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# Analysis of the Financial Behaviour of Czech Municipalities as a Possibility for International Comparisons

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**Abstract**

From the general perspective, municipalities are economic organisations like private companies with their legal subjectivity, own revenues, and property. To better understand their financial management, it is desirable to conduct relevant empirical research, which lacks in the case of the Czech municipal sector and Czech municipalities. This paper aims to analyse and identify the financial behaviour of Czech municipalities within the post-crisis period focusing on the influence of internal and external vulnerability factors. The panel data and linear regression model (fixed-effect model) were used to evaluate how an external crisis affected the financial management of municipalities. The behaviour of municipal financial management is reflected through financial health, financial dependency, or budget rigidity. The outcomes of the analysis are presented and put into perspective with relevant international research.

**Keywords:** municipality, financial management, financial health, financial dependency, budget rigidity

**JEL Codes**: H79, H20, H71

## Introduction

After the functioning of public administration was fundamentally influenced by the New Public Management, a more financially oriented New Public Financial Management (NPFM) gradually emerged based on that. According to Guthrie et al. (2005), the NPFM highlights the importance of the financial dimension in public sector management reforms and the implications for financial management in public service delivery. NPFM can also be characterised as a sub-

direction seeking new approaches to existing financial management in public administration (Lapsley, 1988; Broadbent and Guthrie, 1992; Olson et al., 1998; Guthrie et al., 2005; Padovani et al., 2010). In general, it is possible to view distinct tendencies of the NPFM and the period after it as an effort to better analyse, understand and thus subsequently manage the economy of public administration entities in terms of management of revenues and expenditures, but also assets, for example through the development of new approaches such as the financial health of the entities or more effective work with available financial data and generally in the reporting framework.

There are many reasons to study and analyse the financial management of public administration organisations in more depth, and this particular research focuses on a deeper understanding of the financial management of a selected segment of public administration (municipalities). Honadle et al. (2004) see the purpose of this direction as seeking transparent and understandable indicators for evaluating or assessing government officials in elections. According to Nemec et al. (2008) or Pavlík and Vaceková (2013), partial approaches provide suitable prerequisites for the implementation of benchmarking, performance management or financial controlling. Hendrick (2004), Wang et al. (2007) and Sohl et al. (2009) argue by creating a potential space for the development of predictability in municipal financial management. One of the key arguments for extensive empirical research in financial management issues is the lack of relevant theoretical frameworks or the lack of generally valid theories and pragmatic empiricism as the dominant approach for developing relevant concepts (Horrigan, 1968; Groves et al., 1981; Hendrick 2004, Wang et al., 2007; Sohl et al., 2009). According to Petro (1998), this specific issue is compounded by the fact that there are few norms or standards within which municipal finance can be measured with confidence and there is a lack of sufficiently malleable and transparent tools and formats that can be used to assess financial condition.

The financial management of municipalities is a part of the overall municipal management and thus of the overall public finances of a particular country. As a result, the management of individual municipalities impacts the state of public finances in general. The processes of (fiscal) decentralisation in the past decades, especially in some countries, have shifted a significant part of decision-making, assets and, most importantly, revenues to the local level (Ebel and Yilmaz, 2002; Aristovnik, 2012). As a result, the municipalities today manage considerable assets, revenues, and expenditures with a relatively high level of autonomy. This creates not only the prerequisites for self-administration and self-governance but also essential requirements for quality management, which includes the financial management of municipalities as independent economic entities within the public administration.

Moreover, specific situations (natural disasters, financial crisis, COVID, etc.) in the last two decades have shown that global turbulences do not only affect the functioning of states,

but also impact and directly or indirectly affect the functioning of all entities of the national economy, including municipalities. These unpredictable situations of global nature with impacts up to the micro-regional level have shown from the point of view of the functioning of municipalities that it is necessary to have good and strong financial management, but also appropriate, sufficient and coordinated assistance from the state to be able to survive these critical but often temporary periods of time with minimal impact on the quantity and quality of services provided by municipalities (Dzigbede et al. 2020, Padovani et al. 2021). Chen (2020) found no significant results indicating that selected LG financial condition indicators are impacted by natural disasters when the fiscal institution variables are controlled. However, crisis situations have also shown not only the preparedness or unpreparedness of municipalities for such situations from different perspectives, but also different strategies and approaches they chose during these periods (prior, during or after the crisis). Maher et al. (2020) identified within their research on fiscal responses to COVID-19 from local governments and non-profits response strategies focusing on limiting expenditures. Plaček et al. (2021) extend this strategy description to a comprehensive passive behavioural style called "municipal passivism" influenced by path dependency of a paternalistic state, which in terms of financial management perspective means not increasing public spending and rather saving and creating financial reserves. The problem is that these passive approaches expose municipalities to various risks of inefficiencies within long term period. Anessi-Pessina et al. (2020) thus argues that *governments will need to put stronger emphasis on the anticipatory and coping roles of budgeting to reduce public organizations' exposure to shocks and support governmental resilience*.

Usually, the financial management of municipalities is studied in the context of a particular municipal agenda (for example, the efficiency of public service provision) or chosen sub-category of financial management (revenues, debt, budgetary measures etc.). Kašparová (2008) analysed the revenue side of municipal budgets from the perspective of grants and transfers setting as these kinds of revenues are not part of the own municipal revenues, and therefore, acquisition of these funds is associated with certain risk on the side of municipal (financial) management. Her paper focuses on the system setting, tax revenues, and grants, and provides a perspective on grant realisation in the Czech Republic. Hájek and Hájková (2009) studied the characteristic of the debt policy of Czech municipalities from the selected region using a regression model and selected variables (size of municipal debt, population size, debt cost, revenues etc.). They found that the fiscal autonomy of municipalities, their assets and political fragmentation has shown to be key factors influencing the development of the debt in the municipalities analysed. Soukopová and Klimovský (2016) proved the dependence of inter-municipal cooperation with waste management cost efficiency as the associated expenditures with this type of municipal agenda belong among the significant on the expenditure side of municipal budgets and confirm the assumption that the municipalities can reduce

costs through this kind of cooperation. Šebestová et al. (2018) focused on municipal financial management from the perspective of developing a particular assessment tool and its desired characteristics with the help of indicators for assessing financial stability and municipality management (budgetary management ratios, indebtedness ratio and liquidity ratios) tested on selected local governments in the Czech Republic (Moravian-Silesian region). The main empirical findings of the paper say that the selected sample of municipalities shows overall good positions in the budget management ratio with very low indebtedness, which is in line with the general situation in the Czech municipal sector recently. On the other hand, it suggests also that selected municipalities should improve their liquidity ratios that are only on average level which is debatable finding according to calculated mean values of the current ratio (8.628) and the quick ratio (6.679) or also median values of the current ratio (4.985) and the quick ratio (3.498). A more in-depth analysis of liquidity management from a municipal perspective of Otrusinova and Kulleova (2019) indicated only limited scope of its use within selected Czech municipalities and prospective space for further development of this issue.

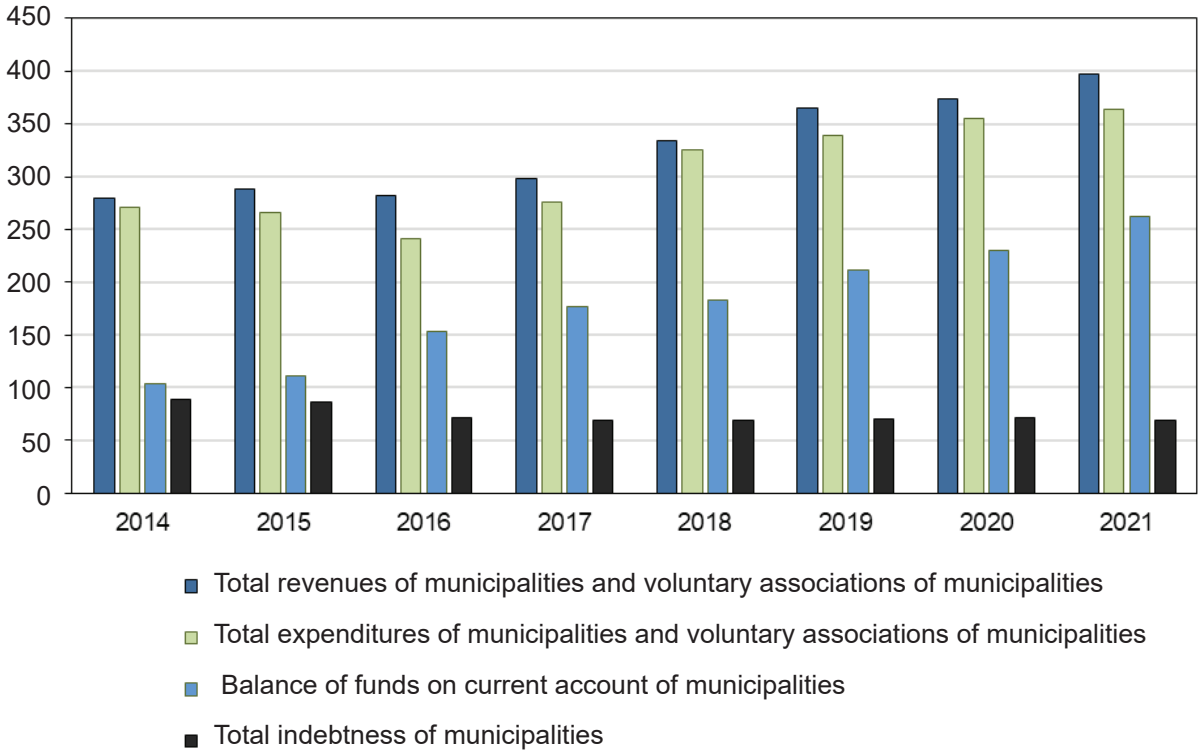
Besides liquidity, indebtedness is another important aspect of financial management analysis. Špaček and Dvořáková (2011) identified and described the development of municipal financial management under the circumstances of the economic crisis when the research outcomes showed that municipal budgets had not been affected so seriously and municipalities did not have much trouble coping with the situation. These outcomes have potentially more implications: proper mix of revenues, higher cost flexibility, budget stability, management conservatism or financial reserves. Although, as shown below, the total debt of the municipal sector in the Czech Republic has continued to decline slightly in recent years, Nemec et al. (2021) highlight that, despite similar starting positions, there are significantly more municipalities with excessive debt levels in the Czech Republic compared to, for example, Slovakia, mostly small municipalities. On the other hand, larger municipalities usually also have more options (e.g., higher bargaining power or a broader range of available assets) for debt financing (Plaček et al., 2016). Janský et al. (2016) explored the purpose of municipal debt, concluding that *municipalities typically borrow to cover investments and not to cover common expenditures*.

## 1. Czech Municipal Sector Specifics

The Czech municipal sector underwent the greatest transformation in the 1990s, especially after the revolution and in the period afterwards. As a result of the post-revolutionary development, the municipal sector was fragmented at first, but gradually settled down, and in recent decades a stable development can be seen. The total number of Czech municipalities remains stable and compared to the other EU countries is relatively high. Almost 80% of all municipalities have a population under 1000 inhabitants while more than 50% of the total number of municipalities

have a population under 500. This situation imposes considerable demands on municipal management in general, administrative capacity, and financial management. The available resources and demands are constantly increasing, which requires developing efficient financial management of municipalities. Graph 1 shows that not only revenues (resources) and expenditures (requirements) but also the total liquidity of the entire municipal sector are growing significantly over the years, while the total indebtedness is decreasing slightly over time.

**Graph 1: Development of the municipal sector in the Czech Republic via key financials (In bill. of CZK)**




Source: own processing, final accounts of the state budget for the years 2013–2021

In terms of higher liquidity, Kim et al. (1998) point out the risk of higher costs for economic agents by making decisions related to opportunity costs to invest in less liquid and more profitable assets. However, the presence and magnitude of transaction costs associated with holding and transforming assets must also be considered.

Ritonga et al. (2012) further add that greater liquidity resulting from a larger volume of current assets may lead to spare capacity potentially used to serve the citizens of the municipalities better. However, there may be a risk of inefficient use of these assets. The declining total

indebtedness is likely related to the previous phenomenon whereby, as the volume of own liquid assets increases, there is less need or demand for external resources from the perspective of economic subjects. However, the reasoning is based on the data for the entire municipal sector, i.e., they include the performance of all municipalities in the Czech Republic. Therefore, it cannot be claimed that the trends in indebtedness and liquidity apply to all municipalities. However, it strengthens the motivation to understand and analyse municipalities' financial management more closely, as mentioned in the introduction.

The municipal financial management framework in the Czech Republic was significantly influenced by the public sector accounting reform (PSAR) that took place around 2010. The reform impacted municipalities and their financial management substantially. The reform has affected financial management in many ways and aspects, for example, reporting. Concerning this research, the introduction of depreciation, accrual principles, or fair value measurement is worth mentioning.

## 2. Literature Review

Nowadays, there are many complex analytical approaches concerning the financial health of municipalities. There is some partial evidence about certain aspects of path-dependence theory also in this specific field, but on the other hand, there is also a lot of aspects which make the analysis of municipal financial health or condition endogenously variable. The inner variability arises potentially from different accounting approaches or techniques implemented within national countries systems, different revenue flows or settings, different financial management or general management approaches in municipalities at all etc. Therefore, it is challenging to make international comparisons of municipal financial management or international replications and associated comparisons of reached outcomes and results. Padovani and Scorsone (2009) tried to tackle this general problem and develop the framework for comparing local governments across countries at the local level. Further, Padovani et al. (2021) argue that after the financial crisis, the literature has often focused on partial public policy issues or crisis management, neglecting the financial vulnerability of municipalities.

Some analyses of the financial behaviour of economic subjects facing negative situations were conducted. Wilson (1984) identified several potential factors of vulnerability of an economic subject through structural errors, such as current expenditures exceeding current income consistently and significantly, the occurrence of a continuous deficit in expenditures or shortfalls, or current liabilities exceeding current assets (i.e., negative liquidity). Based on Nollenberger et al. (2003) and Hendrick (2011), following analytical approaches to the municipal solvency can be identified: a) cash solvency: the ability to generate enough cash within 30–60 days to fund the expenditures – quick ratio (cash + cash equivalents / current liabilities) or current

ratio (current assets / current liabilities); b) budget solvency – the ability to achieve balanced budget or generate enough resources to cover expenditures during the budget term – operating ratio (revenues / expenditures) or fund balance ratio (fund balance / expenditures); c) service-level solvency: the ability to achieve adequate public services provided by the municipality based on the available resources – ratios of revenue per capita or expenditures per capita; d) long-term solvency: the ability to balance revenues with expenditures, fulfil actual and future commitments and cope with unknown financial obstacles in the long run – ratios of long-term liabilities / total assets or revenues per capita and expenditure needs. Ritonga (2014) also adds the aspect of financial independence in his view of municipal solvency. But there are also other analytical approaches aiming at predicting or assessing negative financial conditions like municipal bankruptcy from various perspectives (Elliehausen and Lawrence, 2013; Skogsvik and Skogsvik, 2013). For example, Civitillo (2012) identified the following risk factors that can lead to the occurrence of municipal bankruptcy: a) poor financial management (e.g.: repeated deficits); b) disproportionately ambitious goals of municipality management; (c) only short-term management objectives and policies; (d) poor cash-flow management; (e) excessive debt exposure; (f) ineffective management control system; (g) the inability to quickly identify potential threats and/or the inability to respond rapidly to remedy them; (h) uncontrolled increase in expenditure; (i) increasing deficit (without investment); (j) continuous growth of local taxes collected; (k) discontinuity in management; l) lack of management tools to support municipality management; (m) the occurrence of negative events, including market influence. Manes Rossi et al. (2012) developed their structure of indicators able to recognise and prevent the financial distress of the municipality: a) consistency of financial results; (b) the quality of financial results; (c) the current financial balance; (d) rigidity of staff expenditure; (e) the debt limit. Deal et al. (2013) identified the following eight potential indicators of the fiscal distress of municipalities relating both to the revenue or expenditure side of the budget and to municipal assets: a) a budget with prevailing current expenditure over income; (b) long-term over-spending of expenditure over revenue over several years; (c) short-term liabilities over current assets (liquidity-related); (d) short-term operating loans outstanding before the end of the fiscal year; (e) a high rate of real estate tax coupled with a high rate of non-payment or delay in collecting the tax; (f) an unexpected sudden significant fall in the value of immovable property; (g) lack of funds in pension funds; (h) poor accounting, budgeting and reporting techniques and procedures. Brusca et al. (2015) examined the similarities and differences of selected indicators concerning the detection of the financial distress of municipalities using the example of municipalities in Spain (capital expenditure per person or percentage of personnel expenses relative to operating income proved to be significant indicators) and Italy (indicators such as fiscal revenue versus GDP or fiscal distress and operating transfers and subsidies proved to be significant indicators). Cohen et al. (2017) focused their analysis on municipalities' financial position on vulnerability.

They found that its cause may not be just one reason but several different factors, usually operating simultaneously. In line with previous research, short-term payables on current incomes, personnel expenses on current incomes and, to a lesser extent, transfers and subsidies per capita proved to be significant factors of vulnerability of municipal financial position. The importance of fiscal reserves, debt, or revenue composition in predicting local fiscal distress was demonstrated by Gorina et al. (2018). Using the example of municipalities from Italy and France, Padovani et al. (2017) identified and verified selected external and internal vulnerability factors (GDP, transfers and subsidies received, the economic performance of the municipality, population, financial dependency of the municipality, budget rigidity, short-term and long-term fiscal distress), all of which proved more or less relevant. However, in comparing the indicators and the related actions and policies implemented, there was a consensus in some cases across the two countries. In others, there was a different development. Du Boys (2017) investigated the effects of the crisis on the vulnerability factors of selected municipalities and the influence of their financial and organisational capacities on their resilience patterns. Barbera et al. (2017) distinguished between internal (within the organization) and external (out of the organization) sources of vulnerability which is in line with other previous approaches to this particular issue and this philosophy is used later within the analysis. Cohen and Hlepas (2017) showed, in the case of Greek municipalities, that they are still rather vulnerable to future shocks.

## 3. Methodology

The approach was chosen concerning the main goal, namely the identification of bankruptcy aspects of municipalities, or more precisely, the vulnerability factors of their financial position or budget (cash access application), which Padovani et al. (2017) analysed using internal and external factors (for the period following the financial crisis) on the examples of the municipal sectors in Italy and France, and later in other comparative studies. This model and approach have been replicated in this study in the case of the Czech Republic. Three main objectives have been set in mentioned studies:

- How do the chosen factors influence decision-making regarding expenditures and revenue, and to what extent are these factors comparable between the municipal sectors in different countries?
- What were the responses to the crisis regarding revenue and expenditures decision-making within the financial resistance of the municipalities in the countries under review?
- Identify and describe these patterns over the reference period of 2008–2015.

When defining the term "financial resistance of the municipalities", Steccolini et al. (2017a) findings are also inspirational. The authors describe it as the capacity of the municipalities to predict, absorb, and respond to shocks affecting their finances over time. Padovani et al. (2017) define three types of activities for coping with such situations or processes – buffering, adaptive, and transformational – as well as the term vulnerability, which according to them, is based on internal and external factors with the perceived vulnerability described as the result of primarily internal factors. In addition, according to the authors, the comparative (cross-country) study made it possible to isolate the effects originating from the national context (Italy, France, the USA, the Czech Republic) to a certain extent, with models of countries with high fragmentation of the municipal sector and similar types of services provided at this level (i.e., waste and water management, road maintenance, social services, education, building permits, territorial planning, etc.). According to Sohl et al. (2009), when choosing comparable municipalities, for example, in terms of performance benchmarking, there are many opinions in the literature that suggest using only one or two simple determinants – the population or the size of the organisation.

Meanwhile, the data set of the study by Padovani et al. (2017) is limited to municipalities with a population of over 10,000 inhabitants. This study was working with a broader scope using data from all Czech municipalities for which the data was available. Overall, the data for municipalities (N=6255) were collected for the years 2010–2016 from the database MONITOR for the post-crisis period as the intention was to analyse the influence of internal and external factors of vulnerability based on Padovani et al. (2017) model replication and comparison of relevant outcomes and associated discussion.

The subject of the panel data analysis were the four following variables: change in a municipality's own revenues between years (MOVVAR), change in personnel expenditures between years (PEVAR), change between other common expenditures (CUREXPVAR) and change in capital expenditures between years (CAPEXPVAR). The overview of all the variables, including those representing the external and internal factors influencing the perception of vulnerability from the point of view of the municipalities, is presented in the Table 1.

**Table 1: List of variables used and their description**

| **Independent variables** | |
|---|---|
| **External factors** | Description |
| GDPGROWTH | GDP change between years N–1 and N–2 |
| POLICYGRANT | Change of grants received by a municipality between years N and N–1 |
| POPGROWTH | Change in municipality population between N and N–2 |
| **Internal factors** | |
| FINDEP | Financial dependency |
| | Volume of transfers and subsidies on total revenues in year N–1 |
| BUDRIG | Budget rigidity |
| | Personnel expenditures on total revenue in year N–1 |
| FHSHORT | Fiscal distress, (short-term financial health) |
| | (total revenue-total expenditures) /total revenue in year N–1 |
| FHLONG | Fiscal distress, (long-term financial health) |
| | Long-term liabilities / total revenue in year N–1 |
| **Dependent variables** | |
| MOVVAR | Change in a municipality's own revenues between years N and N–1 |
| PEVAR | Change in personnel expenditures between years N and N–1 |
| CUREXPVAR | Change between other common expenditures (excluding personnel exp.) between years N and N–1 |
| CAPEXPVAR | Change in capital expenditures between years N and N–1 |

Source: adjusted, Padovani et al. (2017)

Some external factors may play a crucial role in identifying vulnerability factors in the financial management of municipalities (GDPGROWTH, POLICYGRANT, POPGROWTH) concerning the importance of the municipality financing process. GDP has a crucial impact on municipal revenues, especially on tax revenues as their main component. Transfers and subsidies after-tax usually constitute other significant revenues, although unsecured and irregular. They are highly volatile and often dependent on the state and different public budgets. Another key external variable is the number of inhabitants, which is also a factor

that significantly influences the financial management of the municipalities, i.e., revenues and expenditures, as well as capital. Internal factors for the Padovani et al. (2017) model were chosen based on their own research of literature and the accumulated relevant findings and were also supplemented by findings from the studies by Steccolini et al. (2017a) or Jacob and Hendrick (2013):

- Level of financial dependence on sources of other public budgets
- Level of budget rigidity
- Level of short-term fiscal distress
- Level of long-term fiscal distress

The models of the explained variables (MOVVAR, PEVAR, CUREXPVAR, CAPEXPVAR) each represent specifically defined municipal financial policies which, according to the authors, are accepted in response to the perceived vulnerability and to deal with the effects of a crisis or limitations in the form of the implementation of different strategies.[1] For example, the municipality revenues (or, more precisely, their change represented by the variable MOVVAR) are a key element in the management of each municipality and also form the largest part of overall municipal resources. Therefore, their positive development is crucial to the management and development of the municipality. From the point of view of dependence on other public budgets, procedures, and processes (in particular, subsidy management), own municipal revenue is an expression of financial independence and also of lower transaction costs associated with obtaining subsidies or less uncertainty in the preparation and implementation of the budget and municipal development. As shown in previous surveys conducted for this study, there are a number of municipalities which, in the context of their capital development, do not rely on subsidy mechanisms. They have this option courtesy of their revenue and its role in their budget. Also, capital expenditures (CAPEXPVAR) and personnel expenditures (PEVAR) are variables that help express some form or measure of a particular financial policy or strategy adopted by a given municipality. Capital expenditures affect the municipality's development, although according to some authors, they are also likely to be subjected to restrictions or limitations. Therefore, according to some, it may not be suitable for long-term development (Dunsire and Hood, 1989; Scorsone and Plerhoples, 2010). A similar analogy can be seen in the case of personnel expenditures. According to Padovani et al. (2017), it is a matter of great interest in the current research in this field to observe how it affects the revenue or expenditures side of multiple pricing decisions and, at the same time, regarding the application of the financial resilience framework.

1 Restrictions or cutbacks (Baker, 2011), expansion (Steccolini et al., 2017b) and other types and forms.

# 4. Results and Discussion

For the analysis of the panel data, a linear regression model (fixed-effect model) was used, where $i$ represents the index variable for the unit – municipality ($i = 1, \ldots, N$), and $t$ is the variable for the time period – year ($t = 1, \ldots, T$). The model was inspired by the one used by Padovani et al. (2017) chosen over random effects on the basis of the Hausman test (Hausman 1978) and specified as follows:

$$y_{it} = \alpha_i + x'_{it}\beta + \varepsilon_{it} \tag{1}$$

## 4.1 Case study of the Czech municipal sector

**Table 2: Outputs of individual models**

| CZMODEL (N=6255) | MOVVAR | PEVAR | CUREXPVAR | CAPEXPVAR |
|---|---|---|---|---|
| **GPDGROWTH** | 3.731e+00** (1.298e+00) | 7.167e-01*** (8.683e−02) | 5.654e+00*** (8.303e−01) | −1.771e+01*** (4.896e+00) |
| **POLICYGRANT** | 2.019e−01 (2.422e−01) | 3.594e−02*** (7.105e−03) | 8.090e−01*** (7.994e−02) | 2.170e−01 (6.392e−01) |
| **POPGROWTH** | −2.234e+04 (3.871e+04) | 5.725e+03*** (1.279e+03) | 3.789e+04 (2.206e+04) | 4.854e+04 (7.170e+04) |
| **FINDEP** | 9.602e+06 (7.748e+06) | 1.704e+05 (2.281e+05) | 2.053e+07*** (2.581e+06) | −1.819e+07 (2.035e+07) |
| **BUDGRIG** | 1.962e+07*** (1.388e+06) | −2.288e+06*** (9.955e+04) | −6.691e+05 (1.163e+06) | 1.670e+07*** (2.864e+06) |
| **FHSHORT** | −1.367e+05 (2.690e+05) | 3.093e+04** (1.171e+04) | 1.684e+06*** (2.390e+05) | 9.016e+06*** (6.948e+05) |
| **FHLONG** | 4.134e+05* (2.089e+05) | 4.201e+04*** (1.257e+04) | 1.004e+06*** (2.395e+05) | −1.294e+06* (5.525e+05) |
| **Multiple R-sq. (full model):** | 0.2887 | 0.6385 | 0.7775 | 0.1653 |
| **Adjusted R-sq.:** | 0.1463 | 0.5661 | 0.7329 | −0.001823 |

Notes : signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Source: own processing

## 4.2 The influence of external factors on the financial policy implemented by municipalities

A significant external factor in all models was the change in GDP (applied with respect to its character with a certain time lapse), which positively affected the first three dependent variables (MOVVAR, PEVVAR, and CUREXPVAR). On the other hand, it affected the change of capital expenditures negatively (CAPEXPVAR), which is partially confirmed by the development of the relevant aggregated data (GDP, income and tax revenues, capital expenditures). GDP and tax revenues steadily increased over the period under review. However, the amount of transfers and subsidies stagnated. That imitates the trend of capital expenditures (as well as current expenditures), i.e., despite the persistent and long-term economic growth reflected in rising tax revenues and overall economic activity since the financial crisis, the capital expenditures for the whole municipal sector are largely stagnating and de facto the total expenditures of the municipalities as well. Therefore, the continuous growth in total revenue of municipalities is reflected in the growing liquidity of the municipal sector and not in their increased activity through regular (services) or capital (investment) expenditures.

According to Smoke (2019) *considerable attention has been given to enhancing subnational development finance in response to the 2008 global financial crisis*. The financial crisis showed in many countries the (in)resilience of public budgets (in this case, municipal budgets), which manifested itself differently. Intergovernmental relations and funding played a significant role in this. Therefore, part of the analysis was also devoted to examining the impact of transfers and grants on other financial characteristics of municipalities. The change in the volume of transfers and subsidies (POLICYGRANT) had only a significant and positive effect on changes in personnel costs and changes in other current non-personnel costs (this may be related to the increase in the work agenda or activity as a result of requesting or drawing subsidies or to an increase in other operating expenses related to the implementation of subsidies). However, it had no significant impact on the change in municipal own revenues or the change in capital expenditures. This may seem somewhat surprising, although it may be related to the assertions mentioned above and findings that some municipalities finance their capital activities from their own resources and not from the subsidies received. Some municipalities also receive finance from external sources. The latter also confirms Janský et al. (2016) by testing the crowding-out hypothesis. They complete the picture of municipal behaviour by showing that municipalities often borrow to cover investments as opposed to common expenditures. Of further interest is that during the analysed period of 2010–2016, the volume of subsidies and transfers dropped by more than 40 billion CZK, representing approximately 15% of the total turnover of the municipal sector. However, from a retrospective view, the municipalities were able to cope with this downturn and adapt to the new situation. They did not have to sell their own liquid assets, which

on the contrary, grew at that time. It is also appropriate to add that total debt also increased slightly. Some research shows that subsidies and transfers are one of the factors of municipal vulnerability both from the point of view of other public budgets, which can continuously modify this expenditures group, and change from the point of view of individual municipal budgets. Through the increase of this income, groups can increase their dependence on other than their own resources, while those who receive more subsidies and transfers in this way can create conditions for the growth of the budget or the economy of the municipality. This may subsequently result in growth over a longer period. Soltyk (2020) highlighted the *relationship according to which the variability of revenues significantly impacts the amount of budget subsidies*. As mentioned in the literature review, according to Cohen et al. (2017), transfers and subsidies per capita are also a factor behind the vulnerable financial position of municipalities according to their study. Smoke (2019) recommends improving subnational development finance by restructuring intergovernmental fiscal frameworks or improving predictability and buoyancy of intergovernmental transfers. However, in the negative scenario, they can result in growing pressure on the long-term dimension of the expenditures side of their budget and, therefore, its declining sustainability rate. Hypothetically, a question arises for further research, i.e., whether the greater financial dependency of the municipalities (FINDEP), or more precisely, the development of the subsidies and grants received (POLICYGRANT) will lead in the long term to strengthening, stagnation, or even weakening of the sustainability/flexibility of the municipality's financial position and its budget. For example, Stone (2015), building on a strong theoretical debate on the advantages and disadvantages of decentralisation, showed in the sample of municipalities that intrastate fiscal decentralisation results in weaker financial conditions for municipalities. Regardless, it appears that the aspect of the financial management of the Czech municipalities has not recently played an important role as a vulnerability factor with an immediate impact on municipal management. Although, the long-term impact and implications should be monitored considering the sustainability of the municipal budgets and the flexibility of their financial positions. In terms of the implications of both variables on the financial behaviour of municipalities in the sense of smaller subsidies and grants within their budgets and their adopted financial policies, Padovani et al. (2017) identify a pattern of behaviour where these municipalities develop adaptive coping capacities by limiting rigid parts of their current budget to protect themselves against fluctuations in subsidy and grant volumes from other public budgets. The importance of anticipatory and coping capacities of municipalities towards the resistance to shocks affecting their financial condition points out by Barbera et al. (2020). Galariotis et al. (2016) proved the differences in terms of the size of municipalities towards better financial condition (medium-sized municipalities) or resiliency to adverse external conditions (larger municipalities). Studying and analysing their financial behaviour from the perspective of their size could lead to better and custom-fit recommendations

for their financial management. Population change (POPGROWTH) did not appear to be a significant variable in both the Czech and foreign models, with minor exceptions, which is justified by Padovani et al. (2017). The authors explain that the indicator tends to influence the financial health of the municipality in the long term rather than in the short term as partial short-term financial policies are implemented in these models. The exception in the Czech model is the significant positive influence on the change of personnel expenditures, which can be related to the short-term (flexible) increase of personnel expenditures on services provided to citizens due to the population increase. On the other hand, some studies point out the influence of external factors, including population size, on capital expenditure deviation: for instance, Haraldsson (2022) analysed the Swedish water and sewerage sector.

## 4.3 The influence of internal factors on the financial policy implemented by the municipalities

Financial dependency (FINDEP), represented by the ratio of subsidies and transfers to the total revenues of municipalities that characterise the degree of financial dependency of the municipalities on other public budgets, has proven to be a significant explanatory variable only in the case of other current expenditures, on which it has a positive impact according to the relevant model. Municipalities with a higher ratio of subsidies and transfers tend to increase other current non-personnel costs, which may be related either to the nature of the resources used or to the actual process of drawing or implementing the subsidy in the municipality's management. In turn, it may be related to new or increased expenditures due to the subsidies and transfers received. Some validated hypotheses of Padovani et al. (2017), for example, that the higher dependency of the budgets on other public sources causes pressure on higher own revenues or increases capital expenditures, which can indicate a tendency to increase of own municipal autonomy and increase of their spending capacity, have remained unconfirmed. Bisogno et al. (2019) showed in their study that less *dependency of LGs on external resources, when current expenditures may be covered by current revenues, by reducing the level of indebtedness, and by controlling the investment in long-term projects.* To prevent solvency problems, it is crucial from their point of view to control the relationship between current revenue and expenses. Jimenez and Afonso (2021) enriched the current knowledge in this area on the example of US cities with the evidence that type of revenue diversification matters towards budgetary solvency, especially diversifying to non-tax sources improves this type of solvency, while diversifying within the tax revenue structure has different impact on budgetary solvency.

The budget rigidity (BUDRIG) proved to be a significant explanatory variable in the model with a positive effect on the change in own revenues and the change of capital expenditures. On the other hand, there is a negative correlation to the change in personnel costs, all of which

are in line with the outputs of the models used by Padovani, according to whom in the event of high rigidity of the budget, the municipalities tend to limit or reduce personnel expenditures while increasing other current expenditures through which they can outsource sub-activities and processes. However, this was not confirmed in the model replicated on Czech municipalities because, in the case of CUREXPVAR models, the BUDRIG variable was not significant, unlike in the models for Italy and France, where the positive relationship was detected. As in the foreign models, the relationship between budget rigidity and own revenues turned out to be positive but negative towards personnel expenditures, which Padovani et al. (2017) interpret as *"a tendency in municipalities with greater budget rigidity to increase their own revenues and reduce personnel expenditures through the implementation of adaptive and transformative coping capacities to reduce the level of budget rigidity through higher fiscal autonomy and reduce rigid parts of the current budget".* Bisogno et al. (2019) based on their study add that "*preserving financial autonomy from external sources and controlling the level of indebtedness are key elements for guaranteeing sound financial management".*

The short-term fiscal health of the municipality (FHSHORT) has a significant and positive effect on personnel expenditures, other current expenditures, and capital expenditures. On the contrary, the impact of this variable on own revenues, unlike in the foreign models, has not been proven, which is probably because most of the Czech municipalities' own revenues are generated from tax revenues that are de facto independent of the short-term financial health of municipalities and are related to GDP, the size of the population or the variables defined by tax revenue sharing system. According to Padovani et al. (2017), the significant and positive impact of FHSHORT on the cited variables is predictable, especially in the case of current expenditures (PEVAR, CUREXPVAR) if the municipalities record positive short-term financial health outcomes, i.e., they reflect their positive short-term financial position in the increase of the current expenditures and also in the increase of capital expenditures in the Czech model. In contrast, the change has not been demonstrated in the foreign models.

Long-term fiscal health (FHLONG) positively impacts the change in own revenues, personnel, and other current expenditures. On the contrary, a negative effect on capital expenditures was identified. Certain decrease in capital expenditure within austerity times were identified by Barbera et al. (2020). Padovani et al. (2017) attribute the combination of the positive effect on own revenues and the negative effect on capital expenditures to the pressure in the event of an increase in the long-term debt burden on municipalities and lead them to increase their own revenues and reduce capital expenditures, thus implementing a cautious or prudent financial management strategy in such a scenario, as confirmed by the model applied to the selected French municipalities. Similarly, the positive relationship between the FHLONG and PEVAR variables was surprisingly confirmed in both the French and the Czech model, suggesting that personnel expenses are rising with a higher debt burden. However, in the case of the Czech

model, it is important to consider the overall debt situation of the municipalities and the public sector, which is very low in both the total and the average values; therefore, this analogy does not necessarily appear as risk behaviour as it would in the case of a higher debt of the municipalities. The positive implications between FHLONG and CUREXPVAR may yet again be related to the new costs incurred in connection with the preparation, implementation and administration of a new investment or municipal project since previous knowledge in the workplace and current practical long-term foreign resources are mainly used for the implementation of capital projects and investments that imply both capital, but probably also some current expenditures, as well as long-term current (operating expenses) and capital expenditures (reconstruction or other investment).

## Conclusion

Using a replication of a foreign model, this study has shown, with some limitations and applied on selected variables, that there are strategies, practices and procedures of local governments in relation to the period of ongoing or aftermath of crisis. Barbera et al. (2021) identified and distinguished between bouncing back (e.g., cutback, retrenchment, downsizing) and bouncing forward (e.g. transformation, repositioning) strategies while emphasizing the importance of developing anticipatory capacities and building financial resilience culture to be able as LG to cope with difficult times. We are not yet far enough in terms of knowledge and experience to identify and describe the comprehensive strategies and practices that local governments in the Czech Republic have implemented as a result of the crisis period, but the framework used from the international environment has shown, taking into account the specifics and limitations, the possibility of replication in the local environment. Thanks to this partial knowledge, it is possible to gradually seek a starting point for a comprehensive understanding of financial management and, thanks to this, to strengthen the knowledge capacity of management in relation to certain specific situations. Iacuzzi (2021) in her structured literature review describes the growth of literature on financial indicators but without clear picture for which common purpose or circumstances and mainly developed in the 1980s. Therefore, it is of utmost importance to look for new ways or to verify existing ones, for instance by replication as in this study.

Through their study, Padovani et al. (2021) opened a new chapter of analysis of the external crisis on the financial management of municipalities, this time replacing the financial crisis with the Covid-19 pandemic and its impacts. This is also one of the relevant potential leitmotifs for further research. A question arising from this study for future research agenda is whether the greater financial dependency of the municipalities reflected by the development of the subsidies and grants received will lead in the long term to strengthening, stagnation

or even weakening of the sustainability or flexibility of the municipality's financial position and its budget. Finally, one of the future research topics may be to examine the impact of municipalities' size or other characteristics on their financial health or, for example, their resilience to external financial shocks.

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