

Municipal Revenue Determinants in the South-Eastern European Economy: Evidence from North Macedonia

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Abstract

Sustainability of municipal finance implies steady revenue generation. Pinpointing their determinants creates the necessary background in their management and policy creation. Great municipal dependence on central government finance remains a serious challenge in the process of fiscal decentralisation. So far, studies have been focusing on the expenditure side, while revenues were treated mostly marginally. A random-effects Generalized Least Squares (GLS) panel regression for the period of 2015–2019 is estimated for targeting revenue determinants of municipalities in North Macedonia. Own and total tax revenues are modelled separately through the impact of capital expenditures, salary expenditures, active transparency index, municipality type, and local government's ideology. The general results indicate that capital expenditure, municipal transparency, and the level of development are significant determinants of municipal revenues in both estimated models. Using such knowledge on municipal revenue reactions can help governments formulate policies that provide sustainable and effective fiscal decentralisation, lowering the pressure on central governments in developing economies.

Keywords

revenue determinants, local finances, fiscal decentralisation, North Macedonia

1. Introduction

The continuity in the process of fiscal decentralisation throughout the years has set the foundation for a vast number of economic research and debates among academics. Deriving its genesis in the public finance theory and fiscal efficiency, fiscal decentralisation and the respective judiciary process of federalism is not a new concept at all, hence it has already been discussed for at least seven decades (Buchanan 1950; Tiebout 1956; Musgrave 1959; Furniss 1974; Oates 1993, 1999). Viewing fiscal decentralisation as a remedy for chronic governmental inefficiency in providing public goods was probably a turning point in public finance studies. However, its implementation today is more of an art rather than a set of economic and political reforms. With this in mind, the topic quite commonly provides a clash of interests, beliefs, and ideas, which gave the authors enough motivation for conducting the presented research.

There is scarce literature regarding local revenue determinants, which is more than enough of a stimulus for us to explore this topic and estimate the potential factors in the revenue generation process. We firmly believe that sub-central levels of governance can recognise and fulfil the residents' needs for public goods much more effectively than the central government. Since every local jurisdiction has different public goods preferences, it is much easier for local governments to keep in touch with those. Even though the revenue system is the core of public goods availability, much of the present-day local governments do not experience adequate fiscal autonomy. Their chronic

dependence on vertical and horizontal transfers restricts them from complete sovereignty over the usage of these disposable funds in most of the developing economies, resulting in partial inefficiency. As expected, due to the different levels of development, horizontal revenue disparities are always present between local units. This leads the authors to focus on the potential determinants in their revenue generation process, which might help us explain why these differences exist and what are the possible implications. However, it must be noted that depending on the level of local development, as well as the types of function delegations, local governments can be more or less successful in collecting and even generating revenues. If high disparities are present between the number of functions delegated to municipalities and their available revenue sources, their functionality can be severely impaired.

The presented topic of research is particularly important due to the ongoing process of fiscal decentralisation in many South-Eastern European economies. The number of published works for the SEE region is rather scarce, and our aim is to fill that void, particularly by means of studying local revenues and their factors. Similar works and ideas have been found in the case of Serbia when estimating the local economic development determinants (Bartlett et al. 2020). While other SEE economies tend to be of greater interest, the case of the Republic of North Macedonia lacks previous research. Contributing to the regional and global literature, we aim to provide the necessary empirical work in postulating theoretical foundations and governance by policy-creators.

For this research, we use the random-effects panel analysis for the period of 2015–2019. Our disposable data consists of all municipalities in North Macedonia (i.e. 80 municipalities and the city of Skopje) with annual observations. Having a *de facto* simple model of fiscal federalism with just two levels of governance (central and municipal) makes this research ideal for a much more efficient and informative estimation of local revenue determinants. Data sources as well as their further adjustments before model incorporation are presented in Section 3.2. of this paper. By using panel regressions, municipal revenue indicators (i.e. own revenues and tax revenues) were regressed by key factors, such as capital expenditures, salary expenditures, and active transparency index. Municipality type (urban or rural) and local government's ideology (right- or left-oriented) were included as dummy variables to account for as potentially unobservable, but essential factors in our model, since we firmly believe that these two are an unbreakable component in the big picture. By doing this, we pay specific attention to the longer-term effects on growth through capital expenditures, the household income component through salary expenditures, and fiscal transparency, which is regarded as one of the leading factors in modern local governance. Likewise, the urbanisation and the political orientation of the governing structure are often examined in similar research, which is why we aim at evaluating their importance in North Macedonia.

The main idea behind this research is represented through several research questions, i.e. hypotheses, which we tend to explore. First, we would like to determine whether a positive relationship exists between the level of municipal capital expenditures and revenues. As local governments tend to spend more, the idea is that such activities should naturally spark greater economic and financial activity at the local level. By doing this, the revenue side should be also positively impacted through the now supposedly greater tax base. In line with this notation, we also focus on the never-ending debate over whether greater salary expenditures stimulate an increase in municipal revenues. Consequently, such effects should manifest through higher local revenues at disposal. Nevertheless, we must indicate that the disposable income is influenced by several other unobserved factors, such as the real interest rate in the economy, cultural tendencies towards expenditures, the persistence of wealth among households in a particular municipality, etc. Local governments' transparency has been the prime focus of authorities and the public in the recent years, and we believe this question should be addressed properly. As developing economies evidently lag by far behind the developed ones in terms of public institutions' transparency, noting its importance and influence is of key interest. Our firm belief is that higher transparency of local authorities tends to increase local revenues. Even though the size and development are mainly intuitively influencing the revenue side, our objective is to verify whether the urbanisation of municipalities plays a significant role in the Macedonian case. By the inclusion of a political orientation as a dummy variable, this paper gradually follows up previous studies. The usual theoretical nexus is that left-oriented governments subsidise larger revenues though higher taxes and fees, opposing the right-oriented

authorities. As the Macedonian case perfectly fits in between these two orientations in the proposed sample period (sharp shift from predominantly right- to left-oriented party rule), we can target this question adequately. By influencing own revenues and tax revenues, the proposed variables imply a significant role in maintaining stable local economic development and sustainable finances. Only through greater financial power can true decentralisation be achieved.

The usual interest in the literature presents more general economic variables, such as the size of population and area, economic growth, inflation, unemployment, as well as a particular focus on the decentralisation of expenditures. Consequently, it is understood that a greater focus is put on the relationship between decentralisation and economic growth and development. Contrary to such research, our emphasis is on the revenue side with a set of new potential determinants that we believe are of significance. Setting our model, we ought to uncover any potential relationships already observed in the literature – which can be applied in the Macedonian case – as well as find new ones.

This paper is structured as follows: Section 2 presents the literature overview on some of the key global works in the estimation of local revenue determinants. By presenting some of the most important findings, we make the foundation of our model based on possible theoretical relationships, unobserved factors, popular concepts, as well as previous research practices. Sections 3 and 4 present the research methodology and the data-obtaining process, which is then followed by a brief discussion based on the model's results and possible policy implications. The conclusion is presented at the end of the paper, while all the tables related to the models' output are presented as appendices.

2. Overview of the relevant literature

In this section, we present some of the related and intriguing literature regarding the topic of our research. However, we must note that studies on complete local-level revenue determinants are rare. Most of the authors either focus on a partial sample of municipalities or analyse local determinants across different groups of countries. Given these initial restrictions, we tend to be unbiased in our presentation, as all of the determinants imply significance in creating our research.

Fiscal decentralisation is an expensive and tiresome process. The increase in government activity and the emergence of the social state throughout the years is understood to be the reason why fiscal centralism has gradually decentralised (Buchanan 1950). Moreover, residents who can be classified as consumers or voters focus on their preferences, matching them with a now more efficient local administration (Tiebout 1956). Hence, fiscally-independent local jurisdictions probably generate larger benefits rather than costs to national economies (Bird 1993). Usually, developing countries experience a much more centralised fiscal governance than what is the case in developed countries. One of the side effects is the particularly vast dependency of local jurisdictions on central government transfers, which can seriously restrain their autonomy. In that case, most of the financing activities would become negotiations between central and local authorities, undercutting local fiscal independence (Oates 1993, p. 241). Consequently, the necessity and degree of own sources of revenues for the local government remains a focal point of interest. Bahl (1999) argues that more developed or urban areas can easily rely on local taxation than rural ones, which are deemed to function with a larger proportion of grants and funds from the central government. Since the fundamental idea is about delegating own sources of revenues and expenditure autonomy to provide the optimal level of local public goods, this topic sparks debates regularly. However, our objective is not the particular process of fiscal federalism and its fundamentals; rather, we focus only on the complicated foundations of local revenue determinants.

Most of the available research literature focuses on potential determinants on local revenue efforts by local governments (Luo and Douglas 1996), revenue decentralisation (Maličká et al. 2012), revenue fluctuations (Sedmihradská and Čabla 2013), or even revenue elasticity (Overton and Bland 2017). By aiming to determine local government revenue determinants and factors, researchers help in disentangling the rather complex relationship between economic development, demographic characteristics, political orientation, and local revenue generation. By revisiting some

of the scarce literature, we ought to find the key factors in the revenue system of local governments, which helps us build our model on solid and yet previously unestablished relationships.

Previous research suggests that one of the most common factors influencing local revenue is probably the population of the respective sub-central unit. Even though it may look like a straightforward relationship, some findings oppose this presumption. Commonly used as a control variable, population size insignificance is estimated in the works of Blom-Hansen, Monkerud and Sorensen (2006), Hadiyan, Herwanti and Surasni (2017), as well as Santis (2020). Even though the results are different that in other research, the main conclusion with regard to population size insignificance is mostly predominant. Other authors, such as Tran et al. (2018), debate whether the population itself should be used, therefore proposing that full-time employees is probably a more relevant variable in large local units which are characterised by a significant daily fluctuation of population, such as the Tokyo metropolitan area. Santis (2020) even analyses a set of demographic variables as independent variables on their linkage with greater fiscal sustainability in the case of 104 Italian municipalities. However, the author indicates that they should not be the leading variables when establishing models. Sedmihradská and Čabla (2013) try to find the key determinants in the budget inaccuracy of local governments, respective to the revenue fluctuations. Utilising the GMM model, the authors focus on economic variables, such as GDP growth rate, inflation, municipal unemployment, local fiscal situation, and other political variables. In the case of Czech municipalities, higher economic growth and inflation did generate larger revenues, but this leads to frequent budget underestimations.

The revenue generation process at the local level should not be directly linked exclusively to the general economic performance of the national economy. It is fair to say that individual income can also play a significant role. Real income growth per capita is studied for its relationship with the level of decentralisation, measured in revenue percentage of total central government revenue. Hammond and Tosun (2011) focus on the interval between 1970 and 2000 for 48 states in the USA; general results show that a ten-percent increase in revenue centralisation in metropolitan counties generates – in the long run – a decline per capita income growth of 0.28 percent. This relationship is not significant, in turn, with regard to non-metropolitan counties. Similar results can be found in the works of Nelson and Foster (1999). For broader explication on the impact of fiscal decentralisation and its fiscal consequences, work by Martinez-Vazquez et al. (2016) is strongly suggested.

The political climate in local jurisdictions is perceived as one of the most interesting yet impactful factors on local revenues. Usually, the general expectation is that left-oriented governments should generate larger revenues, since it correlates with the high-tax ideology. In the works of Blom-Hansen et al. (2006), the ideology of the ruling party in the municipal council in Norway and Denmark – and even party fragmentation – seem to play a significant role in revenue determination. Leftist ideology has a positive effect on income and property tax in both countries, while no statistically significant effect on user charges is observed in Norway. Similar research was done by Dash and Raja (2014), whose case was 14 Indian sub-central governments. They further extend this topic onto analysing whether the coalition fragmentation, the governing party ideology, and electoral cycles affect local revenue collection. Generally, less fragmented coalitions as well as right-wing ideology governance tend to generate revenues much better, while left-wing governments rely more on internal debt to compensate. Electoral years constitute one of the main determinants for bad revenue performance for sub-central units, since governments are usually not too fond of raising taxes and collecting them in a much more efficient manner in pre-election and election years.

It is safe to say that revenues should depend on municipal welfare. Different economies impose different governance sub-classifications, but general knowledge indicates that urban areas generate a larger proportion of local revenues per capita due to their level of development. Even in our research, we believe that this is an important factor since, it might provide valuable information on revenue divergence across municipalities. Furthermore, this can be applied to a future planning of greater horizontal fiscal equalisation. Unbiased in presenting our beliefs, we suggest work of Moldovan (2016). The author tests whether the type of local administration influences local revenue collection in the specific case of Romania. For the interval between 2008 and 2011, a total of 3,227 territorial administrative units were analysed by the said author. For testing the statistical significance of the targeted variable, variance analysis was conducted through the ANOVA method,

where the level of revenue collection is a dependent variable, while the type of the local unit is an independent variable. Since the Romanian territorial units are segregated into counties, municipalities, cities, communes, and sectors, five hypotheses were tested through the model. The results show that, ultimately, revenue collection is not affected by the type of unit (urban or rural), and thus the mean differences were statistically insignificant for the period of 2008–2011.

As explained, local revenues can be explained by many possible determinants. However, their relationship is not uniform. Our main goal is to present a new way of estimating and revealing the determinants of local revenues in the specific case of North Macedonia. This paper provides clear added value to the literature on the determinants of local revenues as well as it contributes to the debate on fiscal decentralisation in North Macedonia and the broader region of SEE. Furthermore, this can be a clear foundation for further research regarding local revenue determinants.

3. Research

In this section, we present a short summary on the current national fiscal decentralisation level, as well as we demonstrate the used empirical model and the main research findings. Since the research itself is complete only partially, we decided to present the local level development in North Macedonia in order to grasp the idea of using the chosen variables in the research. With this in mind, we have to note that data collection for the sub-central level can be quite a task, considering the level of financial transparency, economic development, and the simplicity in the data collection process in a small post-transitory economy such as the Macedonian one. These problems can be a turning point even when deciding to study this topic, as they can be quite a challenge for extensive, sufficient analyses.

3.1. The structural set-up of the Macedonian sub-central governance

The idea of a decentralisation process in North Macedonia traces back to 2001, even though it did not formally begin until July 2005. It was conceptualised in three phases of a gradual delegation of functions and revenues from the central government to the local level. With this, local governments were set to become fiscally autonomous, reaching the current mild fiscal decentralisation. However, the process of complete decentralisation is far from over. Since the Macedonian economy has a particularly simple structure, its simplicity was retained at the local level, segregating the public governance in two aspects – central and sub-central, i.e. municipal. The local level is divided into 80 municipalities and the city of Skopje acts as a separate unit of local governance (consisting of 10 capital-city municipalities).

Up until 2012, all municipalities except for one (Plasnica) had entered the last phase of fiscal decentralisation. Nevertheless, fiscal disparities are present even today. Each municipality has its own revenues made up of taxes and fees, as well as sets of vertical and horizontal grants and transfers, which create their total revenues. Municipal revenues are structured as follows:

- local taxes (property tax, property transfer tax, inheritance and gift tax, and compensation for regulating construction land);
- shared national taxes (personal income tax (PIT), distributed based on a constant proportion and work categories);
- fees and charges;
- national budget grants (value-added tax-related (VAT), categorical, block, and capital, as well as grants for delegated competencies).

While we will abstract from further explication of the methodologies of distribution, tax rates, and tax bases, we present the structure of local revenues, which are the key objective of our research. Figures 1 and 2 present the structural movements in the different types of local revenues. As can be seen, transfers and donations are accountable for roughly 45-50% of local revenues, signalling their structural dependency on vertical and horizontal transfers. Roughly 6% of total transfers are due to VAT grants, which have a fiscal equalisation role in lowering the disparities between different municipalities. For urban municipalities, the VAT grants are accountable for 7% of total revenues, while for rural ones, this share stands at 12% for 2019 (not presented on the graph). Even greater

fiscal dependency is observed in urban and rural units, except for the city of Skopje. This derives directly from the local capabilities of own revenue collection and administration, especially considering the economic circumstances in each municipality. The city of Skopje generates roughly 37% of total revenues from taxes, as opposed to the especially low levels in other urban and rural municipalities, i.e. 19% and 13%, respectively. Urban and rural areas do not differ too much in their revenue structure. Nevertheless, the total revenues of urban municipalities are roughly four times greater than that of the rural ones. In 2019, the city of Skopje registered almost double the amount of property tax revenues by both urban and rural municipalities independently, and a little less (11%) than all other 80 municipalities combined. Numbers such as these are due to the explicit high concentration of population (between 25-30% of the total, according to the last census from 2002, as well as some forecasts), businesses, investments, etc.

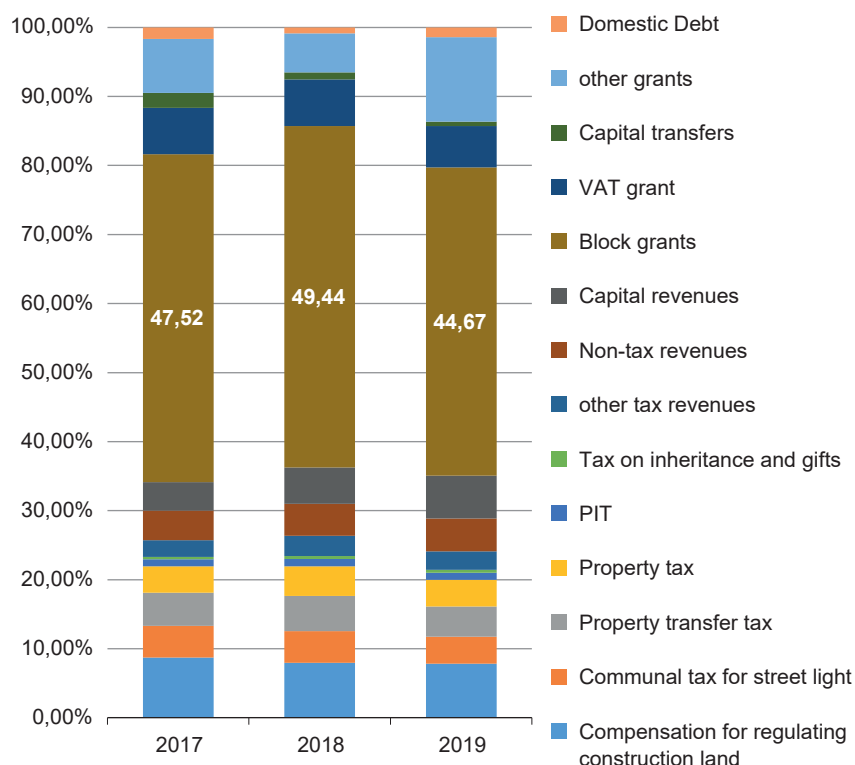


Figure 1. Structural changes in local revenues by type of category, in %, 2017–2019

Source: Ministry of Finance; Authors' depiction.

There are fiscal disparities among municipalities in North Macedonia. Their especially high dependency on transfers and grants initiates the idea of exploring the potential revenue determinants. With this in mind, we ought to estimate the potential factors of influence and, consequently, target any potential loopholes in the revenue generation process by means of specific measures that should be implemented.

In order to better understand the relevance behind testing for political orientation significance, we present the interactive maps of local election results (see Figures 3 and 4). The dramatic shift from the right-oriented government to the left-oriented one is more than evident, and it can be used in attaining important information. A vast number of political parties remain active in the Macedonian case, but even though they originally represent different ideologies in terms of political spectrum, we divide them into left- and right-oriented parties, only to simplify the starting position of research. Nevertheless, three to four major parties govern ~98% of all municipalities in North Macedonia, and none of them tends to be purely centrist, far-left, or far-right. Given such practical circumstances, for the reader's simplicity, left-oriented authorities govern the blue, yellow, and green areas, while the red and purple ones are predominantly right-oriented. The SDSM (Mac. Socijaldemokratski Sojuz na Makedonija) and VMRO-DPMNE (Mac. Vnatresna Makedonska Revolucionerna Organizacija

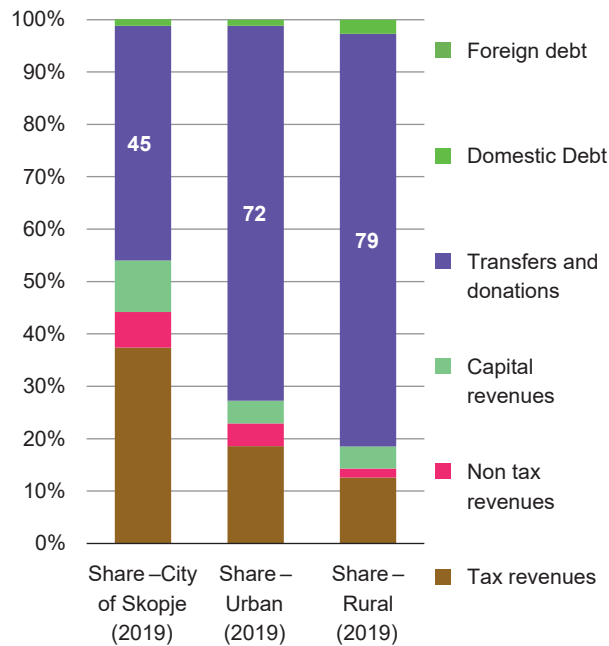
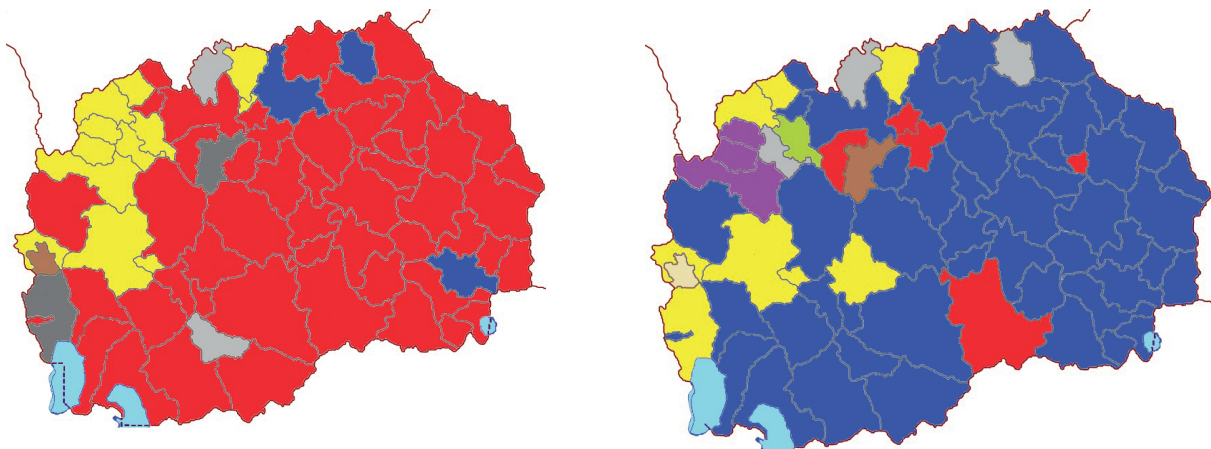


Figure 2. Local revenues by type of municipality, in %, 2019

Source: Ministry of Finance; Authors' depiction.

– Demokratska Partija za Makedonsko Nacionalno Edinstvo) parties represent blue and red, respectively. The yellow, green, and purple colours represent the DUI (Mac. Demokratska Unija za Integracija), BESA, and AA (Mac. Alijansa za Albancite) parties, respectively.



Figures 3 and 4. Local election results, 2013 (left-hand picture) and 2017 (right-hand picture)

Source: State Election Commission; Authors' depiction.

3.2. Data and research methodology

In this section, we will focus on the implemented methodology as well as the usage of available data. For this research, we analysed all municipalities in North Macedonia (80 municipalities and the city of Skopje), with a total of $n=405$ annual observations, covering the period 2015–2019. The arbitrary selection of the sample was made based on the available annual data for each municipality, which is scarce in some cases. Within this analysed interval on October 15, 2017, local elections were held to elect councillors and Mayors in all municipalities in North Macedonia, resulting in a sharp shift in the political orientation of local authorities. Given that even at present, some local jurisdictions remain underdeveloped, such conditions are common in developing SEE economies.

Even though a possibility of estimating an unbalanced panel model is at our disposal, we chose not to take this path, and we worked with a sample period that enables the use of balanced panel regression, mainly due to greater estimation power. Data on own and tax revenues and their determinants were collected manually from municipal reports and Gazettes available on their websites, as well as from the Ministry of Finance of North Macedonia, all of which was calculated concerning each municipality's population. Municipal revenue indicators (i.e. own revenues and tax revenues) are set independently as a function of key factors, such as capital expenditures, salary expenditures, active transparency index, municipality type (urban or rural), and local government ideology (right- or left-oriented). All the used variables were adjusted according to the number of inhabitants in the respective municipalities in order for us to be able to uncover the impact of the determinants of municipal revenues in a more realistic way. Own revenues and tax revenue are taken as municipal revenue measures. As to our main approach in the econometric analysis, we use the panel regression model which takes the following general form:

$$Y_{it} = \alpha + \beta X_{it} + u_i + \lambda_t + v_{it} \tag{1}$$

Here, the notation accounts for the unobserved individual effects (as all entities are presumed not to be homogenised in reality), with $i = 1, 2, 3, \dots, N$, and the λ_t indicating the unobserved time specific effect, with $t = 1, 2, 3, \dots, T$. These parameters, alongside the random error, can be represented as a composite parameter innovation. As this intercept term is also time-invariant, it accounts for the random effects of each separate entity used in the model. Based on the previously stated, the general random-effects panel regression model can be presented as:

$$Y_{it} = \alpha + \beta X_{it} + \varepsilon_{it} \tag{2}$$

The general panel model is represented by the following notations:

Y_{it} represents the dependent variable,

α is the constant intercept,

β is a $(k \times 1)$ matrix of coefficients to be estimated,

X_{it} is the time-variant $(1 \times k)$ regressor vector (both independent and dummy), and

ε_{it} is the error term where $\varepsilon \sim N(0, \sigma^2)$.

Two separate models were estimated, namely:

$$\Delta OR / Pop_{it} = \alpha + \beta_1 \Delta CAPEX / Pop_{it} + \beta_2 \Delta WEX / Pop_{it} + \beta_3 \Delta T_{it} + \beta_4 U_{it} + \beta_5 POL_{it} + \varepsilon_{it} \tag{3}$$

$$TR / Pop_{it} = \alpha + \beta_1 \Delta CAPEX / Pop_{it} + \beta_2 \Delta WEX / Pop_{it} + \beta_3 \Delta T_{it} + \beta_4 U_{it} + \beta_5 POL_{it} + \varepsilon_{it} \tag{4}$$

Both total and own revenues are observed individually as functions of the indicated independent and dummy variables, i.e.:

$$OR = f(CAPEX, WEX, T, U, POL) \tag{5}$$

$$TR = f(CAPEX, WEX, T, U, POL) \tag{6}$$

The two dummy variables accounting for the urbanisation and political effects take binary values:

$$U = \begin{cases} 1, & \text{if the municipality is classified as urban} \\ 0, & \text{otherwise} \end{cases} \tag{7}$$

and

$$POL = \begin{cases} 1, & \text{if local government is represented by left - oriented party} \\ 0, & \text{right - oriented party} \end{cases} \tag{8}$$

The explanation of model variables, the measurements, and the theoretically-expected impact on own and total municipal revenues are all presented in Table 1.

Table 1. Model variables

Notation	Variable	Expected sign
OR	Municipal own revenues, per capita, in MKD	/
TR	Municipal total revenues, per capita, in MKD	/
CAPEX	Municipal capital expenditures, per capita, in MKD	+
WEX	Municipal salary expenditures, per capita, in MKD	+
T	Active Transparency Index	+
U	Urban municipality, dummy variable	+
POL	Left-oriented municipal government, dummy variable	+

Source: Authors' depiction.

Capital expenditures (CAPEX) are one way in which funds are spent from municipal budgets. They imply long-term effects on the municipality's growth and development in terms of both increasing resident welfare and generating higher future revenues. The general assumption is that capital expenditures would positively affect revenue generation by local governments. According to the Rulebook on Classification of Expenditures (Ministry of Finance 2009), salary expenditures (WEX) are classified as current expenditures. Given that salary expenditure and expenditures on goods and services have the largest share in the structure of current expenditures in most municipalities, we logically expect that municipalities with a large number of employees spend more on these categories, offer better services, and even collect significantly more revenues. Since part of local individuals work in the municipal administration, they tend to have their disposable income greater as municipal salary expenditures rise. Maintaining a *ceteris paribus* situation for the individuals working in the private sector, a greater proportion of disposable income naturally should increase the aggregate demand and economic activity. Data on capital expenditures and salary expenditures was collected from the Official Gazettes of the respective municipalities between 2015 and 2019.

Modern-day discussions and policy-shaping inevitably include public information disclosure, i.e. communicating with both the media and the citizens. Such activities are uniform regarding municipal transparency, as they play an active and key role in operating and maintaining their delegated functions. Local transparency is perceived as essential, and, according to Kroth (2012), it entails:

- monitoring local government practices, which are especially important for resource allocation and provision of services;
- revealing gaps in public financial management at the local level, and creating the potential for reduced corruption and management errors;
- monitoring the financial flows from their source to the destination of usage;
- increasing public accountability for issues of public interest;
- stimulating and increasing civil activity and public debate;
- monitoring and assisting in controlling local borrowing;
- making national-level comparisons and encouraging competition at the inter-local level.

These notations mean that the expectation of a positive regression coefficient is justified. In the analysis, we use the municipalities' active transparency (T), which means publishing information on their initiative, i.e. without anyone submitting a request for access to that information. According to the Law on Free Access to Public Information, there is a legal basis for active transparency of institutions. Active Transparency Index data is provided by the Report prepared by the Centre for Civil Communications for the respective years (Centre for Civil Communications 2016, 2017, 2018, 2019).

Below are the descriptive statistics for the data used in the analysis. Our balanced sample contains 405 observations. In own revenues, tax revenues, and capital expenditures per capita, the arithmetic mean and the median differ significantly. Such a difference can be explained by the fact that these series are positively asymmetric (according to the Skewness statistics) and more peaked than normal (according to the Kurtosis statistics), which means that 'outlays' affect the arithmetic mean more than the median, which can be observed through heavier tails of the distribution. The

same parameters differ less for the salary expenditures and the active transparency index, which are moderately negative-asymmetric. The standard deviation of the series is high, indicating the persistence of large discrepancies between municipalities. In addition, the intervals of variation of the data are quite large for each variable. In consequence, the Jarque-Bera statistics as a test of normality shows that the series are not distributed normally.

Table 2. Descriptive statistics

	Own Revenues per capita	Tax Revenues per capita	Capital Expenditures per capita	Salary expenditures per capita	Active Transparency Index
Mean	3,839.525	2,328.34	3,164.559	6,885.615	44.096
Median	3,059.35	1,809.95	2,402.339	6,949.368	46.3
Maximum	18,306.33	9,546.144	19,841.57	12,484.36	88.1
Minimum	386.018	281.277	302.278	1,271.532	0.000
Std. Dev.	2,971.134	1,653.462	2,668.544	1,611.539	22.329
Skewness	2.209	1.842	2.503	-0.195	-0.129
Kurtosis	8.887	6.898	11.431	4.861	1.98
Jarque-Bera	914.156	485.334	1,622.176	60.995	18.67
Probability	0.0000	0.0000	0.0000	0.0000	0.0001
Sum	1,555.008	942,977.7	1,281.647	2,788.674	17,859
Sum Sq. Dev.	3.57	1.10	2.88	1.05	201,419.5
Observations	405	405	405	405	405

Source: Authors' calculations.

Finally, the empirical model contains two dummy variables representing the municipality type (urban or rural), and the local government's political orientation (right- or left-oriented). The aim is to determine whether, and to what extent, urban municipalities collect more revenue than rural ones, and whether this difference is significant. Based on the papers mentioned in Section 2, the local government's ideology significantly influences revenue collection from municipalities. In our sample, 51.9% of the municipalities (42 out of 81) are registered as urban, while 48.1% (39 out of 81) are rural municipalities. Before the local elections in 2017, 75.3% of the municipalities had a local government with a right-wing orientation, opposing the 24.7% left-wing local government. The local elections in 2017 proved to be a significant shift in the political structure. At the time of this analysis, as many as 85.2% of the municipalities are run by a local government with left-wing ideology, and only 14.8% by right-wing candidates.

The revenue determinants are analysed using the random effects method, since the number of cross-members in our sample is far greater than the time interval. Given that the random-effects method involves estimating a smaller number of parameters (no dummy variables or within transformation to perform), a degree of freedom is preserved. As a result, the random-effects model should produce a more efficient estimation than the fixed-effects approach (Brooks 2014). Formally, the Hausman test results (Hausman 1978) show just the opposite, but in order to preserve the degrees of freedom and due to the lack of additional data to expand the sample – we decided to preserve the random-effects approach in our modelling.

4. Results and discussions

The results of the random-effects panel model were calculated with the Generalized Least Squares (GLS) method. The first model (presented in Table 3) shows the determinants of the municipalities' own revenues, while in the second model, the calculations are made respective to the municipalities' total tax revenues. After the brief explanation and discussion of the results,

the standard summarising tables show the estimated regression coefficients, standard errors, t-statistics, and p-values.

As can be observed, capital expenditures, active transparency index, and the municipality type all significantly affect municipal own revenues. All statistically significant regressors have the theoretically expected sign. In the analysed period, the increase of capital expenditures by one MKD (Macedonian Denar) on average increased municipal own revenues by 0.39 MKD per capita. This relationship is observed to be statistically significant even at the 1% level. The provision of capital goods, such as infrastructure and public goods, proves to be of great importance. In this particular case, as municipalities tend to spend more, they generate more budget revenues. However, it is evident that such relationship is positive but less than proportional, implying a weaker link. Since the estimated parameter is found in the range of $0 \leq \beta_1 \leq 1$, it restricts own revenues in generating a steady growth. Such circumstances imply that even though a positive relationship is observed, obtaining a larger pool of own revenues based on capital expenditures is financially unsustainable.

The above-mentioned benefits of increased transparency are fully reflected in the results. Improving transparency by one index point increases own revenues by an average of 10.88 MKD per capita. This confirms our thesis that in the municipalities where the citizens are transparently informed about the activities and the results of the work of the local self-government, more local revenues are paid/collected. Such information can be of particular interest to policy-creators and governing structures. Both theoretically and practically, the increase in public institution transparency raises overall trust in that institution. Increased participation at different levels in the community by the stakeholders is observed. This eventually leads to lower levels of corruption and tax evasion. Besides, benefits are clearly visible, such as more efficient local management and macroeconomic stability.

In our sample, the urban municipalities collected on average 1,422.94 MKD per capita more than the rural municipalities. This indicates that the type of municipality has a significant impact on the structure of own revenues throughout different municipalities. This is partly due to the different fiscal capacity and the ability to collect different types of local revenues in urban versus rural municipalities, while on the other hand, it is often due to the modest institutional capacity available primarily to rural municipalities and their lower efficiency in collection of own local revenues (one example is the lack of tax inspectors in more than half of rural municipalities in northern Macedonia). Such findings oppose the research of Moldovan (2016), which showed, e.g., that the Macedonian and the Romanian cases cannot be treated as equal. If we hypothesise that the level of urbanisation and the population size are highly correlated, our findings are also contrary to other empirical results (e.g. Blom-Hansen et al. 2006; Hadiyan et al. 2017; Santis 2020). These premises are maintained even in the second model. As we confirm the theoretical expectation prior to this research, important advice for policy-creators can be drawn. The presence of fiscal disparities among municipalities indicates the importance of horizontal equalisation in the process of decentralisation. Such discrepancies ought to be more evident in SEE economies rather than in Western Europe. Even though the local government has the adequate jurisdictions on their territory, we believe that a sustainable and efficient horizontal equalisation throughout municipalities can be reached only by the central government's intervention. However, potential hazards with regard to the agent problem might arise if central government intervention is regarded as unconditional.

On the other hand, per capita salary spending and the political ideology of the local government are not statistically significant. This clearly shows that it does not mean that those municipalities that have a larger number of employees and pay higher amounts for salaries provide more/better local services and that they collect a larger amount of local revenues. Low political awareness and the culture of various ideologies of the representatives of the central and local governments might also be the reason behind the estimated relationship. The absence of fundamental division of left- and right-oriented governments which will take care of the implementation of the principles of the ideologies themselves (funding most local policies on pragmatism) seems to be one of the core political downsides in the Macedonian political constellation. Although the informal division between right-wing and left-wing parties persists, its formal inclusion in the Macedonian political case generates results that are opposite to Indian (Dash and Raja 2014) as well as Norwegian and Danish cases (Blom-Hansen et al. 2006) in terms of significance.

Table 3. Model 1 – results (own revenues per capita)

Variable	Coefficient	t-Statistic	Prob.
Capital Expenditures per capita	0.387*** (0.034)	11.397	0.0000
Salary Expenditures per capita	0.131 (0.093)	1.403	0.1613
Active Transparency Index	10.880** (5.388)	2.019	0.0441
Municipality Type (Urban = 1)	1,422.940*** (354.975)	4.009	0.0001
Local Government's Political Ideology (Left = 1)	-142.726 (135.789)	-1.051	0.2939
C	581.679 (642.103)	0.906	0.3655
R-squared		0.2635	
F-statistic		28.5437	
Prob. (F-statistic)		0.0000	
Effects Specification			
	S.D.	Rho	
Cross-section random	1,356.825	0.5838	
Idiosyncratic random	1,145.542	0.4162	

Note: ***/**/* indicates 1%, 5% and 10% statistical significance, respectively.

Source: Authors' calculations.

Regarding the second model of tax revenues per capita within the municipalities, we can say that similar results were obtained as those of the model with own revenues. Capital expenditures, active transparency index, and the type of municipality are statistically significant, while the salary expenditures and the local government's political ideology are statistically insignificant in terms of tax revenue collection. Both statistically significant and non-significant regressors have the expected sign. For the period of interest, we found out that the increase of capital expenditures by 1 MKD per capita on average increases the tax revenues of the municipality by 0.05 MKD per capita, while being statistically significant at the level of 1%. Having in mind that the increased index of active transparency by one index point increases the tax revenues by 7.08 MKD per capita in the examined period, we may conclude that the municipalities in North Macedonia should take care of the transparency process as much as possible, since it plays a vital role in generating municipal revenues.

Regarding the two dummy variables, i.e. the type of municipality and the political ideology of the local government, we may conclude that, firstly, urban municipalities obtain more tax revenues from their residents than rural municipalities do. Rural units, as expected, rely much more on central-government transfers, contrary to areas which are highly urbanised. Furthermore, left-oriented local authorities collect more tax revenue than right-winged ones, but in our case, this is statistically insignificant due to the problems mentioned in the previous section. As observed, expenditures on salaries per capita also do not significantly affect the tax revenues of municipalities in the second estimated model, which is consistent with the previous one. As presented in Tables 1 and 2, both models indicate a significant and positive relationship between the dependent variable (total tax or own revenues) and the variables such as capital expenditures, the level of municipal transparency, as well as their type, i.e. their level of urbanisation. Considering this, own revenues (Model 1) indicate a greater reaction than total tax revenues (Model 2).

Table 4. Model 2 – results (tax revenues per capita)

Variable	Coefficient	t-Statistic	Prob.
Capital Expenditures per capita	0.053*** (0.015)	3.651	0.0003
Salary Expenditures per capita	0.081 (0.063)	1.297	0.1955
Active Transparency Index	7.082*** (2.443)	2.899	0.0039
Municipality Type (Urban = 1)	1,018.125*** (308.129)	3.304	0.001
Local Government's Political Ideology (Left = 1)	27.342 (57.140)	0.479	0.6326
C	743.088* (448.568)	1.657	0.0984
R-squared		0.1018	
F-statistic		9.0489	
Prob. (F-statistic)		0.0000	
Effects Specification			
	S.D.		Rho
Cross-section random	1,337.11		0.8966
Idiosyncratic random	454.023		0.1034

Note: ***/**/* indicates 1%, 5% and 10% statistical significance, respectively.

Source: Authors' calculations.

5. Summary and concluding remarks

The relatively simple two-level fiscal model makes the Macedonian case of decentralisation especially intuitive and easy to analyse. Since it is a successful decentralisation story in the region, we believe that it deserves more attention in future research. An evident gap is present in modern-day studies in terms of revenue determinants, their impact on own revenues, as well as an analysis of the SEE economies, which can be widely understood as post-transitional or incomplete-transitional economies. Most of the academic literature focuses purely on general economic variables or some reoccurring determinants, which is decisively avoided in our case. The relatively late beginning of the decentralisation process, including its slow catching-up pace, might be one of the reasons for the absence of empirical findings. Nevertheless, with our research, we aim to fill part of this gap and provide concise benefits.

Through our two-model panel regression approach, we obtained some interesting findings in the case of 80 Macedonian municipalities and the capital city of Skopje for the period between 2015 and 2019. We can conclude that variables such as capital expenditures, active transparency index, and the level of urbanisation of each municipality are helpful and significant in determining local revenues, specifically tax and own revenues. Through these results, we point out the major empirical findings. In this context, the greater capital expenditure policy at the municipal level helps promote constant growth and development. Such economic movements help in maintaining stable and growing taxes and own local revenues.

The inclusion of the Active Transparency Index in our models and the obtaining of significant estimates confirms the pre-set theoretical hypothesis as to the importance of municipal fiscal transparency. Notably, transparently disclosing information of public importance to all stakeholders helps general economic transparency, cooperation, as well as lowering tax evasion on the local level. After all, economic agents and residential households do care about their tax spending, and so they respond accordingly.

Even though some of the previous empirical findings oppose this hypothesis, we find a significant and positive relationship between the dependent variables and the type of municipality (based

on its urbanisation). As a consequence, own and tax revenues of Macedonian municipalities depend on the level of urbanisation, which is highly correlated with the scope of the resident population, economic activity, both domestic and foreign investments, as well as fiscal capacity of such urbanised municipalities. Contrary to our theoretical beliefs and expectations, salary expenditures and the political ideology of the governing party in each municipality do not play a significant role in revenue determination.

Finally, we can note that the search for meaningful local revenue determinants is far from over. Of course, this paper can be an important foundation for any future research which might include a greater scope of possible determinants of local revenues. The unobserved factors of influence are deemed to be especially vast, which is why drawing a definite conclusion from a small subset cannot be made. However, it can help us better understand the definite process, which is the key component when incorporating new policies. The presence of limitations in similar research is strongly dependent on the availability of relevant data for the municipalities in developing economies (such as North Macedonia), which could be overcome if municipalities focused on transparency and information disclosure more actively in the years that follow.

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