

## **Impact of COVID-19 Pandemic on Local Finance and Development Strategies. Case of Urban and Rural Areas in the Mazovia Region**

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**Abstract** The paper aims to investigate the economic consequences of the COVID-19 pandemic through the prism of local finances in the Mazovia region. The rationale for this research comes from the observation that lockdown and a reduced economic activity affect revenues of local budgets. Thus, a question arises about the effect of decreased local budgets on local expenditure and the implementation of development strategies. The method applied was a survey carried out on a sample consisting of all the local administrative units (LAU) in the region. The results show that the "scissors effect" of rising expenditure and falling revenues applies to all the LAU. The analysis provides evidence that the characteristics of urban and rural LAU have consequences not only for their resilience against the COVID-19 pandemic but influence their strategies and actions adopted in response to the crisis.

**Keywords:** • COVID-19 • local government • local budget • local development • local self-government • urban and rural areas

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## 1 Introduction

There are several reasons creating background for the research presented in this article. According to the OECD (OECD, 2020a), the COVID-19 pandemic has got a strong territorial dimension with significant policy implications for managing its consequences. A significant body of research on the impact of the COVID-19 pandemic on the economy focuses on the macro level, but it is the local level that matters for the inhabitants. The performance of variety of public services depends on local finances. Based on this observation, the aim of this article is to investigate the impact of the pandemic on local finances and local development strategies, taking into account the differences between the types of local governments: rural, urban-rural and urban local administrative units (LAU).

Consequences of the COVID-19 pandemic have clearly demonstrated that we are dealing with a crisis that is regional by nature. To quote Dodds et al. (2020), pandemic has revealed that “we are not all in it together”. Its impact on health and economy is unevenly distributed geographically, sometimes even with greater variations within countries than between them (Bailey et al., 2020). It seems that the scope of consequences of the current pandemic is region specific. Interregional inequalities have risen over last decades, with trends changing from convergence to divergence (Bailey et al., 2020; Nocco, 2005, Kemeny & Storper, 2020; Ezcurra, 2020; Rosés & Wolf, 2018) and pandemic may intensify this problem. The case of Italian economy (Ascani et al., 2020) proves that special unevenness of pandemic’s impact is connected to the economic base of localities and that local economic specialization acts as a vehicle of disease transmission. Therefore, the impact of the pandemic depends not only on the spread of the virus but also on the structure of the economy. Similar results have been obtained from the analysis of British economy (ICAEW, 2020) where vulnerability to economic effects of the pandemic is associated with differences in sectoral performance in combination with regional variation. An analysis of territorial economic impact of COVID-19 in the EU regions (Conte et al., 2020) proved that both supply and demand shocks hit all EU regions symmetrically. However, given different initial endowments and economic characteristics of the regions, the response was differentiated and asymmetrical. Uneven geographic distribution of the economic impact of the pandemic is also caused by regional disparities in factors such as: the presence of manufacturing, hospitality and tourism sectors, degree of exposure to international trade, levels of poverty and inequality, proportion of informal workers and micro-firms in local economy (Mooney & Zegarra, 2020).

In this context, the aim of this study is to investigate the impact of the Covid-19 pandemic on rural, urban-rural, and urban LAU finances, as well as their development policies and strategies. This goal is reflected in the following research questions: (1) What are the main channels for the impact of the pandemic on LAU

finances, both on the income and expenditure side? (2) What is the balance of the debt effects for LAU budgets described in the first question? (3) How do pandemic-induced changes in LAU finances affect LAU development strategies and policies? (4) Are differences in the structures of rural, urban-rural, and urban LAU economies reflected in the effects of the pandemic on LAU's finance and development strategies?

Our research strategy is to use quantitative data for Mazovia region in Poland obtained through CAWI / CATI interviews with LAU officials. The survey questionnaire was based on hypotheses that were built on the basis of the literature review presented in the next section. Using the quantitative analysis of the collected data, we verify the hypotheses and answer research questions. In addition to quantitative research strategy, aiming at pointing when and where observed phenomena occurred, we also used elements of analytical research strategy, to deal with the cause and effect relationship. It is used to address the relation of income and expenditure effects of COVID-19 on LAU budgets and strategies.

We chose Mazovia region as a case study for our research due to the structure of its economy and characteristics of regional development. On the one hand, the region includes Warsaw, the capital city of Poland with all functions that its role entails. Warsaw is a hub for business support services and the economy of this city is strongly tilted towards this sector. On the other hand, other areas of the region are mainly agricultural with some manufacturing hubs. The dichotomy is seen not only in the importance of sectors of economy but also in the wealth of the sub-regions. Therefore, Mazovia appears to be a good region to test hypotheses on urban-rural differentiation in vulnerability to the COVID-19 shock and responses to it. Moreover, Mazovia with its characteristics may represent other capital regions in Central and Eastern Europe. These regions underwent dynamic economic development concentrated in metropolises as growth poles, which contrasted with the weaker dynamics of rural areas development.

Within the Polish administrative structure, Mazovia is a voivodeship divided into two NUTS2 regions: the capital city of Warsaw and Mazovian regional. Our analysis was, however, conducted at a lower level of administrative units in order to consider the urban-rural specificity. These units are further referred to as LAU, in line with the EU nomenclature.

In the context of the Covid-19 pandemic, it should be noted that LAU budgets were put under pressure in the entire CEE region - both on the revenue and expenditure side. Thus, the experiences and strategies undertaken in Mazovia can be generalized to other CEE regions. Thus, the study may provide a better picture of the geography of the COVID-19 impact by presenting the urban-rural differentiation in local government responses. It adds to the growing body of literature that explores the

consequences of the pandemic, as most of the studies on the COVID-19 crisis impact focus on the central government level (Nemec & Špaček, 2020).

## 2 Literature overview

Even though the COVID-19 impact is to a large extent regional and geographically diversified at sub-national level, most of the resources focus on the response to crisis provided by the national level (Emergency Governance Initiative, 2020). To fill in this gap, LSE conducted an analysis of online resources concerning governance challenges in regions and cities, concluding that they mostly relate to administration, technical management and innovation, out of which the challenge of public finances was most frequently emerging. As far as development strategies at sub-national level, and impact of pandemic shock on this area are concerned, results of the analysis also point to finances (insufficient budgets and uncertainty of funding) as the most pressing issues. A more detailed study (Emergency Governance Initiative, 2021) broadened the spectrum of sub-national finance-related challenges to those stemming from new demands for services and investments.

Effects of the COVID-19 crisis at local and regional level include also severe re-organization of local budgets. Since large share of government service provision, especially those related to health crisis response, is administered at local and regional level (Green & Loualiche, 2021), local governments are facing the challenge of increased expenditures. The pressure to increase spending in the areas of health protection, public safety, and education meets with the large losses in revenues (Emergency Governance Initiative, 2020, 2021; Green & Loualiche, 2021; Kochanov et al., 2020). The fiscal challenge stems from the pandemic-induced demand for public services coinciding with decline in tax revenues collected at the local level. The impact is estimated worldwide (Chernick et al., 2020; Emergency Governance Initiative, 2020, 2021) as a 5% increase in expenditure and ca. 5% - 10% decrease in revenue. One of the observed consequences might be through the labor market in the form of jobs lost in the public sector (Green & Loualiche, 2021). Another result, given the balanced budget requirement in local finance, is borrowing but in most countries there are restrictions on sub-national government borrowing (Kochanov et al., 2020). Majority of LAU, however, fill this gap by postponing investment in, e.g., infrastructure, environment, and housing.

The survey conducted by the OECD and the European Committee of the Regions among the representatives of regional and local governments in 24 countries of the European Union revealed that the majority of subnational governments predict the decrease of revenue (as a consequence of lockdowns) and rising expenses resulting from policy measures in the public health and social policy (European Committee of Regions, 2020; OECD, 2020a, 2020b). Similar results were presented by Nemec

& Špaček (2020), who investigated financial consequences of COVID-19 in Czech and Slovak municipalities. The local governments in these two countries may not have enough resources to carry out their tasks and responsibilities due to significant increases in expenditure and even more significant revenue decreases.

When it comes to the loss in revenues at a sub-national government level there is a rapidly growing body of literature, forecasting the scope of the impact and the scale of the shortfalls (Chernick et al., 2020; Kochanov et al., 2020). A study of NBER (Clemens & Veuger, 2020) estimates that decrease resulting solely from sales and income tax will in 2021 amount to 0.5% of GDP in American states. Whereas the challenge of the COVID-19 crisis impact on local revenues may vary depending on the level of fiscal decentralization, the most commonly observed tax revenue losses include: lost sale tax, deferred tax payments, and decreased income and property taxes. Other lost sources of revenue include: revenues from public transport companies, water and waste treatment companies (Kochanov et al., 2020). Given the structure of revenues of Polish local administration units, all of the above channels of influence are quite likely to materialize. The above observations taken from various local economies, diversified with regard to geographical location, structure of economy and administration have led to the hypothesis that COVID-19 has decreased local government revenues in LAU in the Mazovia region (Hypothesis 1).

Apart from revenues, also local government expenditure is a tool that significantly affects development and economic potential of long-term growth. Expenditure of territorial self-government entities covers mainly the current expenditure of budgetary entities. In 2019 the current expenditure constituted 83% of the total expenditure of LAU (Rada Ministrów, 2020). The remaining part was the property expenditure (17%), of which almost 99% is investment. The majority of the expenditure is on salaries and wages including compulsory social security payments (37%). Benefits for natural persons are the second biggest category (31.5%). Allocations constituted 7% and the debt service was 0.7% (Rada Ministrów, 2020). LAU expenditure included mainly the expenses of the educational sector. In the context of these proportions, important implications are also created by the multiplier effect of subnational government spending (Clemens & Miran, 2012).

During the COVID-19 pandemic, local governments have been on the frontline of managing economic effects of health crisis. Areas of larger spending are identified in detail, i.a., in LSE (Emergency Governance Initiative, 2020, 2021) and Deloitte (2020a) analyses as: waste management, water treatment, public transport, education, child care, organizing remote work of employees. However, Belz and Sheiner (2020) reminds that any changes to the structure of LAU expenditure may only occur gradually due to the existing contract obligations. Therefore, under the circumstances of declining revenues local governments must find more cost

efficient ways to ensure the provision of public services or limit their scope (Benton et al., 2020). In line with these empirical analyses, we expect that COVID-19 related policies will result in the adjustments in LAU expenditure patterns, including the increase of current expenditure and limiting long-term investment (Hypothesis 2).

The pressures of dropping revenues and increased spending placed a severe fiscal squeeze on local governments. We predict that the net effect of changes in income and expenditure will increase LAU debt (Hypothesis 3). In the absence of sufficient central government assistance, local governments are risking running deficits in their operating budgets (Douglas & Raudla, 2020). As argued by Sánchez and Wilkinson (2020) and Cipriani et al. (2020), this effect may be multiplied. However, approaches to closing the budgetary gap may vary (Deloitte, 2020b): from traditional ones, such as using rainy-day funds, reducing workforce and services, through structural like policy changes, consolidating local governments, eliminating unnecessary activities, to the acceleration of digitalization (automation technologies, use of apps, digital transformation).

Following the recommendation of policy changes, we also argue that local development strategies need to be adjusted (Hypothesis 4). In the area of strategic response to the impact of the pandemic on regional/subnational economies, one of the limitations is brought by the fact that local governments are to a great extent responsible for financing sectors where demand is inelastic. Furthermore, subnational governments operate in areas where demand is increasing in the times of health crisis. These circumstances, in conjunction with revenue volatility and insufficient budgets create the “scissor effect” of increasing expenditures and simultaneously decreasing revenues. Strategic response in these conditions may include adjusting local development strategies, resulting from difficulties in the financing of projects included in current strategies. Possible responses may include finding new sources of funding (Sandford & Muldon-Smith, 2020) or revenue diversification (Shon & Kwak, 2020). The World Bank (2020) also advises adapting institutional and financial management in order to cope with the fiscal challenges of COVID-19. Response plan for local governments may be operationalized as: defining essential services, targeting variable costs by reducing non-essential services and cutting discretionary spending, more effective use of existing resources, and mitigating impacts on cash flow by divesting non-essential assets and borrowing (Deloitte, 2020a). As we argue (in Hypothesis 4) some strategic response is unavoidable.

With regard to urban-rural divide, the COVID-19 pandemic reveals large discrepancies. Factor contributing the most to such geography of pandemic is clustering observed in cities. Density, a characteristics that is fundamental to economic activity in cities also makes them the most vulnerable to the spread of the virus (Economic Observatory, 2020). Case studies from the American economy

(Muro et al., 2020) prove that areas of large economic importance to the nation's economy are at the same time the places that cope with the greatest burden of the pandemic. Vulnerability of urban areas to COVID-19 consequences is attributed to four factors (Economic Observatory, 2020): density, connectivity, crowded living conditions, and exposed occupations, all of which not only constitute the economic strength of cities but are also tangled together. Density is correlated with the COVID-19 impact (Cortright, 2020); however, a more precise analysis shows that the issue is more complex: density may be increasing area's vulnerability to COVID-19 cases but only in connection with low income. The issue of overcrowding as a contributor to pandemic spread is also brought up in research of England's households (Maher et al., 2020).

Based on the above analysis and observation, we therefore argue that due to differences in the structure of economies and budgets of rural, urban-rural, and urban LAU, effects of COVID-19 may vary depending on the type of LAU (Hypothesis 5).

The economic structure underpins the differentiation of the impact of pandemic on urban and rural economies. Urban jobs are more likely to require face-to-face interactions as those economies are more dependent on the service sector and polarized around high-wage knowledge-intensive work and low-skilled service jobs (Autor, 2019). However, past crises have proven rural economies resilience and adaptability (Phillipson et al., 2004, 2020). Unlike urban areas, the geography of COVID-19 economic impact might create opportunities for rural areas. OECD (2020c) pointed to several shifts associated with migration flows towards suburbs and rural areas, as well as an opportunity to accelerate digital transformation in rural regions. Possibilities created by remote work and the proliferation of working from home may encourage some groups, in particular 'knowledge workers' to move out of urban areas. Long-term effects of this shift might improve the wellbeing (shorter commuting time) or reduce it (by drop in social capital) (Economic Observatory, 2020). It is also predicted (Delventhal et al., 2022) that remote working might cause decline in urban housing costs, allowing lower-paid workers to relocate to the core of the city.

The temporary relocation of urban dwellers to rural areas may in a short-term bring benefit of shorter commuting time and fall of real estate prices in a medium-term. It must be, however, accompanied with digital transformation and technology deployment in rural areas. Other long-term changes in rural areas ignited by remote work, distance-learning, and healthcare e-services include: acceleration of transition towards low-carbon economy, reshoring of strategic industries that were once delocalized, development of local products and destinations, strengthening local networks and co-operative structures. Long-term consequences of COVID-19 for

rural areas may include acceleration of firms substituting capital for labor in order to reduce vulnerability for future shocks (Phillipson et al., 2020).

As pointed out by the OECD (2020b, 2020d), the financial consequences of the COVID-19 pandemic at the local level are significant due to policy responses (e.g., emergency economic and social measures) and the necessity to act in the context of great uncertainty and under heavy economic, fiscal and social pressures.

Summing up, based on the above literature review in this paper we are testing 5 hypotheses, referring to the impact of the COVID-19 pandemic on local finance and local development strategies of self-governments:

Hypothesis 1: COVID-19 has decreased local government revenues in LAU in the Mazovia region, mainly through lost sources of revenues from public transport, water and waste treatment, and various kinds of tax.

Hypothesis 2: COVID-19 related policies will result in the adjustments in LAU expenditure patterns, including the increase of current expenditure and limiting long-term investment expenditure.

Hypothesis 3: The net effect of changes in income and expenditure will increase LAU debt.

Hypothesis 4: Following the recommendations of policy changes, we expect the local development strategies to be adjusted.

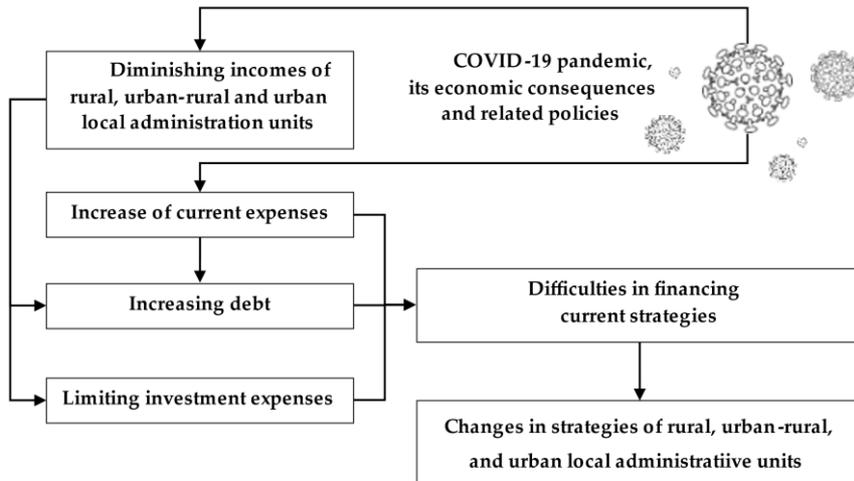
Hypothesis 5: Due to differences in the structure of economies and budgets of rural, urban-rural, and urban LAU, effects of COVID-19 may vary depending on the type of LAU.

### **3 Research**

#### **3.1 Research logic, method and data**

The research logic relies on the observation that greater social distancing became a key goal of policy measures aimed at limiting the transmission of COVID-19. As mentioned above, the interdependencies described in the hypotheses of the research were reflected in the research logic presented in Figure 1. A survey questionnaire was prepared to test these hypotheses. The questionnaire consisted of seven questions of which four were single choice questions, three Likert type scale questions, and one open-ended question. In order to check the differences in the effects of Covid-19 for various LAU types, an ANOVA test of variance was performed.

Data on total population, response rates, and margin errors for all surveyed LAU and various types of LAU are presented in Table 1. The number of Local Administrative Units in the Mazovia region reaches 316, which represents total population. The survey was sent to all these entities. The response rate in this general population was relatively high and reached 42.1% meaning 133 LAU returned the questionnaires. Such high response rate was achieved thanks to an official letter from the Marshal of the Mazovia region encouraging to the participation in the research, which was sent to respondents before interviews. The link to the CAWI questionnaire was sent by e-mail to each of the LAU representatives. It was then confirmed by telephone. This procedure was repeated in the absence of a reply. It was also possible to complete the questionnaire by means of a telephone interview (CATI) conducted by research assistant. The survey was conducted as part of a policy research project (Mazovia 2.0) carried out by the self-government of the Mazovia region, about which the respondents were informed when they were asked to fill in the questionnaires. The questionnaire was targeted at LAU officials, representatives of local administration management. Therefore the answers to survey questions presented official opinions rather than personal ones. It proved to be especially important in case of questions regarding net effect of revenue and expenditure changes, and future LAU development strategies. The population of respondents consisted of: 41 city presidents and mayors in urban and urban-rural areas, and 95 heads of rural LAU. The structure of the sample reflects the structure of the total population by types of LAU. Urban LAU represented 11.7% of the total population and 13.5% of the sample. Urban-rural LAU represented 17.1% of the total population and 15.0% of the sample, while, rural LAU represented 71.2% of the total population and 71.4% of the sample. Due to the structure of the total population, despite relatively high and similar response rates for the various LAU types, the number of questionnaires returned by urban and urban-rural LAU was low, which resulted in higher margin errors in the results for these two LAU types. The margin error of the survey results for the entire population for significance levels from 90% to 70% ranges from 5.45% to 3.44%. The margin error for rural LAU results for the 90% to 70% significance levels ranges from 6.63% to 4.18%. As mentioned above, the number of urban and urban-rural LAU is low. As a result, even at high response rates, the margin errors for these two groups of surveyed LAU is relatively high: for significance levels from 90% to 70% margin errors range from 14.13% to 8.90% for urban LAU and from 14.78% to 9.31% for urban-rural LAU. This means that the results for the last two LAU types should be approached with more caution than the results for the total population of LAU and rural LAU.

**Figure 1:** Research logic

## 3.2 Research results

### 3.2.1 The COVID-19 consequences for incomes of urban, rural and rural-urban lower LAU

In Table 2 we have presented the survey results showing which LAU income sources are most sensitive to the effects of COVID-19. These data allow for testing hypotheses 1 and 5 regarding the COVID-19 effects on revenue of local administration units and possible differentiation of these effects across types of LAU. Table 2 shows the results for the entire research sample, as well as separately for urban, urban-rural and rural LAU. The results for the entire LAU population indicate that the largest expected drops in income have taken place for sources such as: personal income tax, income from local taxes and corporate income tax. A comparison of these results with results for urban, urban-rural and rural LAU shows that respondents representing urban and rural-urban LAU slightly more often than those in general population and visibly more often than those representing rural LAU, indicated that their income will be reduced because of the pandemic. Differences were also noted for different sources of income. In urban LAU, respondents most often pointed to the reduction of income from personal income tax, income from local taxes, service and trade fee or corporate income tax. Property income and other income taxes were supposed to be relatively resistant to the effects of COVID-19. The responses given by respondents representing urban-rural LAU were very similar to those representing urban LAU. However, in the case of respondents from urban-rural LAU, property income and other income taxes were

not supposed to be as resistant to the effects of COVID-19 as suggested by respondents representing urban LAU. The results of the survey for rural LAU clearly differed from the groups described above. In almost all categories of revenue sources, indications of their decline were less frequent, and it was more often pointed out that income would remain unchanged. However, when it comes to the most frequently indicated sources of income, which are sensitive to the effects of the pandemic, the results were identical with the ones given above. In rural LAU, respondents expected a decline in income from personal income tax, corporate income tax and income from local taxes.

Data presented in Table 3 allows to assess the expected reduction in LAU income following COVID-19 and allow testing hypotheses 1 and 5 - similar to the data presented in the previous table. The results for the entire LAU population, as in the case of the previously discussed reductions in income from various sources, were again somewhere between those for rural and urban/urban-rural LAU. While respondents from rural LAU indicated slightly lower sensitivity of various sources of income to the impact of COVID-19 than the entire LAU population, and visibly lower in comparison to urban and urban-rural LAU, when asked to assess the expected scale of COVID-19 induced LAU income reduction, they believed that it would be greater for them than for urban and urban-rural LAU.

### **3.2.2 COVID-19 consequences for expenses and debt of urban, rural and rural-urban lower LAU**

The survey results concerning the expected direction of changes of various types of LAU expenditure are presented in Table 4. Data presented in this table allows testing hypotheses relating to the impact of COVID-19 on LAU expenditure (H2), LAU debt (H3) and financing of projects included in their current strategies (H4). Any differences between LAU types in the answers to the questions will be useful in testing hypothesis 5 about the differences between LAU types. Again, in most cases the score for overall population was between rural LAU and urban and urban-rural LAU. The analysis of these results shows that decline in expenditure on materials and services is expected in all LAU types - rural, urban, and urban-rural. It is also worth noting that while in the case of amounts spent on materials and services most respondents expected their reduction, a relatively large percentage of respondents, compared to other types of expenditure, suggested their increase. That may be indicative of changes in the structure of these expenses and reductions in some of their categories and increases in others. Investment expenditure scored next on the list of indications suggesting a reduction. The third place in this ranking was taken by cuts in grants and subsidies. Many types of expenditure remain relatively immune to the effects of COVID-19. This applies to remuneration-related expenses. Most responses concerning debt servicing expenditures suggested that they would remain stable in all types of LAU. The same was believed about benefits for

individuals, however, the percentage of responses indicating that these expenses would decrease was also quite high.

Data presented in Table 5 show the impact of the consequences of COVID-19 on various types of LAU expenses (H2) and debt (H3). It should be noted that in the case of questions about the effect of COVID-19 consequences for new or current investments, as well as their impact on debt, a very large percentage of respondents were not able to give a clear-cut answer to the question. When asked to react to the statement that "as a result of the COVID-19 pandemic, our LAU will no more be able to finance new investments", 36.2% of the total population of respondents had no opinion (4). The sum of the response percentages for answers ranging from 'rather agree' to 'strongly agree' (5, 6, 7) outweighed the sum of the percentages of answers 'rather disagree' to 'strongly disagree' (1, 2, 3). The response percentage of the former was by 23.8 percentage points higher than the latter for the entire population. For respondents from rural LAU the difference was only 17.4 pp. On the other hand, for representatives of urban LAU and urban-rural LAU, it was respectively 33.3 pp. and 45 p.p.

When it comes to the next statement according to which "as a result of the COVID-19 pandemic, our LAU intends to reduce investment and investment purchases", 29.2% of all respondents had no opinion. The sum of response percentages for answers from 'rather agree' to 'strongly agree' outweighed the sum of the percentages of answers from 'rather disagree' to 'strongly disagree' by 18.5 pp. In the case of respondents from rural LAU, the difference was only 10.4 pp. Similarly, for respondents from urban LAU it was only 11.1 pp. On the other hand, in the case of respondents from urban-rural LAU, it reached as much as 60 pp.

More decisive opinions were presented by the respondents in response to the statement suggesting that "as a result of the effects of the COVID-19 pandemic, our LAU intends to reduce current expenses". Only 15.6% of all respondents selected 'no opinion' answer. The sum of the percentage of answers ranging from 'rather agree' to 'strongly agree' outweighed the sum of the percentage of answers from 'rather disagree' to 'strongly disagree' by 50 pp. For respondents from rural LAU, the difference was smaller and amounted to 37.4 pp. In the case of respondents from urban LAU, it reached 77.8 pp. While in the case of respondents from urban-rural LAU, it reached 84.2 pp.

Completely different from the above were respondents' opinions regarding the statement that "Following the effects of the COVID-19 pandemic, our LAU intends to increase the debt". Admittedly, 'no opinion' response prevailed; it was declared by 40.3% of all respondents. However, the sum of response percentages for answers from 'rather agree' to 'strongly agree' was by 19.4 pp lower than the sum of the percentage of answers from 'rather disagree' to 'strongly disagree'. For respondents

from rural LAU, this difference was even bigger and reached 37.4 pp. On the other hand, for respondents from urban LAU, it amounted to 11.1 pp. Interestingly, among respondents from urban-rural LAU the answers were more evenly distributed, and the difference was 0 pp.

### **3.2.3 COVID-19 consequences for development strategies of urban, rural and rural-urban lower LAU**

To assess the changes in the development strategies of urban, rural and rural-urban LAU as part of the survey we included questions about anticipated difficulties in the implementation of projects financed by the Regional Development Plan (RDP) due to the COVID-19 pandemic and the need to update LAU development strategy because of the pandemic. We also asked the respondents to identify three main types of changes in the strategy of their LAU that should be introduced because of the effects of the pandemic.

Table 6 presents answers to the question concerning anticipated difficulties in the implementation of projects financed by the RDP due to the pandemic and relating to hypotheses concerning the impact of COVID-19 on the feasibility of the strategy (H4, H5) and the differences between LAU types (H6). Noteworthy is the high percentage of 'hard to say' responses by respondents from all LAU types, which indicates a high level of uncertainty regarding the effects of COVID-19 on LAU and the implementation of projects under the RDP. A fairly large proportion of respondents in all LAU types, however, indicated that investments made under the RDP would not be hindered by the consequences of COVID-19. Noteworthy, quite large differences between the LAU types were observed for the answer 'it will delay the investment.' The answer 'it will limit the scope of the investment' was chosen by relatively small group of respondents. The hereto presented outcomes reflect, on the one hand, the already mentioned high uncertainty as to the impact of COVID-19 on the execution of the RDP. On the other hand, LAU remain divided over the direction of COVID-19 impact on the implementation of RDP investment projects. Their answers represent a wide spectrum starting from the suggestion that the pandemic has no influence on these projects through concerns about possible delays in their implementation up to expected need to limit their scope.

High uncertainty as to the effects of COVID-19 on the implementation of the LAU strategy was also confirmed by the results obtained in response to the question "Should the strategy of your LAU be updated due to the ongoing Pandemic" presented in Table 7.

Interesting results were collected from answers to the only one open question in the study: "Please indicate three main types of changes in the strategy of your LAU that should be introduced as a result of the effects of the Pandemic". Their analysis

shows that respondents from urban and urban-rural LAU gave similar responses and focused on activities related to the development of e-administration and public e-services, as well as the strengthening of the health service, health prevention and pandemic countermeasures in general. In replies provided by representatives of rural LAU the above issues - apart from the development of e-administration - were practically absent. In turn, their responses contained proposals concerning labor market related economic policy measures, the need to promote greater economic diversification, new investment projects, and LAU financial management, which were absent from answers given by urban and urban-rural LAU. That may be attributed to the fact that rural LAU are less densely populated and the effects of social distancing or counteracting the pandemic were not so important for them as efforts to immunize local economies against shocks caused by crises, such as those caused by the effects of COVID-19.

In order to check the differences in the effects of Covid-19 for different LAU types, an ANOVA test of variance was performed. The null hypothesis ( $H_0$ ) of ANOVA was that there is no difference among group means, i.e. urban, rural and urban-rural LAU. The alternate hypothesis ( $H_a$ ) is that at least one group differs significantly from the overall mean of the dependent variable. As shown in Table 8 and 9, we found a statistically-significant difference in COVID-19 impact only in three cases. Firstly, in case of the impact on income from other income tax according to type of LAU ( $p = 0,041 < 0,05$ ). A Tukey post-hoc test revealed significant pairwise differences between urban and rural LAU. Secondly, in case of the impact on investment projects and investment purchases ( $p = 0,031 < 0,05$ ). A Tukey post-hoc test revealed significant pairwise differences between urban and urban-rural LAU. Thirdly, concerning the impact (reduction) on current expenses ( $p = 0,016, < 0,05$ ). A Tukey post-hoc test revealed significant pairwise differences between urban-rural and rural LAU.

#### **4 Discussion**

In the above presented research logic we indicated the path dependence starting with the consequences of the Pandemic, through fiscal revenues, expenses and debt of LAU to financing development projects and changes to local development strategies. Moreover, we intended to identify the differences in these mechanisms between urban and rural areas. The above path dependence was reflected in five research hypotheses that we tested during the empirical part of the research.

In hypothesis 1 we expected that COVID-19 would impact sources of local governments revenues in LAU of the Mazovia region leading to diminished income of rural, urban-rural and urban LAU. Our analysis proved that all types of LAU expect their incomes to be reduced as a result of the pandemic. However, there are differences in the scope of the expected changes depending on the source of

revenue. These findings confirm the results presented by Kochanov et al. (2020) showing that the central government does not buffer the consequences of the Pandemic related to tax revenue losses. Our research also confirms that the most commonly indicated sources of revenue vulnerable to the effects of the pandemic included: income taxes, local taxes and service and trade fees. Among more resilient sources of revenue there were property income, other income taxes and other own revenue. Our study also revealed differences across the types of LAU. The ANOVA tests confirmed that COVID-19 had different effects on LAU in the case of other tax revenues (significant differences in pairs between urban and rural LAUs). Urban and urban-rural LAU more often than rural LAU expected reductions in their incomes. As a result, most LAU expected that their fiscal revenues would decrease due to the pandemic. Reduced income is the effect of expected lower revenues from the personal income tax, which is a consequence of the lockdown when many workers lost their jobs or their working time was reduced. Moreover, LAU expect lower revenue from the property tax due to reduced tax rates or allowances granted to businesses that were closed, which are located in cities rather than in rural areas.

The hypothesis 2 stated that the decline in revenues, on the one hand, and the effects of the COVID-19, on the other hand, would result in adjustments made to the expenditure of LAU and reduction of long-term investment expenditure. Some authors claim that adjustments made to the expenditure at the local level are challenging as there is not much room for cutting spending on the public tasks assigned to local governments (Belz & Sheiner, 2020). Other authors, like Auerbach et al. (2020) point out that all sides of the equation adjust with time, e.g. decline in revenues causes reduction of public services, which affects both expenditures and fees collected for some of the services. For example in the USA, the decline in health expenditures meant that health care facility revenues plunged. As a consequence, public hospitals reduced employment and cut back on supplies. On the other hand, running a hospital involves significant fixed costs. Our study also confirmed that expenditure adjusts to the changes in revenues. Moreover the ANOVA tests revealed that there are significant differences in investment projects and investment purchases between urban and urban-rural LAU. The same concerns current expenditure (in this case the ANOVA tests revealed differences in pairs between urban-rural and rural LAUs).

Our results demonstrated that all types of expenditure were more often expected to be reduced rather than increased as a result of the pandemic. However, some types of expenditure were expected to remain unchanged. The most vulnerable were expenses on materials and services, investment and subsidies. The most resilient, in turn, were expenses related to debt servicing, remuneration and benefits for individuals.

Restrictions introduced during the pandemic affected businesses in many sectors and led to the dismissal of employees or the reduction of working time, which translated into smaller income of individuals and, consequently, lower revenue from personal income tax. As a consequence, local governments plan to reduce investment striving to maintain current expenses at the same level. The adjustment of expenditure is necessary as planned expenses cannot exceed planned revenues. Income from property may be reduced, for example, due to lower rents for businesses. Based on these observations and analysis of the collected data, hypotheses 1 and 2 can be confirmed.

In hypothesis 3 we predicted that the net effect of changes in income and expenditure would increase LAU debt. An intuitive assumption was that a borrowing would mitigate the short-term budgetary shortfall (Deloitte, 2020a). Municipal bonds are reasonably priced, as they usually have a state guarantee (Sánchez & Wilkinson, 2020). Our analysis did not confirm the willingness to increase the debt, so this hypothesis was not confirmed. High uncertainty concerning the economic situation and revenue growth outlook do not provide a convenient environment for increasing debt. The above-mentioned uncertainty is clearly manifested in the share of 'hard to say' responses wherever such an answer was available. It can be assumed that LAU whose financial performance is less impressive cannot increase debt due to the aforementioned provisions. Also, LAU whose income is higher, but run large investment projects, have limited possibilities to provide a short-term response by incurring additional debt. That is why LAU declare their willingness to limit current expenditures, even though they are considered "fixed". The results are in contrast with reactions described in the literature in the past. As shown by experience, investment expenditure is the first to be cut in reaction to a financial crisis (Kim & Warner, 2021; Wolman, 1983). The study presented by Green and Loualiche (2021) explains why in the USA a similar results can be observed. The reason lies in the legal provisions requiring to balance each budget cycle. Increasing borrowings to smooth revenue and expenditure shocks is a subject to many restrictions. Therefore local governments are more likely to reduce service provision than borrow against future tax revenues. Moreover, Auerbach et al. (2020) argue that governments prefer to avoid the costs of servicing debt during times of economic stress.

Our research results are consistent with the results of research studies presented earlier in the text. The survey conducted by the OECD and the European Committee of the Regions (2020) indicates that in the short and medium terms the majority of governments at subnational level expect a financial shortfall as a result of the pandemic. The expected "scissors effect" of rising expenditure and falling revenues applies to all the types of subnational governments independently of their financial standing before the pandemic. Beyond the European Union, other surveys report the same negative effects of COVID-19 on subnational budgets (Yadavalli et al., 2020).

The hypothesis 4 concerned LAU development strategies. It states that LAU might encounter difficulties in financing projects included in their current strategies and suggests that this may lead to adjustments in these strategies. The conducted analysis did not provide grounds for a positive verification of hypothesis 4, referring to difficulties in financing activities included in their development strategies. Moreover, most LAU indicated uncertainty about their future development strategies rather than the willingness to modify them. This may be an effect of the fact that LAU are currently examining possibilities to implement development investment projects and are engaged in a stock-taking exercise to identify new needs of companies and residents. A similar situation was observed in other countries (Maher et al., 2020) exacerbated by the inconvenient in this situation transition from the 2014-2020 to the next budgeting period 2021-2027. The reason why the governments are not planning to adjust their strategies may be related to the fact that they consider some other responses to the financial stress like outsourcing or service closure (Sandford & Muldon-Smith, 2020).

Hypothesis 5 concerned differences in the structure of economies and budget of rural, urban-rural, and urban LAU. We expected that the effects of COVID-19 may vary depending on the type of LAU. This hypothesis was confirmed. Our study provided evidence that the COVID-19 pandemic had a different impact on different LAU types: (a) in case of other tax revenues there is a significant difference in pairs between urban and rural LAUs, (b) in case of investment projects and investment purchases there is significant difference in pairs between urban and urban-rural LAUs, (c) in case of current expenditure there is difference in pairs between urban-rural and rural LAUs. Apart from differences presented above, our analysis provides evidence that the characteristics of urban and rural LAU have consequences not only for their resilience against the pandemic but influence their strategies and actions undertaken in response to the crisis. Interestingly, when answering the open question about changes that should be introduced as a result of the effects of the pandemic, urban and urban-rural LAU indicated the necessity to address issues related to the development of e-administration and public e-services, as well as the strengthening of health service, health prevention and pandemic countermeasures in general. In the responses of rural LAU the above issues were practically absent, while aspects relating to the labor market policy, the need to promote greater economic diversification, undertaking new investments, and LAU financial management were present. This may be explained by lower population density in rural LAU where effects of social distancing or counteracting the pandemic were not as important as efforts made to immunize local economies against shocks caused by the COVID-19. This is a reasonable strategy, as cities are more resilient to the economic crisis despite higher exposure to risks related to the pandemic (Emergency Governance Initiative (2021)). It is interesting that none of the

respondents pointed to the need to implement any innovative measures affecting either the income or the expenditure.

## 5 Conclusions

The analysis shows that rural LAU are slightly more resilient to the economic crisis caused by the Pandemic than urban municipalities. This is due to the fact that in LAU urban budgets a greater role is played by personal income tax revenues from activities that were subject to lockdown restrictions. At the same time, in rural LAU the role of other taxes is greater and farmers' income is not subject to personal income tax. Moreover, rural LAU economies, due to their structure, were less affected by the effects of lockdown restrictions. For this reason, taxes from agricultural activity have remained stable. Property income is another important source of income. Urban LAU are also more vulnerable to the economic crisis because they have relatively higher revenues from property tax (higher tax rates in city centers) or from the rental of premises to enterprises. Despite the differences in the characteristics of urban, urban-rural and rural LAU the "scissors effect" of rising expenditure and falling revenues applies to all the types LAU.

Taking into account the expected limitations in investment expenditure, it can be anticipated that mainly those investments that are financed from EU funds will be implemented. Investments financed from domestic funds will be limited. This may cause a crowding out effect driving down spending from domestic funds and rising spending from the EU funds. The LAU that will find themselves in the extreme end of the "scissors effect" described above (i.e. will experience a large decrease in income and a relatively large increase in expenditure) will not be able to provide funds to co-finance investments. This situation has serious economic implications that could be a subject of a future research.

Mazovia is a region well reflecting the features of many Central and Eastern European (CEE) regions, resulting from the transition to market economy and EU accession. The common feature of many regions in CEE is a spatial differentiation between a strongly urbanised capital area and the surroundings with predominantly agricultural functions. The settlement network is of a polycentric character and the surrounding sub-regional centres. The sub-regional cities concentrate supra-local labour markets and public services of local government administration and higher education. The last group in the system of cities consists of centres which are the seats of urban or urban-rural communes, performing mainly functions of local importance. As many other regions in the CEE, Mazovia has an incomplete transport links, which do not serve the spatial integration of the region. Therefore this region may serve as a good example of LAU development strategies in other CEE regions and its experience may reflect local finance trends that will require public intervention. The research results are applicable to the regions that face similar

problems related to financing investment. Exacerbating of the “scissors effect” will have a negative impact on the economic development and catching-up process.

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### References:

- Auerbach, A. J., Gale, W. G., Lutz, B. & Sheiner, L. (2020) Effects of COVID-19 on Federal, State, and Local Government Budgets, *Brookings Papers on Economic Activity*, 2020(3), pp. 229-278.
- Ascani, A., Faggian, A., & Montresor, S. (2020) The geography of COVID-19 and the structure of local economies: The case of Italy, *Journal of Regional Science*, 61(6), pp. 1-35, <https://doi.org/10.1111/jors.12510>.
- Autor, D. H. (2019) Work of the Past, Work of the Future, *AEA Papers and Proceedings*, 109, pp. 1-32, <https://doi.org/10.1257/pandp.20191110>.
- Bailey, D., Clark, J., Colombelli, A., Corradini, C., De Propris, L., Derudder, B., Fratesi, U., Fritsch, M., Harrison, J., Hatfield, M., Kemeny, T., Kogler, D. F., Legendijk, A., Lawton, P., Ortega-Argilés, R., Otero, C. I. & Usai, S. (2020) Regions in a time of pandemic, *Regional Studies*, 54(9), pp. 1163-1174, <https://doi.org/10.1080/00343404.2020.1798611>.
- Belz, S. & Sheiner, L. (2020) *How will the coronavirus affect state and local government budgets?* *BROOKINGS Up Front*, (Brookings), available at: <https://www.brookings.edu/blog/up-front/2020/03/23/how-will-the-coronavirus-affect-state-and-local-government-budgets/> (July 12, 2021).
- Benton, J. E., Rissler, G. E. & Wagner, S. (2020) City and County Governments in the Time of COVID-19 and the Recession: The Long and Winding Road, *State and Local Government Review*, 52(1), pp. 28-52, <https://doi.org/10.1177/0160323X20975470>.
- Chernick, H., Copeland, D. & Reschovsky, A. (2020) The Fiscal Effects of the COVID-19 Pandemic on Cities: An Initial Assessment, *National Tax Journal*, 73(3), pp. 699-732, <https://doi.org/10.17310/ntj.2020.3.04>.
- Cipriani, M., Haughwout, A., Kovner, A., Spada, G. L., Lieber, M. & Nee, S. (2020) *Municipal Debt Markets and the COVID-19 Pandemic*, Federal Reserve Bank of New York Liberty Street Economics (June 29, 2020), (Federal Reserve Bank of New York), available at: <https://libertystreeteconomics.newyorkfed.org/2020/06/municipal-debt-markets-and-the-covid-19-pandemic.html> (July 1, 2021).
- Clemens, J. & Miran, S. (2012) Fiscal Policy Multipliers on Subnational Government Spending, *American Economic Journal: Economic Policy*, 4(2), pp. 46-68, <https://doi.org/10.1257/pol.4.2.46>.
- Clemens, J. & Veuger, S. (2020) Implications of the Covid-19 Pandemic for State Government Tax Revenues, *National Tax Journal*, 73(3), pp. 619-644, <https://doi.org/10.17310/ntj.2020.3.01>.
- Conte, A., Lecca, P., Sakkas, S. & Salotti, S. (2020) The territorial economic impact of Covid-19 in the EU. A Rhomolo analysis, *Territorial Development – JRC Policy Insights*,

- July 2020 (European Commission), pp. 1-4, available at: <https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/territorial-economic-impact-covid-19-eu-rhomolo-analysis> (June 18, 2021).
- Cortright, J. (2020) *Cities and coronavirus: Some thoughts*. *CityCommentary*, available at: <https://cityobservatory.org/cities-and-coronavirus-some-thoughts-2/> (June 1, 2021).
- Deloitte (2020a) *Surviving the pandemic budget shortfalls. A playbook for state and local governments* (Deloitte), available at: <https://www2.deloitte.com/us/en/insights/economy/covid-19/state-budget-shortfalls.html> (May 15, 2021).
- Deloitte (2020b) *COVID-19—How municipalities can respond, recover, and thrive in the pandemic era, Phase 1: Respond* (Deloitte), available at: <https://www2.deloitte.com/content/dam/Deloitte/ca/Documents/public-sector/ca-covid19-how-municipales-respond-aoda-en.pdf> (May 14, 2021).
- Delventhal, M., Kwon, E. & Parkhomenko, A. (2022) JUE Insight: How Do Cities Change When We Work from Home?, *Journal of Urban Economics*, 127, <https://doi.org/10.1016/j.jue.2021.103331>.
- Dodds, K., Broto, V. C., Detterbeck, K., Jones, M., Mamadouh, V., Ramutsindela, M., Varsanyi, M., Wachsmuth, D. & Woon, C. Y. (2020) The COVID-19 pandemic: Territorial, political and governance dimensions of the crisis, *Territory, Politics, Governance*, 8(3), pp. 289-298, <https://doi.org/10.1080/21622671.2020.1771022>.
- Douglas, J. W. & Raudla, R. (2020) What Is the Remedy for State and Local Fiscal Squeeze During the COVID-19 Recession? More Debt, and That Is Okay, *The American Review of Public Administration*, 50(6–7), pp. 584-589, <https://doi.org/10.1177/0275074020941717>.
- Economic Observatory (2020) *Why has coronavirus affected cities more than rural areas?* (Nations, Regions & Cities), available at: <https://www.economicsobservatory.com/why-has-coronavirus-affected-cities-more-rural-areas> (May 12, 2021).
- Emergency Governance Initiative (2020) *The COVID-19 Response: Governance Challenges and Innovations by Cities and Regions*, *Emergency Governance Initiative Analytics Note #2, Policy Briefs and Analytics Notes* (LSE Cities), pp. 1–10, available at: <https://www.lse.ac.uk/Cities/Assets/Documents/EGI-Publications/AN02-EN.pdf> (February 18, 2022).
- Emergency Governance Initiative (2021) *The Impact of the COVID-19 Pandemic on Subnational Finances*, *Emergency Governance Initiative Analytics Note #3*, Policy Briefs and Analytics Notes (LSE Cities), pp. 1–4, available at: <https://www.lse.ac.uk/Cities/publications/Policy-Briefs-and-Analytics-Notes/Analytics-Note-02-The-COVID-19-Response-Governance-Challenges-and-Innovations-by-Cities-and-Regions> (June 1, 2021).
- European Committee of Regions (2020) *EU annual regional and local barometer. Full report* (Brussels: European Committee of Regions).
- Ezcurra, R. (2020) The economic development of Europe's regions: A quantitative history since 1900, *Regional Studies*, 54(3), pp. 440-441, <https://doi.org/10.1080/00343404.2019.1690782>.
- Green, D. & Loualiche, E. (2021) State and local government employment in the COVID-19 crisis, *Journal of Public Economics*, 193, <https://doi.org/10.1016/j.jpube.2020.104321>.
- ICAEW (2020) *Coronavirus Economic Outlook: Differences between regions*, (May 22, 2020) (Institute of Chartered Accountants in England and Wales), available at: <https://www.icaew.com/technical/economy/economic-insight/coronavirus-uk-economic-outlook-differences-across-regions?fromSearch=1> (April 17, 2021).

- Kemeny, T. & Storper, M. (2020) The fall and rise of interregional inequality: Explaining shifts from convergence to divergence, *Scienze Regionali*, 19(2), pp. 175-198, <https://doi.org/10.14650/97084>.
- Kim, Y. & Warner, M.E. (2021) Pragmatic municipalism or austerity urbanism? Understanding local government responses to fiscal stress, *Local Government Studies*, 47(2), pp. 234-252, <https://doi.org/10.1080/03003930.2020.1729751>.
- Kochanov, P., Hong, Y. & Mutambatsere, E. (2020) *COVID-19's Impact on Sub-National Governments* (Washington: International Finance Corporations World Bank Group), available at: [https://www.ifc.org/wps/wcm/connect/industry\\_ext\\_content/ifc\\_external\\_corporate\\_site/infrastructure/resources/covid-19+impact+on+sub-national+governments](https://www.ifc.org/wps/wcm/connect/industry_ext_content/ifc_external_corporate_site/infrastructure/resources/covid-19+impact+on+sub-national+governments) (May 12, 2021).
- Maher, C. S., Hoang, T. & Hindery, A. (2020) Fiscal Responses to COVID -19: Evidence from Local Governments and Nonprofits, *Public Administration Review*, 80(4), pp. 644–650, <https://doi.org/10.1111/puar.13238>.
- Mooney, H. & Zegarra, M. A. (2020) *Extreme Outlier: The Pandemic's Unprecedented Shock to Tourism in Latin America and the Caribbean*, Policy Brief No. IDB-PB-339 (Inter-American Development Bank), <http://dx.doi.org/10.18235/0002470>.
- Muro, M., Whiton, J. & Maxim, R. (2020) *COVID-19 is hitting the nation's largest metros the hardest, making a "restart" of the economy more difficult* (Washington: Brookings Institution), available at: <https://www.brookings.edu/blog/the-avenue/2020/04/01/why-it-will-be-difficult-to-restart-the-economy-after-covid-19/> (June 11, 2021).
- Nemec, J. & Špaček, D. (2020) The Covid-19 pandemic and local government finance: Czechia and Slovakia, *Journal of Public Budgeting, Accounting & Financial Management*, 32(5), pp. 837–846, <https://doi.org/10.1108/JPBAFM-07-2020-0109>.
- Nocco, A. (2005) The rise and fall of regional inequalities with technological differences and knowledge spillovers, *Regional Science and Urban Economics*, 35(5), pp. 542-569, <https://doi.org/10.1016/j.regsciurbeco.2004.08.001>.
- OECD (2020a) *The territorial impact of COVID-19: Managing the crisis across levels of government, OECD Policy Responses to Coronavirus*, (June 16, 2020) (OECD), available at: <https://www.oecd.org/coronavirus/policy-responses/the-territorial-impact-of-covid-19-managing-the-crisis-across-levels-of-government-d3e314e1/> (June 5, 2021).
- OECD (2020b) *COVID-19 and fiscal relations across levels of government, OECD Policy Responses to Coronavirus (COVID-19)*, (July 31, 2020) (OECD), available at: <https://www.oecd.org/coronavirus/policy-responses/covid-19-and-fiscal-relations-across-levels-of-government-ab438b9f/> (June 11, 2021).
- OECD (2020c) *Policy Implications of Coronavirus Crisis for Rural Development, OECD Policy Responses to Coronavirus (COVID-19)*, (June 16, 2020) (OECD), available at: <https://www.oecd.org/coronavirus/policy-responses/covid-19-and-fiscal-relations-across-levels-of-government-ab438b9f/> (June 1, 2021).
- OECD (2020d) *Cities Policy Responses, OECD Policy Responses to Coronavirus* (OECD), available at: <http://www.oecd.org/coronavirus/policy-responses/cities-policy-responses-fd1053ff/> (June 6, 2021).
- Phillipson, J., Bennett, K., Lowe, P. & Raley, M. (2004) Adaptive responses and asset strategies: The experience of rural micro-firms and Foot and Mouth Disease, *Journal of Rural Studies*, 20(2), pp. 227–243, <https://doi.org/10.1016/j.jrurstud.2003.08.006>.
- Phillipson, J., Gorton, M., Turner, R., Shucksmith, M., Aitken-McDermott, K., Areal, F., Cowie, P., Hubbard, C., Maioli, S., McAreavey, R., Souza-Monteiro, D., Newbery, R.,

- Panzone, L., Rowe, F. & Shortall, S. (2020) The COVID-19 Pandemic and Its Implications for Rural Economies, *Sustainability*, 12(10), pp. 1-9, <https://doi.org/10.3390/su12103973>.
- Rada Ministrów (2020) *Sprawozdanie z wykonania budżetu państwa za okres od 1 stycznia do 31 grudnia 2019 r. Informacja o wykonaniu budżetów jednostek samorządu terytorialnego* (Ministerstwo Finansów RP), available at: <https://www.gov.pl/web/finanse/sprawozdanie-roczne-za-2019-rok> (April 21, 2021).
- Rosés, J. R. & Wolf, N. (2018) *The Economic Development of Europe's Regions. A Quantitative History since 1900* (Abingdon, New York: Routledge), <https://doi.org/10.4324/9780429449789>.
- Sánchez, J. & Wilkinson, O. (2020) *How COVID-19 Has Affected the Municipal Bond Market* (Federal Reserve Bank of St. Louis), available at: <https://www.stlouisfed.org/publications/regional-economist/fourth-quarter-2020/how-covid-affected-municipal-bond-market?print=true> (April 20, 2021).
- Sandford, M. & Muldon-Smith, K. (2020) *Covid-19 has emphasised the importance of the local state—But how to solve a problem like local government funding?* (LSE Blog), available at: <https://blogs.lse.ac.uk/politicsandpolicy/local-government-funding/> (June 1, 2021).
- Shon, J. & Kwak, S. (2020) Managing Fiscal Volatility: An Empirical Analysis of California County Governments' Saving Behavior, *American Review of Public Administration*, 50(3), pp. 328-345.
- Wolman, H. (1983) Understanding Local Government Responses to Fiscal Pressure: A Cross National Analysis, *Journal of Public Policy*, 3(3), pp. 245–263, <https://doi.org/10.1017/S0143814X00005936>.
- World Bank (2020) *COVID-19: Safeguarding Lives and Livelihoods – A Checklist Guide for Local Governments* (World Bank Group: Urban, Disasters Risk Management, Resilience & Land).
- Yadavalli, A., McFarland, C. K. & Wagner, S. (2020) *What Covid-19 means for city finances* (National League of Cities), available at: [https://covid19.nlc.org/wp-content/uploads/2020/06/What-Covid-19-Means-For-City-Finances\\_Report-Final.pdf](https://covid19.nlc.org/wp-content/uploads/2020/06/What-Covid-19-Means-For-City-Finances_Report-Final.pdf) (June 15, 2021).

**Appendix:****Table 1:** Response rates and margin error in survey research by type of LAU in Mazovia region

	Urban LAU	Rural-urban LAU	Rural LAU	Total
General population	37	54	225	316
Structure of population (all LAU=100%)	11.7%	17.1%	71.2%	100%
Number of surveyed entities	18	20	92	133
Structure of surveyed entities (surveyed LAU=100%)	13.5%	15.0%	71.4%	100%
Response rate	48.6%	37.0%	42.2%	42.1%
Margin error (c.l. 90%)	14.13%	14.78%	6.63%	5.45%
Margin error (c.l. 80%)	10.96%	11.46%	5.14%	4.23%
Margin error (c.l. 70%)	8.90%	9.31%	4.18%	3.44%

**Table 2:** Survey results: Question “Please indicate how your LAU own income will change as a result of the COVID-19 pandemic”, Single choice answers, %

Type of LAU	Answers	Income from local taxes	Service and trade fee	Property income	Personal income tax	Corporate income tax	Other income taxes	Other own income
All LAU	Decrease	72.2	50.8	34.1	79.7	70.7	49.6	47.7
	Remain the same	14.3	35.6	47	5.3	18	25.6	24.6
	Hard to say	13.5	13.6	18.9	15	10.5	24.8	27.7
Urban	Decrease	83.3	77.8	38.9	88.9	70.6	50.0	61.1
	Remain the same	5.6	16.7	55.6	5.6	23.5	44.4	22.2
	Hard to say	11.1	5.6	5.6	5.6	5.9	5.6	16.7
Urban-rural	Decrease	85.0	80.0	55.0	80.0	70.0	70.0	60.0
	Remain the same	0.0	10.0	30.0	0.0	10.0	10.0	15.0
	Hard to say	15.0	10.0	15.0	20.0	20.0	20.0	25.0
Rural	Decrease	66.3	38.5	27.5	77.2	70.7	44.6	42.7
	Remain the same	19.6	45.1	49.5	6.5	8.7	25.0	27.0
	Hard to say	14.1	16.5	23.1	16.3	20.7	30.4	30.3

**Table 3:** Survey results: Question “Please estimate by what percentage the own income of your commune / city will decrease as a result of the COVID-19 pandemic in the entire year 2020”, single choice answers, %

	All LAU	Urban	Urban-rural	Rural
up to 10%	16.5	33.3	5.0	15.2
11% - 20%	24.8	27.8	30.0	21.7
21% - 30%	28.6	16.7	30.0	31.5
31% - 40%	13.5	11.1	10.0	15.2
41% - 50%	0.8	0.0	0.0	1.1
51% - 60%	0.8	0.0	5.0	0.0
Hard to say	15.0	11.1	20.0	15.2

**Table 4:** Survey results: Question “Please indicate how your LAU expenses will change as a result of the COVID-19 pandemic”, single choice answers, %

Type of LAU	Answer	Investment	Remuneration	Materials and services	Grants and subsidies	Benefits for individuals	Debt servicing
All LAU	Increase	3.1	2.3	15.5	3.9	12.4	10.9
	Remain the same	35.7	68.2	20.2	38.8	49.6	68.2
	Fall	48.1	15.5	52.7	31.8	20.9	7.0
	Hard to say	13.2	14.0	11.6	25.6	17.1	14.0
Urban	Increase	0.0	0.0	20.0	5.9	5.9	11.8
	Remain the same	35.3	64.7	10.0	23.5	52.9	64.7
	Fall	64.7	29.4	60.0	47.1	29.4	5.9
	Hard to say	0.0	5.9	10.0	23.5	11.8	17.6
Urban-rural	Increase	0.0	0.0	15.0	0.0	5.0	5.0
	Remain the same	20.0	60.0	5.0	40.0	60.0	70.0
	Fall	60.0	25.0	70.0	35.0	20.0	5.0
	Hard to say	20.0	15.0	10.0	25.0	15.0	20.0
Rural	Increase	4.3	3.3	15.2	4.3	15.2	12.0
	Remain the same	39.1	70.7	25.0	41.3	46.7	68.5
	Fall	42.4	10.9	47.8	28.3	19.6	7.6
	Hard to say	14.1	15.2	12.0	26.1	18.5	12.0

**Table 5:** Survey results: Question “Please rate to what extent you agree with the following statements...” (Likert scale answers: 1 = strongly disagree, ..., 7 =strongly agree), % of n

	Strongly agree	Agree	Slightly agree	Neutral	Slightly disagree	Disagree	Strongly disagree
<b>As a result of the COVID-19 pandemic, our LAU will no more be able to finance new investment projects</b>							
Urban LAU (n=18)	11.1	5.6	11.1	11.1	27.8	11.1	22.2
Urban-rural LAU (n=21)	0.0	0.0	0.0	55.0	20.0	10.0	15.0
Rural LAU (n=92)	6.5	5.4	10.9	37.0	14.1	9.8	16.3
All LAU(n=130)	6.2	4.6	9.2	36.2	16.9	10.0	16.9
<b>As a result of the COVID-19 pandemic, our LAU intends to reduce investment projects and investment purchases</b>							
Urban LAU (n=18)	11.1	5.6	5.6	44.4	22.2	11.1	0.0
Urban-rural LAU (n=21)	0.0	0.0	5.0	30.0	30.0	5.0	30.0
Rural LAU (n=92)	8.7	8.7	14.1	26.1	18.5	4.3	19.6
All LAU(n=130)	7.7	6.9	11.5	29.2	20.8	5.4	18.5
<b>As a result of the effects of the COVID-19 pandemic, our LAU intends to reduce current expenses</b>							
Urban LAU (n=21)	0.0	0.0	5.6	11.1	27.8	16.7	38.9
Urban LAU (n=19)	0.0	0.0	0.0	15.8	21.1	21.1	42.1
Rural LAU (n=91)	4.4	5.5	13.2	16.5	19.8	14.3	26.4
All LAU (n=128)	3.1	3.9	10.2	15.6	21.1	15.6	30.5
<b>Following the effects of the COVID-19 pandemic, our LAU intends to increase the debt</b>							
Urban LAU (n=21)	0	0	5.6	11.1	27.8	16.7	38.9
Urban LAU (n=19)	0	0	0	15.8	21.1	21.1	42.1
Rural LAU (n=91)	4.4	5.5	13.2	16.5	19.8	14.3	26.4
All LAU (n=128)	3.1	3.9	10.2	15.6	21.1	15.6	30.5

**Table 6:** Survey results: Question “Does your LAU have or anticipate difficulties in the implementation of projects financed by the Regional Development Plan due to the ongoing Pandemic?”, single choice answers, %

	All	Urban	Urban-rural	Rural
Yes, it will limit the scope of the investment	9.3	0.0	15.0	9.9
Yes, it will delay the implementation of the investment	16.3	33.3	10.0	14.3
Yes, it will replace the planned investments with new investments	3.1	0.0	5.0	3.3
No, it will not hinder the implementation of the investment	32.6	27.8	35.0	33.0
Hard to say	38.8	38.9	35.0	39.6

**Table 7:** Survey results: Question “Should the strategy of your LAU be updated due to the ongoing Pandemic?”, single choice answers, %

	All LAU	Urban	Urban-rural	Rural
Definitely yes	0.8	5.6	0.0	0.0
Yes	3.8	0.0	0.0	5.4
Probably yes	9.2	16.7	15.0	6.5
Hard to say	49.2	55.6	45.0	48.9
Probably not	26.9	22.2	20.0	29.3
No	10.0	0.0	20.0	9.8
Definitely not	0.0	0.0	0.0	0.0

**Table 8:** Results table from one-way analysis of variance

Question	Source of variation	Sum of Squares	df	Mean Square	F	Sig.
Please indicate how your LAU own income will change as a result of the COVID-19 pandemic: ...income from local taxes (Table 2)	Between Groups	368,948	2	184,474	0,167	0,846
	Within Groups	143578	130	1104,446		
	Total	143947	132			
...service and trade fee	Between Groups	2308,471	2	1154,235	1,047	0,354
	Within Groups	142219,2	129	1102,475		
	Total	144527,7	131			
...property income	Between Groups	5599,869	2	2799,934	1,969	0,144
	Within Groups	183451,2	129	1422,102		
	Total	189051,1	131			
...personal income tax	Between Groups	2638,701	2	1319,351	1,112	0,332
	Within Groups	154172,7	130	1185,944		
	Total	156811,4	132			
...corporate income tax	Between Groups	4167,694	2	2083,847	1,525	0,222
	Within Groups	177673,8	130	1366,722		
	Total	181841,5	132			
...other income tax	Between Groups	11005,43	2	5502,717	3,262	0,041
	Within Groups	219307,3	130	1686,979		
	Total	230312,7	132			
...other own income	Between Groups	2130,504	2	1065,252	0,565	0,57
	Within Groups	239494,6	127	1885,784		
	Total	241625,1	129			
Please estimate by what percentage the own income of your commune / city will decrease as a result of the COVID-19 pandemic in the entire year 2020 (Table 3)	Between Groups	1213,381	2	606,691	0,502	0,606
	Within Groups	157078,5	130	1208,296		
	Total	158291,9	132			
Please indicate how your LAU expenses will change as a result of the COVID-19 pandemic ...Investment (Table 4)	Between Groups	4163,411	2	2081,705	2,008	0,138
	Within Groups	133756,1	129	1036,869		
	Total	137919,5	131			
...Remuneration	Between Groups	395,965	2	197,983	0,168	0,846
	Within Groups	152161,8	129	1179,548		
	Total	152557,7	131			
...Materials and services	Between Groups	85,498	2	42,749	0,044	0,957
	Within Groups	124004	129	961,271		
	Total	124089,5	131			
...Grants and subsidies	Between Groups	532,635	2	266,317	0,149	0,862
	Within Groups	230534,2	129	1787,087		
	Total	231066,8	131			
...Benefits for individuals	Between Groups	288,69	2	144,345	0,105	0,901
	Within Groups	178048,3	129	1380,219		
	Total	178337	131			
...Debt servicing	Between Groups	1051,737	2	525,868	0,467	0,628
	Within Groups	145372,5	129	1126,919		
	Total	146424,3	131			

As a result of the COVID-19 pandemic, our LAU will no more be able to finance new investment projects (Table 5)	Between Groups	3,577	2	1,788	0,643	0,527
	Within Groups	361,521	130	2,781		
	Total	365,098	132			
As a result of the COVID-19 pandemic, our LAU intends to reduce investment projects and investment purchases (Table 5)	Between Groups	21,703	2	10,852	3,572	0,031
	Within Groups	394,974	130	3,038		
	Total	416,677	132			
As a result of the effects of the COVID-19 pandemic, our LAU intends to reduce current expenses (Table 5)	Between Groups	22,777	2	11,388	4,26	0,016
	Within Groups	342,185	128	2,673		
	Total	364,962	130			
Following the effects of the COVID-19 pandemic, our LAU intends to increase the debt (Table 5)	Between Groups	7,787	2	3,893	1,189	0,308
	Within Groups	422,297	129	3,274		
	Total	430,083	131			
Does your LAU have or anticipate difficulties in the implementation of projects financed by the Regional Development Plan due to the ongoing Pandemic (Table 6)	Between Groups	321,916	2	160,958	0,072	0,931
	Within Groups	287671,1	128	2247,43		
	Total	287993	130			
Should the strategy of your LAU be updated due to the ongoing Pandemic? (Table 7)	Between Groups	1,803	2	0,901	0,978	0,379
	Within Groups	119,761	130	0,921		
	Total	121,564	132			

**Table 9:** Multiple comparisons – Tukey HSD

			Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Please indicate how your LAU own income will change as a result of the COVID-19 pandemic: ...other income tax	U	U-R	-14,957	12,833	0,476	-45,38	15,47
		R	-24,825*	9,933	0,036	-48,37	-1,27
	U-R	U	14,957	12,833	0,476	-15,47	45,38
		R	-9,867	10,133	0,595	-33,89	14,16
	R	U	24,825*	9,933	0,036	1,27	48,37
		U-R	9,867	10,133	0,595	-14,16	33,89
As a result of the COVID-19 pandemic, our LAU intends to reduce investment projects and investment purchases	U	U-R	-2,01648*	0,78147	0,030	-3,8781	-0,1548
		R	-0,61312	0,61416	0,580	-2,0762	0,8500
	U-R	U	2,01648*	0,78147	0,030	0,1548	3,8781
		R	1,40336	0,59546	0,053	-0,0152	2,8219
	R	U	0,61312	0,61416	0,580	-0,8500	2,0762
		U-R	-1,40336	0,59546	0,053	-2,8219	0,0152
As a result of the effects of the COVID-19 pandemic, our LAU intends to reduce current expenses	U	U-R	-0,35526	0,57330	0,810	-1,7177	1,0072
		R	0,81579	0,43338	0,149	-0,2141	1,8457
	U-R	U	0,35526	0,57330	0,810	-1,0072	1,7177
		R	1,17105*	0,46474	0,035	0,0666	2,2755
	R	U	-0,81579	0,43338	0,149	-1,8457	0,2141
		U-R	-1,17105*	0,46474	0,035	-2,2755	-0,0666

Notes: U – urban lau; R – rural LAU, U-R – urban-rural LAU; \* The mean difference is significant at the 0.05 level.