279 (0.66)	-0.9 ** (2.23)	-2.495 *** (3.18)
R2 within	0.19	0.19	0.2	0.22	0.24	0.25	0.27	0.29
R2between	0.03	0.03	0.02	0.02	0.11	0.08	0.18	0.17
R2 overall	0.04	0.04	0.04	0.03	0.1	0.08	0.15	0.14
N groups	1,294	1,294	786	786	351	351	112	112
N observ.	9,906	9,906	6,041	6,041	2,597	2,597	871	871

* p<0.1; ** p<0.05; *** p<0.01; z statistic in brackets

Table 6 presents panel regression analysis where MOCs' financial flexibility is explained by its ultimate shareholder (local government) financial condition of with a particular focus on the municipality's debt capacity - related to the new fiscal rules (a new individual debt ratio). We control the years after these fiscal debt rules were in force. We take into account also the local electoral cycle. Our database contains information about 1294 municipally-owned companies, including 786 firms that provide water and waste management services, 351 firms acting in the real estate and construction industry, and 112 transport companies.

Results are shown in Table 6 and confirm that tightening fiscal rules related to sub-sovereign debt reduces MOCs' unused debt capacity. Although this outcome gives no reason to reject the H3 hypothesis, we can notice that the lowest negative impact of the fiscal debt constraints occurs in the water and waste management industry. On the contrary, the local

election cycle effect is insignificant except for the fixed effects estimator applied to the total sample. Larger MOCs have lower unused debt capacity, while more profitable and older MOCs, and MOCs with higher growth opportunities, operating in the water and transport industry have higher unused debt capacity. Transportation MOCs owned by municipalities with less operating revenues per capita have lower unused debt capacity than MOCs from water, real estate, and construction industries. MOCs that provide water in municipalities with higher fiscal gap have less unused debt capacity. In comparison, water and transport MOCs acting in more indebted municipalities have higher unused debt capacity.

Table 6. Regression results for unused debt capacity of municipally-owned companies

	total		water		real estate & constructions		transport	
	re udc	fe udc	re udc	fe udc	re udc	fe udc	re udc	fe udc
size	-0.18 *** (4.27)	-0.29 ** (2.54)	-0.209 *** (5.27)	-0.236 (1.44)	-0.231 *** (2.77)	-0.42 * (1.81)	-0.173 (1.01)	-0.4 (1.2)
ROA	8.531 *** (28.01)	8.474 *** (26.2)	8.427 *** (21.37)	8.573 *** (18.73)	8.907 *** (12.21)	8.729 *** (11.76)	9.19 *** (12.57)	9.254 *** (12.28)
growth	0.000 (0.72)	0.000 (0.79)	0.000 *** (3.31)	0.000 (1.42)	0.000 (0.32)	0.000 (0.68)	0.001 *** (13.63)	0.001 *** (13.33)
age	0.186 *** (3.19)	0.077 (0.60)	0.251 *** (6.02)	-0.168 (1.28)	0.263 (1.23)	0.675 (1.34)	0.127 (0.4)	0.586 (1.04)
lnrevo_pc	-0.136 *** (3.31)	-0.07 (1.03)	-0.103 *** (2.88)	-0.056 (0.78)	-0.202 * (1.74)	-0.53 *** (2.66)	0.531 ** (2.19)	0.662 ** (1.99)
FG	0.146 (1.33)	0.022 (0.15)	-0.287 *** (2.85)	-0.041 (0.26)	0.273 (0.95)	0.602 (1.52)	-0.062 (0.09)	-0.76 (1.01)
debt_rev	0.069 (0.9)	0.09 (1.00)	0.157 ** (2.37)	0.199 ** (2.36)	-0.189 (0.85)	-0.37 (1.42)	0.44 * (1.90)	0.356 (1.44)
udc_m_	0.061 (0.95)	0.041 (0.64)	0.044 (0.66)	0.009 (0.15)	0.275 (0.91)	0.358 (1.12)	-0.22 (0.81)	-0.2 (0.85)
elect	-0.013 (1.36)	-0.02 * (1.78)	-0.005 (0.53)	-0.012 (1.14)	-0.035 (1.61)	-0.04 (1.52)	-0.037 (0.88)	-0.03 (0.81)
limit	-0.063 *** (3.46)	-0.05 ** (2.48)	-0.064 *** (4.10)	-0.013 (0.63)	-0.123 ** (2.39)	-0.08 (1.44)	-0.064 (0.81)	-0.13 * (1.95)
_cons	2.206 *** (5.85)	2.596 *** (3.18)	2.405 *** (6.79)	2.568 ** (2.32)	2.908 *** (3.92)	6.367 *** (3.78)	-3.746 * (1.78)	-3.45 (0.96)
R2 within	0.24	0.24	0.31	0.32	0.16	0.16	0.29	0.3
R2 between	0.22	0.2	0.48	0.34	0.11	0.08	0.03	0.01
R2 overall	0.22	0.21	0.4	0.33	0.13	0.1	0.12	0.08
N groups	1,294	1,294	786	786	351	351	112	112
N observ.	9,906	9,906	6,041	6,041	2,597	2,597	871	871

* p<0.1; ** p<0.05; *** p<0.01; z statistic in brackets

Empirical evidence in [Table 7](#) shows that tightening of fiscal rules related to sub-sovereign indebtedness decreases MOCs' debt capacity, in line with the **H3** hypothesis. Again, the lowest negative impact of the fiscal debt constraints occurs for MOCs operating in the water and waste management industry. The local election cycle effect is significant only for the fixed effect estimator applied to the total sample. The observed relationship is negative. Larger MOCs that provide water and waste management utilities have less debt capacity. More profitable and older MOCs have higher debt capacity. Transportation MOCs with higher growth opportunities have higher debt capacity. Transportation MOCs owned by municipalities with less operating

revenues per capita have lower debt capacity than MOCs from water, real estate, and construction industries. MOCs that provide water in municipalities with higher fiscal gaps have less debt capacity, whereas water and transport MOCs acting in more indebted municipalities have higher debt capacity. The local election cycle leads to a decrease in MOCs' debt capacity.

Table 7. Regression results for debt capacity of municipally-owned companies

	total		water		real estate & constructions		transport	
	re dc	fe dc	re dc	fe dc	re dc	fe dc	re dc	fe dc
size	-0.064 (1.62)	-0.023 (0.25)	-0.125 *** (3.14)	0.038 (0.29)	-0.091 (1.14)	-0.197 (1.05)	0.054 (0.33)	-0.003 (0.01)
ROA	8.329 *** (28.22)	8.214 *** (26.60)	8.404 *** (21.73)	8.356 *** (19.31)	8.564 *** (12.20)	8.42 *** (11.68)	8.849 *** (13.00)	8.886 *** (12.97)
growth	0.000 (0.71)	0.000 (0.72)	0.000 (0.88)	0.000 (0.67)	0.000 (0.7)	0.000 (0.81)	0.001 *** (12.83)	0.001 *** (12.57)
age	0.261 *** (4.69)	0.11 (0.89)	0.309 *** (7.30)	-0.142 (1.16)	0.383 * (1.75)	0.722 (1.4)	0.22 (0.73)	0.684 (1.29)
lnrevo_pc	-0.165 *** (4.19)	-0.104 * (1.65)	-0.101 *** (2.88)	-0.066 (1.01)	-0.373 *** (3.31)	-0.631 *** (3.13)	0.423 * (1.83)	0.652 ** (2.03)
FG	0.197 * (1.85)	-0.017 (0.12)	-0.193 ** (1.98)	-0.057 (0.39)	0.406 (1.41)	0.495 (1.23)	0.155 (0.24)	-0.894 (1.19)
debt_rev	0.123 * (1.70)	0.128 (1.49)	0.216 *** (3.52)	0.226 *** (2.90)	-0.178 (0.85)	-0.344 (1.38)	0.485 ** (2.06)	0.46 * (1.83)
udc_m_	0.063 (1.000)	0.018 (0.29)	0.056 (0.84)	-0.013 (0.22)	0.281 (0.93)	0.313 (0.98)	-0.321 (1.28)	-0.358 (1.61)
elect	-0.012 (1.3)	-0.015 * (1.65)	-0.004 (0.41)	-0.008 (0.87)	-0.032 (1.48)	-0.033 (1.43)	-0.042 (1.000)	-0.036 (0.88)
limit	-0.056 *** (3.19)	-0.05 *** (2.63)	-0.039 *** (2.59)	-0.005 (0.24)	-0.136 *** (2.73)	-0.105 * (1.88)	-0.041 (0.52)	-0.142 ** (2.03)
_cons	1.841 *** (5.11)	1.313 * (1.87)	1.945 *** (5.55)	0.93 (1.000)	3.6 *** (4.97)	6.088 *** (4.16)	-4.311 ** (2.14)	-5.948 * (1.66)
R2 within	0.22	0.22	0.3	0.31	0.15	0.15	0.28	0.29
R2 between	0.24	0.22	0.51	0.32	0.12	0.09	0.05	0.01
R2 overall	0.23	0.22	0.42	0.31	0.12	0.09	0.13	0.08
N groups	1,294	1,294	786	786	351	351	112	112
N observ	9,906	9,906	6,041	6,041	2,597	2,597	871	871

* p<0.1; ** p<0.05; *** p<0.01; z statistic in brackets

Imposing more restrictive fiscal debt constraints decreases the cash holdings of MOCs that provide water and waste management services. This finding supports the **H3** hypothesis. However, estimations with the fixed-effects (FE) estimator for the total sample and real estate and constructions sector, and both RE and FE estimators for the transportation sector, provide contradictory results. These findings indicate an increase in cash holdings since new fiscal debt limits were in force. Smaller, more profitable MOCs hold more cash. Real estate and construction MOCs with higher growth opportunities hoard more liquid resources. Older MOCs in the water industry hold more cash, whereas real estate, constructions, and transport MOCs have fewer cash resources. MOCs owned by more indebted municipalities with less operating revenues per capita, higher fiscal gap, hold less cash. The local election cycle utilizes more

money held by MOCs (in total) and these MOCs that provide real estate and construction utilities. These spendings result in fewer MOCs' cash holdings.

Table 8. Regression results for cash hoarded by municipally-owned companies

	total		water		real estate & constructions		transport	
	re cash	fe cash	re cash	fe cash	re cash	fe cash	re cash	fe cash
size	-0.081 *** (6.75)	-0.093 *** (3.28)	-0.077 *** (5.61)	-0.095 ** (2.34)	-0.076 *** (2.71)	-0.06 (1.56)	-0.041 ** (1.99)	-0.083 * (1.70)
ROA	0.464 *** (7.86)	0.403 *** (6.60)	0.434 *** (5.48)	0.33 *** (3.87)	0.495 *** (4.65)	0.47 *** (4.37)	0.626 *** (3.50)	0.604 *** (3.55)
growth	0.000 (0.58)	0.000 (0.32)	0.000 (0.19)	0.000 (0.3)	0.000 *** (3.02)	0.000 * (1.77)	0.0000 (0.55)	0.0000 (0.65)
age	0.003 (0.25)	-0.017 (0.76)	0.035 *** (3.01)	0.03 (1.26)	-0.084 * (1.95)	-0.108 (1.35)	-0.098 *** (2.74)	-0.095 (0.85)
lnrevo_pc	0.055 *** (6.04)	0.029 ** (2.49)	0.039 *** (4.43)	0.028 ** (2.03)	0.062 *** (2.91)	0.026 (0.79)	0.061 * (1.68)	-0.015 (0.28)
FG	-0.104 *** (4.47)	0.01 (0.35)	-0.073 *** (2.67)	0.000 (0.01)	-0.096 ** (2.07)	0.014 (0.25)	-0.101 (0.96)	0.129 (0.85)
debt_rev	-0.041 *** (3.87)	-0.043 *** (3.37)	-0.04 *** (3.39)	-0.037 ** (2.53)	-0.039 (1.47)	-0.05 * (1.67)	-0.073 ** (2.04)	-0.101 ** (2.42)
udc_m_	-0.006 (0.38)	0.007 (0.46)	-0.028 (1.61)	-0.012 (0.71)	-0.011 (0.34)	0.008 (0.25)	0.034 (0.53)	0.07 (0.92)
elect	-0.003 ** (2.34)	-0.004 ** (2.49)	-0.003 (1.48)	-0.003 (1.39)	-0.006 ** (2.02)	-0.006 ** (2.07)	-0.006 (1.13)	-0.006 (1.15)
limit	-0.004 (1.42)	0.005 * (1.83)	-0.007 ** (2.30)	-0.002 (0.54)	0.006 (1.12)	0.015 *** (2.87)	0.024 * (1.90)	0.044 *** (2.68)
_cons	0.29 *** (3.81)	0.567 *** (3.20)	0.341 *** (4.00)	0.543 ** (2.28)	0.298 (1.63)	0.464 (1.42)	0.092 (0.5)	0.955 ** (2.41)
R2 within	0.07	0.08	0.07	0.07	0.07	0.07	0.11	0.12
R2between	0.28	0.21	0.33	0.27	0.29	0.22	0.2	0.08
R2 overall	0.23	0.17	0.25	0.21	0.2	0.14	0.13	0.05
N groups	1,294	1,294	786	786	351	351	112	112
N observ	9,906	9,906	6,041	6,041	2,597	2,597	871	871

* p<0.1; ** p<0.05; *** p<0.01; z statistic in brackets

5. Robustness check

Tables 9-12 deliver results of the re-estimated models on a more balanced panel that requires at least five-year observations for each municipal company, i.e., a subsample consisted of 456 municipalities that own 970 MOCs. We use the more balanced subsample for the robustness check of our outcomes presented in Tables 5-8.

Table 9 provides more robust results to support the H2 hypothesis that municipalities with lower debt capacity constrained by the fiscal debt rule (*udc_m*) have higher off-budget debt issued by MOCs in total (fixed effects (FE) estimator) and transport MOCs. Findings for larger, less profitable, with higher growth opportunities MOCs, acting in municipalities with less operating revenues per capita, are still valid. Moreover, results for the *lnrevo_pc* explanatory variable are significant negative also for the transport industry. But MOC's age, municipality's fiscal gap, and debt to revenue ratio are insignificant in all models.

Table 9. Results for a leverage of municipally-owned companies - subsample

	total		water		real estate & constructions		transport	
	re lever	fe lever	re lever	fe lever	re lever	fe lever	re lever	fe lever
size	0.237*** (12.18)	0.387*** (10.62)	0.215*** (8.17)	0.376*** (6.64)	0.186*** (5.96)	0.186*** (5.96)	0.275*** (5.39)	0.413*** (4.54)
ROA	-0.299*** (4.41)	-0.282*** (3.72)	-0.263** (2.01)	-0.245 (1.60)	-0.263** (2.54)	-0.263** (2.54)	-0.318*** (3.39)	-0.324*** (3.00)
growth	0.000 (0.53)	0.000 (0.55)	-0.000*** (5.03)	-0.000*** (3.20)	0.000* (1.76)	0.000* (1.76)	-0.000 (1.31)	-0.000** (2.01)
age	0.031 (1.00)	0.010 (0.20)	0.024 (0.64)	0.055 (0.88)	0.095 (1.51)	0.095 (1.51)	0.105 (1.42)	0.064 (0.53)
lnrevo_pc	-0.052*** (3.17)	-0.049** (2.26)	-0.024 (1.15)	-0.035 (1.23)	-0.143*** (5.39)	-0.143*** (5.39)	-0.100* (1.76)	-0.023 (0.33)
FG	0.034 (0.90)	-0.059 (1.34)	0.080 (1.57)	-0.013 (0.21)	0.009 (0.18)	0.009 (0.18)	0.116 (0.88)	-0.115 (0.76)
debt_rev	0.026 (1.06)	0.024 (0.91)	0.017 (0.50)	0.018 (0.51)	0.013 (0.32)	0.013 (0.32)	0.053 (0.81)	0.102 (1.56)
udc_m_	-0.046 (1.37)	-0.077** (2.40)	-0.019 (0.42)	-0.069 (1.53)	-0.038 (0.79)	-0.038 (0.79)	-0.110 (1.32)	-0.155** (2.39)
elect	-0.001 (0.66)	-0.000 (0.01)	-0.001 (0.34)	0.002 (0.90)	0.003 (0.94)	0.003 (0.94)	-0.006 (0.84)	-0.005 (0.64)
limit	0.007 (1.57)	-0.006 (1.32)	0.023*** (4.03)	0.002 (0.39)	-0.019*** (2.68)	-0.019*** (2.68)	0.020 (1.25)	-0.002 (0.10)
_cons	-0.987*** (6.72)	-2.058*** (8.15)	-1.144*** (5.88)	-2.246*** (6.09)	0.205 (0.88)	0.205 (0.88)	-0.967** (2.24)	-2.504*** (3.13)
R2 within	0.24	0.25	0.24	0.26	0.25	0.25	0.30	0.31
R2 between	0.03	0.03	0.04	0.04	0.14	0.14	0.15	0.14
R2 overall	0.04	0.04	0.05	0.05	0.11	0.11	0.14	0.13
N groups	970	970	522	522	321	321	105	105
N observations	8,019	8,019	4,504	4,504	2,425	2,425	838	838

* p<0.1; ** p<0.05; *** p<0.01; z statistic in brackets

Results shown in [Table 10](#) support the H3 hypothesis that tightening of fiscal rules related to sub-sovereign debt reduces MOCs' unused debt capacity. The local election cycle effect is significant also for water service, real estate, and construction MOCs. However, findings for the MOC's age are not confirmed, and the unused debt capacity of MOCs that provide water has weaker determinants.

Empirical evidence provided in [Table 11](#) for the more balanced subsample supports the H3 hypothesis that tightening fiscal rules related to sub-sovereign indebtedness decreases MOC's financial flexibility (measured by the debt capacity). Although the results are weaker for the MOCs operating in the real estate and construction industry, the local election cycle effect is more robust, significantly negative for a total subsample, and these MOCs that provide water, real estate, and construction services. Outcomes support conclusions that larger MOCs have less debt capacity. More profitable and older MOCs have higher debt capacity. Results for water service MOCs owned by municipalities depending on their operating revenues per capita, fiscal gap, and indebtedness are insignificant.

Table 103. Results for unused debt capacity of municipally-owned companies - subsample

	total		water		real estate & constructions		transport	
	re udc	fe udc	re udc	fe udc	re udc	fe udc	re udc	fe udc
size	-0.230*** (4.98)	-0.551*** (4.85)	-0.280*** (9.12)	-0.522*** (5.03)	-0.217** (2.50)	-0.413* (1.76)	-0.188 (1.05)	-0.432 (1.28)
ROA	8.673*** (25.61)	8.515*** (25.15)	8.648*** (19.69)	8.662*** (16.73)	9.047*** (11.52)	8.898*** (11.19)	9.054*** (12.96)	9.093*** (13.57)
growth	0.000 (0.68)	0.000 (0.61)	0.000 (1.55)	0.000 (1.49)	0.000 (0.33)	0.000 (0.68)	0.001*** (14.09)	0.001*** (13.94)
age	0.131 (1.49)	-0.042 (0.22)	0.120** (2.06)	-0.596*** (2.78)	0.237 (1.02)	0.660 (1.18)	0.146 (0.45)	0.761 (1.33)
lnrevo_pc	-0.107** (2.14)	-0.004 (0.05)	-0.021 (0.45)	0.089 (0.98)	-0.227* (1.88)	-0.561*** (2.61)	0.519** (2.10)	0.597* (1.78)
FG	0.179 (1.33)	0.134 (0.79)	-0.230** (2.17)	0.092 (0.54)	0.146 (0.49)	0.490 (1.18)	0.038 (0.06)	-0.623 (0.83)
debt_rev	0.009 (0.09)	0.030 (0.30)	0.076 (0.98)	0.069 (0.73)	-0.200 (0.84)	-0.355 (1.29)	0.470** (1.98)	0.366 (1.48)
udc_m_	0.073 (0.58)	0.103 (0.79)	0.039 (0.32)	0.100 (0.81)	0.290 (0.92)	0.388 (1.17)	-0.124 (0.50)	-0.111 (0.52)
elect	-0.016 (1.63)	-0.023** (2.31)	-0.005 (0.57)	-0.024** (2.36)	-0.043* (1.92)	-0.043* (1.79)	-0.025 (0.58)	-0.020 (0.47)
limit	-0.067*** (3.33)	-0.034 (1.54)	-0.070*** (4.21)	0.017 (0.72)	-0.098* (1.87)	-0.050 (0.87)	-0.069 (0.88)	-0.140** (2.13)
_cons	2.401*** (5.62)	4.146*** (4.84)	2.446*** (6.09)	4.100*** (4.60)	3.075*** (4.00)	6.637*** (3.82)	-3.610* (1.69)	-2.931 (0.81)
R2 within	0.22	0.23	0.30	0.32	0.16	0.16	0.28	0.28
R2 between	0.14	0.09	0.43	0.24	0.09	0.06	0.01	0.00
R2 overall	0.18	0.12	0.38	0.24	0.12	0.09	0.10	0.05
N groups	970	970	522	522	321	321	105	105
N observations	8,019	8,019	4,504	4,504	2,425	2,425	838	838

* p<0.1; ** p<0.05; *** p<0.01; z statistic in brackets

Table 4. Results for debt capacity of municipally-owned companies - subsample

	total		water		real estate & constructions		transport	
	re dc	fe dc	re dc	fe dc	re dc	fe dc	re dc	fe dc
size	-0.075* (1.71)	-0.168 (1.54)	-0.168*** (5.51)	-0.154* (1.73)	-0.065 (0.80)	-0.189 (1.00)	0.053 (0.31)	-0.018 (0.05)
ROA	8.389*** (25.18)	8.235*** (24.40)	8.510*** (19.27)	8.420*** (16.54)	8.759*** (11.57)	8.649*** (11.23)	8.736*** (13.21)	8.769*** (14.00)
growth	0.000 (0.69)	0.000 (0.62)	-0.000 (1.27)	0.000 (0.79)	0.000 (0.70)	0.000 (0.81)	0.001*** (13.52)	0.001*** (13.27)
age	0.178** (2.12)	-0.042 (0.23)	0.140** (2.32)	-0.559*** (2.70)	0.341 (1.44)	0.717 (1.23)	0.236 (0.77)	0.825 (1.53)
lnrevo_pc	-0.150*** (3.24)	-0.049 (0.65)	-0.035 (0.82)	0.060 (0.73)	-0.389*** (3.33)	-0.661*** (2.99)	0.404* (1.72)	0.574* (1.78)
FG	0.249* (1.92)	0.071 (0.43)	-0.102 (1.05)	0.071 (0.46)	0.253 (0.86)	0.383 (0.91)	0.230 (0.36)	-0.738 (0.98)
debt_rev	0.040 (0.47)	0.054 (0.55)	0.103 (1.51)	0.086 (1.02)	-0.199 (0.89)	-0.329 (1.25)	0.514** (2.13)	0.467* (1.84)
udc_m_	0.052 (0.40)	0.026 (0.20)	0.057 (0.46)	0.034 (0.28)	0.284 (0.91)	0.328 (1.00)	-0.221 (0.92)	-0.266 (1.27)
elect	-0.017* (1.80)	-0.023** (2.37)	-0.008 (0.87)	-0.022** (2.25)	-0.039* (1.75)	-0.039 (1.65)	-0.031 (0.75)	-0.024 (0.59)
limit	-0.056*** (2.92)	-0.040* (1.86)	-0.037** (2.36)	0.020 (0.92)	-0.111** (2.22)	-0.076 (1.33)	-0.042 (0.54)	-0.142** (2.10)
_cons	1.899*** (4.70)	2.099*** (2.61)	1.957*** (5.12)	1.883** (2.49)	3.633*** (4.83)	6.297*** (4.15)	-4.209** (2.06)	-5.435 (1.50)

R2 within	0.20	0.20	0.27	0.28	0.15	0.16	0.27	0.27
R2 between	0.16	0.12	0.43	0.16	0.10	0.08	0.03	0.01
R2 overall	0.18	0.15	0.37	0.21	0.11	0.08	0.11	0.07
N groups	970	970	522	522	321	321	105	105
N observations	8,019	8,019	4,504	4,504	2,425	2,425	838	838

* p<0.1; ** p<0.05; *** p<0.01; z statistic in brackets

Table 12 presents results for the more balanced subsample that support the **H3** hypothesis that imposing more restrictive fiscal debt constraints decreases MOC's cash holdings, but only in the case of water provision. On the contrary, results for the entire subsample and, separate, real estate and constructions, and transportation industry, indicate that tightening of fiscal rules related to sub-sovereign indebtedness increase cash held by MOCs. We receive these results via estimations with the FE estimator. The robustness checks support outcomes provided by estimates on the total, but an unbalanced, sample. Moreover, findings for water service MOC's age and fiscal gap of municipalities that own real estate and construction MOCs are weaker, while outcomes for the latter municipalities' indebtedness are stronger.

Table 12. Results for cash held by municipally-owned companies – subsample

	total		water		real estate & constructions		transport	
	re cash	fe cash	re cash	fe cash	re cash	fe cash	re cash	fe cash
size	-0.096*** (12.08)	-0.147*** (8.69)	-0.087*** (9.41)	-0.146*** (7.09)	-0.076*** (2.61)	-0.059 (1.51)	-0.047** (2.17)	-0.109** (2.29)
ROA	0.491*** (7.72)	0.438*** (6.86)	0.496*** (5.00)	0.391*** (4.03)	0.536*** (4.91)	0.508*** (4.56)	0.509*** (3.71)	0.495*** (3.64)
growth	-0.000 (0.63)	-0.000 (0.34)	0.000 (0.19)	0.000 (0.24)	-0.000*** (3.03)	-0.000* (1.76)	0.000 (0.59)	0.000 (0.72)
age	-0.019 (1.27)	-0.030 (1.09)	0.022 (1.51)	0.028 (1.03)	-0.095** (2.07)	-0.124 (1.38)	-0.092** (2.52)	-0.076 (0.69)
lnrevo_pc	0.056*** (5.83)	0.032** (2.55)	0.039*** (3.72)	0.030** (2.41)	0.057*** (2.58)	0.023 (0.64)	0.081** (2.21)	-0.013 (0.23)
FG	-0.103*** (4.34)	0.011 (0.38)	-0.089*** (3.25)	-0.017 (0.50)	-0.074 (1.55)	0.033 (0.57)	-0.110 (1.05)	0.188 (1.24)
debt_rev	-0.037*** (3.06)	-0.041*** (3.03)	-0.032** (2.08)	-0.030* (1.76)	-0.047* (1.70)	-0.054* (1.80)	-0.066* (1.94)	-0.102** (2.54)
udc_m_	0.010 (0.47)	0.035 (1.63)	-0.001 (0.04)	0.023 (0.92)	-0.008 (0.26)	0.011 (0.32)	0.042 (0.63)	0.084 (1.02)
elect	-0.003** (1.99)	-0.004** (2.47)	-0.001 (0.39)	-0.001 (0.77)	-0.007** (2.14)	-0.007** (2.23)	-0.004 (0.76)	-0.004 (0.76)
limit	-0.002 (0.69)	0.010*** (2.90)	-0.007** (2.08)	0.001 (0.29)	0.007 (1.24)	0.017*** (2.97)	0.015 (1.26)	0.038** (2.32)
_cons	0.429*** (6.03)	0.965*** (7.54)	0.435*** (5.16)	0.911*** (6.26)	0.350* (1.83)	0.494 (1.44)	-0.028 (0.16)	1.082*** (2.72)
R2 within	0.10	0.11	0.11	0.12	0.07	0.08	0.09	0.12
R2 between	0.23	0.17	0.24	0.18	0.31	0.23	0.13	0.01
R2 overall	0.20	0.15	0.21	0.16	0.21	0.15	0.10	0.01
N groups	970	970	522	522	321	321	105	105
N observations	8,019	8,019	4,504	4,504	2,425	2,425	838	838

* p<0.1; ** p<0.05; *** p<0.01; z statistic in brackets

6. Conclusions, Limitations, and Discussion

We contribute to the literature by exploiting the natural experiment of introducing new fiscal rules on municipal debt in 2014 in Poland. We compare the off-budget share of municipal debt and financial flexibility of MOCs in years before (2010-2013), and after (2014-2018) new fiscal rules have been in force. We provide empirical evidence to assess the effects of these fiscal debt constraints. Our results confirm that municipal services' corporatization is oriented toward overcoming the indebtedness restrictions imposed on municipalities via off-budget debt raised by MOCs. MOCs' debt has subsidized local public debt constraint by the new restrictive rules. Consequently, tightening fiscal rules related to sub-sovereign indebtedness decrease MOCs' financial flexibility measured by unused debt capacity while increasing MOCs' cash holdings. Local governments with lower debt capacity limited by the new fiscal debt rules have higher off-budget debt issued by transport MOCs.

Our results are in line with the conclusions raised by von Hagen (1991), Grossi and Mussari (2008), Grossi and Thomasson (2011) the creation of corporations is aimed at transferring part of their debt to these independent companies in order to comply with the restrictions imposed on their public finances. However, our research is the first analysis of fiscal debt rules' effects on municipal companies' financial flexibility measured by unused debt capacity and cash holdings. This finding constitutes a contribution of our study that adds value to the existing literature. We provide evidence that budgetary indebtedness restrictions influence the choice of how to acquire funds, rather than the decision to issue public debt or not. Municipalities circumvent fiscal debt restrictions by taking certain activities outside the budget. However, the off-budget financing reduces the financial flexibility of MOCs that can bring future bail-out problems.

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