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Economic Activity of Residents and Revenue Autonomy of Municipalities in the Context of the COVID-19 Pandemic

Abstract

Theoretical background: The impact of the COVID-19 pandemic has had far reaching effects on different strata of socio-economic life, including the financial well-being of residents and the financial situation of local government units. Generally, research papers either approach "local development" conceptually or quantify data regarding a certain locality: demographic structure, residents' education, condition of the labour market, residents' income and their technological literacy. This paper is an attempt to arrive at a larger picture and identify the interdependence between economic activity of residents and financial autonomy of the local government, and secondly, to pinpoint the impact the COVID-19 pandemic had on these categories.

Purpose of the article: The purpose of the paper is to identify residents' income sources and the dependence between them and the development potential of the municipality they live in. The paper examines residents' revenue, income and income tax advance payments. The survey covers all municipalities in Poland according to their formal administrative status: urban, rural, urban-rural and cities with *powiat* rights. The research covers the period of 2015–2020, as per data availability.

Research methods: The paper applied monograph methodology to review the literature on the subject, and comparative methodology to process quantitative data, which allowed the authors to calculate all deviations. Next, the economic phenomena were assessed, i.e. their nature (positive or negative) and frequency of occurrence were determined according to an assessment scale where the base is the starting point. The structure of the number of taxpayers, their revenues and incomes was compared by sources of income, in result of which hierarchy of income sources was created for each municipality. Following that, the main income sources were analysed and correlated with the municipality's own (tax) revenue. To enable comparability of diagnostic variables, the zero unitarisation method was applied.

Main findings: The findings reveal that the main sources of residents' income include salaries, pensions and disability pensions, non-agricultural economic activity, wages and contractual income. Revenue streams generated from residents' economic activity show a variance across municipalities. The results obtained confirm the dependence between residents' economic activity and own revenue sources of local government units. Based on the findings, it can be concluded that the relationship between taxpayers' income from particular sources and revenue autonomy of municipalities and cities with *powiat* rights varies by the type of municipality. Thus, the findings clearly demonstrate that residents' economic activity is an endogenous resource that definitely affects municipal development. For local authorities, understanding economic realities of residents may be a game changer and an insight that will help them create environments conducive to socioeconomic growth.

Introduction

The development of cities comes from using their full potential, including the economic activity of residents, which indirectly translates into own revenue of local government units (hereinafter referred to as "LGU"). For this reason, the starting point of our considerations will be the theoretical concepts about local entrepreneurship, as well as concepts of endogenous and exogenous development. An important element of endogenous potential for development is how goods and resources are being used within cities. This is related to socio-economic integration with the entirety of local economy, which is one of the prerequisites of socio-economic development. Local development potential was greatly affected by the onset of the COVID-19 pandemic in 2020,[1] the effects of which are felt both in terms of economic activity of residents and the financial situation of local governments. So far, in the literature on the subject, researchers have focused mainly on the theoretical approach to local development and its drivers, and on quantitative data including demographic structure, residents' education, the labour market, as well as residents' financial situation and technological literacy.

This paper adds to the research on endogenous factors of local development. For this purpose, data on residents' economic activity, and more specifically, their individual sources of income, will be used. This data will be juxtaposed with local

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[1] Infectious disease of the respiratory system caused by infection with the SARS-CoV-2 virus, which has been recognised as a pandemic by the World Health Organization since 2020.

budgets, and more specifically, with municipality's own revenue. The research procedure applied will enable the authors to determine the impact and correlation between residents' sources of income and the revenue autonomy of local governments. The purpose of the paper is to analyse local economic activities of residents in terms of their sources of income and to identify the impact of sources of income on revenue autonomy of Polish municipalities. The term "local development potential" is exceptionally broad, but in this paper it is the revenue autonomy of the surveyed entities that will be of particular interest as an important factor of development project financing.

Economic activity of residents as an internal driver of local development – literature review

The first theory worth paying attention to is the concept of "**economic base**". Werner Sombart, who perceived the city as an economic entity with a specific specialisation, is considered a pioneer of the economics of technological change and the economic base theory. He claims that unique functions of the city depend on its relationship with what lies outside its boundaries, that is the external environment (Dziewoński, 1967, p. 12). An important factor influencing the city's development is the socio-economic activity of external entities. At this point, it should be noted that endogenous activities play a significant role, as this theory relates to the economic structure of the city. This concept focuses, in particular, on the impact of the exogenous (export) sector on the city, i.e. faster development of the city's functions, which, in turn, affects its specialisation. As pointed out by Matczak and Szymańska (2000, pp. 97–98), the above affects the endogenous nature of urban functions. However, when it comes to the city's unique functions, exogenous factors have a greater influence.

According to the economic base theory, the source of impulses for local development is the exogenous sector, which triggers the multiplier effect. The consequence of external activities is increased city's specialisation, which usually translates into increased own revenue of the city. In addition, microeconomic effects such as, e.g. an increase in demand for local services and products directly related to city's functions may be an added value (Sokołowski, 2008, p. 246).

In the context of determinants of city's development, and in particular with reference to revenue autonomy, the suggestion made by Tiebout (1956, p. 97) is very significant. Tiebout noted that one of the factors influencing the level of demand for export of goods and services outside the urban area is the acquisition of income, which should then be allocated to financing the city's socio-economic development.

Another concept is **the theory of creative classes**, otherwise known as the creative capital theory, formulated by Richard Florida. The concept is based on the assumption that an important factor in the development of cities is the so-called "creative class" that attracts innovative industries and contributes to economic growth. It includes employees of innovative and creative industries and such professionals as IT specialists,

high-profile managers and lawyers. According to this theory, specialist professions attract advanced technologies and rapidly developing businesses (Pratt, 2008, p. 108).

As Jewtuchowicz (2016, p. 223) points out, towards the end of the 20th century, the importance of fully harnessing the internal potential for the development of cities increased. Decision-makers realized that the city's endogenous resources must be acknowledged as drivers of city development. One could observe a gradual increase in local autonomy, which manifested itself in autonomous decision making when it comes to the selection of projects and their financing. The authors believe that "revenue autonomy", expanded on further in the paper, is an essential factor considered by local authorities in their decisions on the financing and execution of municipal projects.

At this point, it is worth to briefly look at theories exploring the use of city's endogenous potentials as factors influencing local development. One of the concepts is an approach focused on the **effectiveness of public tasks and institutional aspects**. Additionally, it is worth noting the importance of supporting the development of entrepreneurship and innovation, which are undoubtedly one of the factors influencing the city's development. The results of research on the impact of economic policy and actions taken by public authorities on economic processes point to this conclusion. There are also visible effects of the lack of a systemic approach on the part of public administration in the area of cooperation with entrepreneurs. This may result in the disappearance of institutional potential, as well as cause that the infrastructure of innovative enterprises will not be used in accordance with the originally assumed mission and vision (Bąkowski & Mażewska, 2018). The 2021 version of the *Centres of Innovation and Entrepreneurship in Poland* report emphasises the role of cooperation between enterprises and local and regional government. As part of the study, it was assessed that the highest intensity of cooperation with the local government was rated at 3.85 (the highest), and with the regional government at the level of 3.77. In turn, the lowest score was awarded to cooperation with government agencies (1.5). The usefulness of cooperation with various groups of partners was assessed similarly, among which the highest rating was given to the regional government (4.20), while the usefulness of cooperation with the local government was rated at the level of 3.67. Similarly, the lowest score in this case was achieved by the usefulness of cooperation with government agencies, which was assessed at the level of 1.75. The authors of the aforementioned report emphasise that such a low rating in the field of cooperation with government agencies is a new phenomenon, because so far there has been real cooperation between innovation and entrepreneurship centres and government agencies (Mażewska et al., 2021). It is worth noting that in the context of supporting entrepreneurship by public administration, it is important to select the field of science, technology and economy in which a given region is successful or can play a leading role. For this reason, local authorities as a partner should strive to create appropriate conditions for specialisation, both through access to information about economic opportunities and threats, as well as sources of financing, or access to appropriate infrastructure (Nowakowska, 2018, p. 17).

Referring to endogenous factors of local development, it is worth noting that the emergence of innovative products results in an increase in consumer income. This, in turn, leads to the development of services provided, and in the long term, to satisfying the demand for these services by the commercial sector (Drobniak, 2016, p. 31).

Thus, the economic activity of the residents can be described as one of the key internal potentials of the city. In the literature on the subject, this area is analysed on the basis of the level and structure of employment, the number of businesses, as well as the turnout in general elections, the level of subsidies obtained, including from the local government budget (Łapczyński, 2005, pp. 79–80).

As part of the theories focused on the internal potentials of the city's development, it is worth mentioning the concept originated by Elinor Ostrom in terms of the **effectiveness of the use of common resources in the management process by local communities**. The city's resource system is defined as resources available to all in relation to both natural and man-made resources. Therefore, it is important to distinguish between resource producers and resource users. The role of the public institution, which should support the market and monitor the level of the city's internal resources, is key (Faller, 2009, pp. 4–7).

As noted by Ostrom (2000, p. 154), in order to avoid the negative effects of collective cooperation, it is necessary to increase the authority and involvement of public authorities in establishing rules supporting the evolution of social norms. The corollary of this should be a more effective solution to the problems of collective action.

The above is confirmed by the results of the study on the assessment of local economic activities as an element of the development of small and medium-sized cities. Thus, the economic structure of the city, as well as endogenous activities, play an important role in local development. In addition, the impact of economic policy implemented by local authorities on stimulating socio-economic processes in the city has been confirmed (Budzeń & Sobczyk, 2020, p. 7). The development of cities depends on the existing socio-economic ties. One of the reasons for socio-economic development and economic growth is the level of integration of the local environment in tourism, housing, as well as regional and local space (Heffner, 2016, p. 16).

The above theories, as well as the topic of the paper, are valid in particular in the light of the COVID-19 pandemic. For example, the Central Statistical Office in Poland (GUS, 2021, p. 13) points out that in the last few years preceding the COVID-19 pandemic, the situation on the labour market has improved. The working population increased, the unemployed population decreased, and the inactive population aged 15 and more decreased as well. By 2019, the economic activity rate had stabilised at the level of 56%. In turn, the emergence of COVID-19 and the measures introduced to protect the health and life of residents disrupted the current trends in the labour market. In addition, the introduced restrictions resulted in limiting, and in some cases even closing, business activity. This situation translated into other sectors of the economy. The negative changes caused by the pandemic were visible both in the economic activity of men and women, although they concerned women to a greater extent.

With regard to the activities of local enterprises as endogenous development potential, it is worth paying attention to their dependence on local economies. In OECD countries, small and medium-sized enterprises account for around 2/3 of employment, of which 15% are self-employed. For this reason, this group is particularly vulnerable to the negative effects of the coronavirus pandemic. Local development agencies or more broadly local authorities should play an important role in supporting small and medium-sized enterprises in their short and long-term crisis response. On this basis, it should be noted that in the medium and long term, actions taken by local authorities should respond to changes in the demand for employee skills, as well as employment opportunities after COVID-19 (OECD, 2020). Fulfilling the main goal of this article, in the following part we will focus on the theoretical aspects of the revenue autonomy of LGUs, after which the research results will be presented.

Theoretical aspects of revenue autonomy as a source of financing for local development

When considering the revenue autonomy of LGUs, it is justified to start with indicating the premises that determine financial autonomy of the examined entities. Firstly, the source of independence is legal capacity, and secondly, equipping the local community with property. Thus, local authorities can both possess property and are independently responsible for the damage caused and liabilities incurred (Jagoda, 2016, p. 69).

The independence of LGUs enables them to make decisions on matters important to the residents. For this reason, it is worth noting that having autonomy by local authorities allows for determining the directions of allocating financial resources to meet the needs of the local community (Isufaj, 2014, p. 461). In addition, the provisions of the European Charter of Local Self-Government indicate that LGUs are financially independent. Based on Art. 3.1, local authorities bear full responsibility for regulating a significant part of public affairs (Journal of Laws of 1994, no. 124, item 607, as amended). The independence of local self-government may have a systemic, economic and political dimension. This paper focuses on the systemic and economic dimensions, because the proposed research covers revenue autonomy.

Revenue autonomy is an element of the broadly defined financial independence, which, however, is strictly dependent on the level of income (and revenues), i.e. funds enabling the financing of planned budget expenditures (Wolman et al., 2008, pp. 377–378). Therefore, it is important to enable the authorities of LGUs to freely shape the structure and size of budget revenues, in particular their own revenues (Poniatowicz, 2015, p. 15). As noted by Miemiec (2018, p. 221), the amount of funds held is one of the determinants of revenue autonomy. It is related to, for example, the functioning of an adequate financial system that would enable the performance of statutory public tasks.

When referring to revenue autonomy, the systematics of income is an aspect that must not be ignored. At this point, many different classifications can be mentioned,

but the authors decided to mention a selected few. First of all, it should be noted that Polish law lists the following sources of income (Art. 167, Journal of Laws of 1997, no. 78, item 483, as amended and Art. 3.1, Journal of Laws of 2021, item 1672, as amended):

– own income,
– general subsidy,
– special-purpose subsidies from the state budget.

An important issue is the definition of own income, and more specifically its sources, which result from the Income Act, Journal of Laws of 2021, item 1672, as amended (hereinafter referred to as the "Income Act"). It is important because own income means proceeds, which can be freely allocated by local authorities (Oulasvirta & Turała, 2005, p. 6). In turn, the Income Act of LGUs also lists subsidies from other LGUs and other income due to LGUs on the basis of separate regulations. Owsiak (2013, p. 143) also pointed out the controversy related to including certain sources of income as own income. The problem concerned, among other things, the participation in taxes constituting the income of the state budget (PIT and CIT). However, it is important whether the applied system solution is durable, and, thus, it constitutes a certain source of financing for the local government's own tasks. Therefore, in our opinion, the doubts related to the classification of transfers received by local government units, i.e. funds from the EU budget or the national budget,[2] which do not fall under the category of special-purpose subsidies from the state budget,[3] are justified. These funds may be transferred both by the state budget as well as by special-purpose funds. Currently, according to the applicable regulations and systematics of LGUs' income, they are included in own income, despite the fact that LGUs cannot decide on their level, rates and other administrative elements.

In this paper, the authors follow the classification in line with national regulations, and, therefore, the category of own income includes subsidies obtained from the budgets of other LGUs, funds from the EU and funds obtained other than specific-purpose subsidies from the state budget within the meaning of the applicable budget classification.

The level of revenue autonomy may be reflected by the ratio of the share of own income to total income. The increase in the revenue autonomy of LGUs will be tantamount to an increase in the level of own income in the structure of local government budget income (Szołno-Koguc, 2021, p. 7).

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[2] The category of funds that are not subsidies, but transferred from other public budgets, includes funds received from: COVID-19 Countermeasures Fund, Governmental Fund for Local Investments, National or Provincial Fund for Environmental Protection and Water Management, Labour Fund. Another example is the Polish Order Governmental Fund: Strategic Investments Programme, which at the time of writing this text is classified together with other own income such as, for example, interest income on funds accumulated in bank accounts.

[3] A detailed classification of the sources of income of LGUs has been defined in the regulation on the budget classification in force in a given financial year (Journal of Laws of 2022, item 513).

The literature on the subject indicates that the revenue autonomy of LGUs is limited, as it must fit within the limits set by law, and, therefore, an important limiting criterion is the principle of the legality of collecting public funds. As rightly noted by Surówka (2018, p. 23), local authorities are also limited by the public nature of the tasks performed. This means that they cannot infinitely increase the level of their own income, because the purpose of local government units is not to maximise profit. Therefore, if there is an excess of own income, its redistribution will take place, which should be reflected in the general subsidy mechanism.

Classification of own income should be analysed in terms of its characteristic features as proposed by the OECD. As part of the research on the level of financial independence, a set of criteria was used, including (Kim et al., 2013, p. 16):

– income that should not be assigned to LGUs,

– the scope of competence of local authorities regarding the distribution of tax revenues,

– autonomy of local government in terms of setting rates and the tax base for local taxes,

– lack of autonomy of local authorities in shaping tax rates and tax base.

It is worth noting that a reflection of the revenue autonomy of LGUs is, in particular, the criterion of decision-making by local government bodies (Kosikowski & Salachna, 2012, p. 279). The decision-making process may, therefore, include issues related to determining the rate, exemptions and redemptions, as well as methods of collecting own income and, in some cases, template forms or declarations.[4] The discussion on the level of revenue autonomy of LGUs remains valid because, as Barro (1974, p. 1116) has already pointed out, the budget deficit which is currently financed with debt in the future will be financed by increasing the tax burden for residents. At this point, the postulate expressed by Malinowska-Misiąg and Misiąg (2021, p. 24) regarding ensuring the stability and flexibility of the LGU income system remains valid. To this end, efforts should be made to establish clear rules determining when there would be compensation for the adverse effects of legislative measures. It is worth noting that the legal changes carried out in recent years in connection with the COVID-19 pandemic will significantly weaken the revenue autonomy of LGUs. This loss of income is indicated by documents such as the regulatory impact assessment accompanying the proposed bills. Although a compensation mechanism has been proposed, one of the significant drawbacks of the mechanism is the lack of autonomy of LGUs in shaping and having a real impact on the level of such income.[5]

Further in the article, a study will be presented on the relationship between the economic activity of residents and the level of revenue autonomy of LGUs. For this

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[4]   For example, the powers of the municipal council include adopting resolutions on taxes and fees within the limits specified in separate acts (Art. 18.2.8, Journal of Laws of 2022, item 559, as amended). The detailed competences of the legislative and executive authority in the field of tax and non-tax own income are specified in separate regulations.

[5]   More in (Kubalski & Czajkowski, 2022).

reason, the key to achieving the assumed goal is to define the revenue autonomy of LGUs. In reference to the literature review presented above,[6] one of the features of revenue autonomy is the possibility of local authorities having direct or indirect influence on the level of own income sources. This is related to the implementation by LGUs of their own statutory tasks. On the basis of the criterion of independence of local government authorities in terms of the impact on the amount of tax rates, the method of collecting own income and other aspects of an administrative nature, three levels of revenue autonomy can be distinguished.
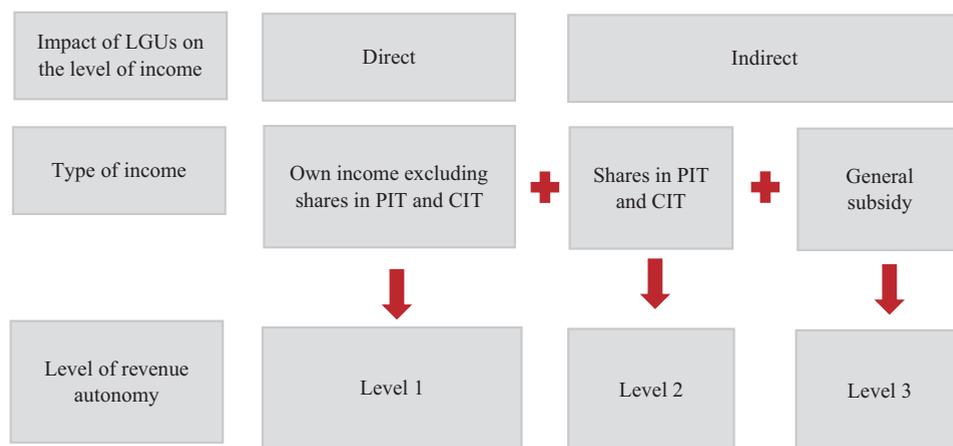

Figure 1. Levels of revenue autonomy of LGUs

Source: (Budzeń & Głębski, 2021, p. 89).

In the section devoted to empirical research, the authors proposed to study the relationship between the economic activity of residents and the Level 1 revenue autonomy. Although the shares in PIT and CIT as well as the general subsidy can also be included in the indicators of revenue autonomy (as shown in Figure 1), the first two sources (shares in taxes constituting state budget income) are a derivative of income tax paid by residents. Then, in accordance with the algorithm specified in separate regulations, these funds are transferred to LGUs. Our main goal, however, was to establish the relationship between the disposable income of residents and own income, the source of which are broadly defined payments made by the local community. And the general subsidy is not included in own income. Therefore, the adopted assumption will allow for an answer to the question of what influence the income obtained by residents has on the Level 1 revenue autonomy. Therefore, it is a derivative of the residents' interest in the investments implemented in LGUs,

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[6]   More about revenue autonomy in (Jastrzębska, 2004; Hajdys, 2017; Glumińska-Pawlic, 2003; Dziemianowicz et al., 2018; Wyszkowska, 2017).

but also of the use of paid public services provided by LGUs. Thus, the results of
the study presented below will refer to revenue autonomy in a narrower sense, i.e.
covering only own income, excluding the share in PIT and CIT.

Research methods

The analysis covers data on the amount of taxpayers' income according to the
sources of their origin declared in annual PIT statements, i.e. employment, retire-
ment and disability pensions, non-agricultural economic activity, contracts, rental,
copyrights, sale of goods, unregistered activity, other sources. The data comes from
the POLTAX system for 2015–2020 and applies to all municipalities in Poland.[7]

We have adopted two hypotheses. The first one claims that, irrespective of the
type of municipality, the structure of income earned from economic activity by
residents is dominated by income from employment and non-agricultural economic
activity. The second hypothesis assumes that, again irrespective of the type of munic-
ipality, a high correlation occurs between dominant sources of income and revenue
autonomy. In the empirical section, the comparative methodology was used with
regard to quantitative data, which allowed the authors to determine the deviations
between them. Afterwards the economic phenomena were evaluated, i.e. their char-
acter (positive and negative) and the intensity of their occurrence were determined
according to the adopted evaluation scale where the base is the starting point. The
structure of the number of taxpayers, their incomes was compared according to
sources of income, which allowed for the hierarchization of sources of income in
the analysed groups of municipalities. At a later stage, the main sources of residents'
income were analysed for correlation with the level of revenue autonomy.

Findings

First, municipalities were divided according to their formal-legal status, i.e.
urban municipalities (GM), urban-rural municipalities (GMW), rural municipalities
(GW), cities with *powiat* rights (M). Then, revenue autonomy was analysed as per
the municipalitystatus, as listed above. This is why Figure 2 presents Level 1 revenue
autonomy over the period from 2015 to 2020.

Based on data presented in Figure 2, it should be noted that total own revenue,
excluding PIT and CIT, increased in the analysed period. The exception was 2016,
when a decrease was observed in rural municipalities and cities with *powiat* rights.
However, the key conclusion in the context of the COVID-19 pandemic is that in
2020, in all analysed types of LGUs, a combined increase was recorded. In our opin-
ion, the above does not entitle us to assess the financial situation of the examined

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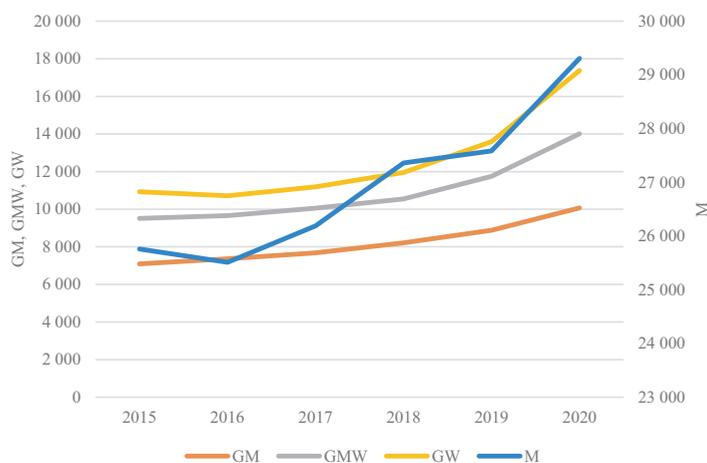[7]   The data on residents' incomes by sources are available at https://przedsiebiorczosc.monitorrozwoju.pl/

Figure 2. Own revenue excluding PIT and CIT by types of LGUs (in PLN million)

Source: Authors' own study based on (https://www.gov.pl/web/finanse/sprawozdania-budzetowe).

entities and does not indicate its improvement. At this point, one should bear in mind the aforementioned interpretation doubts regarding the definition of own income.

An important response to the COVID-19 pandemic were funds transferred from special-purpose funds, such as the COVID-19 Counteracting Fund or the Government Fund for Local Investments. Their goal was both to minimise the negative effects of COVID-19, as well as to stimulate local government investments. In accordance with the binding budget classification, it should be noted that these funds are included in own income, despite the lack of real influence on their amount by local government authorities. For this reason, Figure 3 presents the relation of own income corresponding to the Level 1 independence, excluding received funds other than subsidies, to total income. The proposed relationship will illustrate the real impact of the COVID-19 pandemic on the structure of local budgets, as well as on revenue autonomy.

When analysing the data related to the aforementioned relationship, we should first notice the significant decrease in the level of revenue autonomy, excluding the share in taxes constituting the state budget income in PIT and CIT and funds other than subsidies in all analysed years. This may be due to, for example, the introduced system changes,[8] because starting in 2016, the structure of revenues in local budgets changed significantly. In the case of the COVID-19 pandemic, a decrease in the analysed ratio is visible in 2020, but in urban, rural and urban-rural municipalities it is lower than in previous years. The exceptions are large cities, where the decline in relations in 2020 was higher than in 2017–2018. It is also worth noting that in the case of rural

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[8]   In 2016, the "Family 500+" government programme was introduced, under which funds were transferred in the form of a designated subsidy from the state budget, which, in turn, had an impact on the structure of LGUs' revenues.
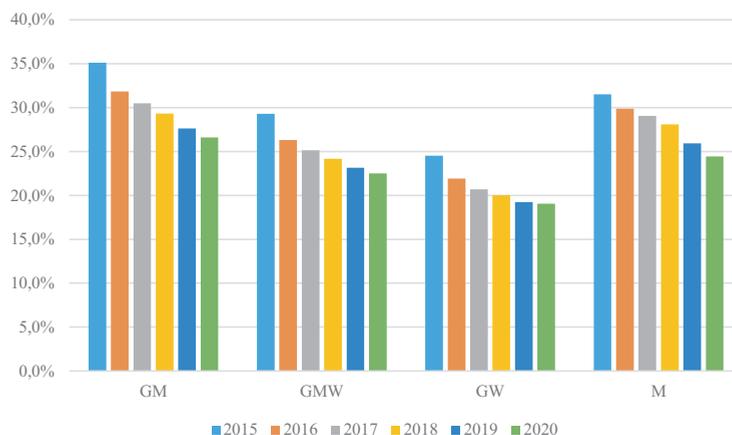
Figure 3. Own revenue excluding PIT, CIT and resources other than subsidies to total income by types of LGUs (in %)

Source: Author's own study based on (https://www.gov.pl/web/finanse/sprawozdania-budzetowe).

municipalities, the lowest decrease was recorded in 2020 compared to 2019 (-0.2 pp). According to the authors, this relates to the economic structure of these municipalities. In turn, the highest decrease in the indicator in 2020 compared to 2019 was recorded in large cities, amounting to -1.5 pp. This may mean that the effects of the COVID-19 pandemic in 2020 had the greatest impact on the income of large cities.

The above conclusions are confirmed, among others, by the 2020 report of the National Council of Regional Audit Chambers (hereinafter referred to as "KR RIO"). KR RIO noted that due to the COVID-19 pandemic, almost half of rural and urban-rural municipalities did not experience a loss in tax revenues. The financial effects of the pandemic were felt for the budgets of large cities (81.5% of LGUs) and urban municipalities (74.2% of LGUs). In addition, the effects of the pandemic in 2020 were noticeable in the operating surplus of individual LGUs, especially in large cities. The aforementioned decrease in tax revenues contributed to a decrease in the financial potential of LGUs (KR RIO, 2021, pp. 278–281).

Next, indicators of the structure of the residents' income sources were established in particular groups of municipalities. In all groups, the income structure was at a similar level, dominated by three basic sources in the following order: employment, retirement pension and disability pensions, and business activity (Table 1). Therefore, the following variables were qualified for further analysis:

X1 – level 1 revenue autonomy (own income excluding shares in PIT and CIT),
X2 – salaries and wages,
X3 – pension and disability pensions,
X4 – income from non-agricultural economic activity.

Table 1. Structure of residents' income sources

	Employment relationship	Disability and retirement pension	Business activity	Contracts	Lease	Copyright	Sale	Unregistered economic activity	Other source
GM	50.9%	24.5%	18.7%	2.8%	0.1%	0.2%	0.0%	0.0%	2.7%
GMW	51.4%	22.9%	19.8%	2.7%	0.1%	0.1%	0.0%	0.0%	2.9%
GW	51.1%	21.4%	21.8%	2.6%	0.1%	0.1%	0.0%	0.0%	3.0%
M	50.7%	20.8%	21.9%	3.6%	0.1%	0.4%	0.0%	0.0%	2.6%

Source: Authors' own study.

Comparing the structure of sources of income in the analysed period, there is a visible decrease in income from employment in all groups of municipalities (Figure 4). Increase in the structure of pension and retirement income can be seen in two groups, UM and URM. The largest increase was recorded in group C due to non-agricultural economic activity.

Figure 4. Change in the structure of income sources in 2015–2020

Source: Authors' own study.

A statistical description of the distribution of variables was made as part of the next stage of the research. The results indicate that municipalities in particular groups differed significantly from one another due to the adopted variables, as evidenced by high values of the coefficient of variation, which means low homogeneity of the studied municipalities. The results are presented in Table 2.

Table 2. Coefficient of variation of diagnostic variables in 2020

	X1	X2	X3	X4
GM	74%	81%	76%	79%
GMW	98%	102%	65%	154%
GW	84%	102%	79%	128%
M	166%	197%	131%	212%

Source: Authors' own study.

Moreover, all the variables were characterised by right-hand asymmetry (skewness coefficient), which means that municipalities with variable values below the arithmetic mean prevail. The results are presented in Table 3.

Table 3. Skewness coefficient of diagnostic variables

	X1	X2	X3	X4
GM	1.22	1.32	1.21	1.12
GMW	2.49	4.31	2.24	4.56
GW	7.37	4.04	2.23	4.71
M	5.17	5.82	4.54	5.89

Source: Authors' own study.

In the next stage, the relationship between individual variables was examined with the use of the correlation coefficient. The obtained results indicate high and positive correlation coefficients with different levels in individual groups. The results are presented in Tables 4 and 5.

Table 4. Correlation coefficient of diagnostic variables in 2015

		X1	X2	X3	X4
GM	X1	1	0.869	0.910	0.819
	X2	0.869	1	0.926	0.870
	X3	0.910	0.926	1	0.802
	X4	0.819	0.870	0.802	1
GMW	X1	1	0.834	0.795	0.747
	X2	0.834	1	0.880	0.925
	X3	0.795	0.880	1	0.784
	X4	0.747	0.925	0.784	1
GW	X1	1	0.572	0.423	0.534
	X2	0.572	1	0.848	0.886
	X3	0.423	0.848	1	0.689
	X4	0.534	0.886	0.689	1
M	X1	1	0.997	0.976	0.992
	X2	0.997	1	0.979	0.995
	X3	0.976	0.979	1	0.978
	X4	0.992	0.995	0.978	1

Source: Authors' own study.

Table 5. Correlation coefficient of diagnostic variables in 2020

		X1	X2	X3	X4
GM	X1	1	0.888	0.920	0.800
	X2	0.888	1	0.927	0.875
	X3	0.920	0.927	1	0.776
	X4	0.800	0.875	0.776	1
GMW	X1	1	0.865	0.844	0.765
	X2	0.865	1	0.886	0.928
	X3	0.844	0.886	1	0.753
	X4	0.765	0.928	0.753	1
GW	X1	1	0.725	0.615	0.672
	X2	0.725	1	0.868	0.885
	X3	0.615	0.868	1	0.704
	X4	0.672	0.885	0.704	1
M	X1	1	0.991	0.989	0.988
	X2	0.991	1	0.978	0.997
	X3	0.989	0.978	1	0.971
	X4	0.988	0.997	0.971	1

Source: Authors' own study.

As diagnostic variables have different units of measure and ranges of variation, they cannot be directly compared and added up, and have to be brought to comparability. The method of zero unitarisation was used (Kukuła, 2000). All variables are stimulants, so the following transformation was used:

$$z_{ij} = (x_{ij} - \min x_{ij}) / (\max x_{ij} - \min x_{ij})$$

Then the transformed variables were summed and divided by four (the number of variables accepted for the study) and multiplied by 100, so that the obtained synthetic indices assumed values in the range <0, 100>. Values closer to one mean that a given object is assessed higher from the point of view of the studied phenomenon. Additionally, the basic parameters characterising the distributions of synthetic variables in particular groups were calculated. The values of the synthetic variable for the last year of the analysis – 2020 – are presented in Table 6.

Table 6. Descriptive parameters of the synthetic index by group in 2020

	GM	GMW	GW	M
Max.	87.68	98.90	73.05	99.39
Min.	0.79	0.35	0.32	0.52
Average	24.92	10.92	8.30	15.85
Standard deviation	19.15	10.29	8.01	20.98
Coefficient of variability	77%	94%	97%	132%
Skewness	1.02	2.65	3.12	2.40

Source: Authors' own study.

Synthetic variables show a strong differentiation in the cross-section of individual groups, they are also characterised by right-hand asymmetry, which means that in all groups units whose values were below the average predominated. The calculated values of synthetic variables were used to identify a similar typological group in terms of their level of revenue autonomy. The mean and standard deviation were used as the basis for the division. The first group included the units with the best position, where the value of the synthetic index was greater than or equal to the sum of the average value and the standard deviation. Due to the large numbers in the groups, in Table 7 only the first and last five units in the best typological group are shown.

Table 7. Classification of selected units according to the value of the synthetic index

	Highest values			Lowest values	
GM	Ostrów Wlkp.	77.54	GM	Sulmierzyce	0.79
	Głogów	77.89		Obrzycko	1.05
	Tarnowskie Góry	77.99		Łęknica	1.13
	Pruszków	79.34		Stoczek Łukowski	1.19
	Lubin	87.68		Nieszawa	1.36
GMW	Swarzędz	54.66	GMW	Suraż	0.35
	Grodzisk Mazowiecki	54.99		Nowe Warpno	0.46
	Nysa	55.77		Kleszczele	0.52
	Wieliczka	57.43		Brok	0.65
	Piaseczno	98.90		Wyśmierzyce	0.66
GW	Komorniki	58.61	GW	Przytuły	0.32
	Kobierzyce	60.14		Regnów	0.36
	Długołęka	67.32		Krempna	0.47
	Lesznowola	68.28		Podedwórze	0.52
	Tarnowo Podgórne	73.05		Rudka	0.58
M	Gdańsk	57.42	M	Tarnobrzeg	0.52
	Poznań	69.97		Świętochłowice	0.81
	Łódź	82.17		Krosno	0.93
	Wrocław	86.28		Biała Podlaska	1.06
	Kraków	99.39		Skierniewice	1.28

Source: Authors' own study.

Discussion and conclusions

Research findings allowed the authors to verify the hypotheses adopted. The first hypothesis claiming that the structure of income earned by the residents is dominated by income from employment and non-agricultural economic activity has been partially confirmed. The main source of economic activity of residents is income from employment, however, the second source is income from pensions and disability pensions, and the third is income from non-agricultural business activity. This relation is reversed in case of clusters of large cities. Here, the total value of income generated by business activity is the second most valuable stream in the structure. Changes in the income structure are visible in the analysed period. In all

groups of municipalities in 2020 there is a decrease in the share due to employment compared to 2015, which may cause problems on the labour market as a result of the COVID-19 pandemic.

The research confirmed the adopted second hypothesis that there is a high correlation between the dominant sources of income and revenue autonomy, regardless of the formal status of a municipality. However, it is worth noting that despite the high positive values, there are differences between the groups. In the group of large cities, these values are close to one, while in the group of rural municipalities, these values range from 0.4 to 0.7.

In the analysed period, the correlation coefficients remained practically at the same level in individual groups of municipalities. The largest correlation between revenue autonomy and individual sources of taxpayers' income occurs in the group of large cities. Slightly lower rates are found in the group of urban and urban-rural municipalities. The lowest (but still high on the scale) coefficients are found in the group of rural municipalities, which may indicate that in this group the level of revenue autonomy is also significantly influenced by other factors that are not directly related to the economic activity of the municipality residents. Such income includes the purchase of services by other LGUs, revenues from tax revenues related to the activities of legal persons in a given municipality and other obligatory levies, the payment of which is determined by law and does not result from the state of wealth of the society.

The above indicates that the revenue autonomy of the surveyed entities is undoubtedly related to the economic activity of the residents. On the other hand, the aforementioned high correlation in the case of large cities confirms that in this case the mentioned activity is an endogenous factor of local development. In the other types, a slightly lower correlation also prompts the authors to formulate a similar conclusion. The presented results directly relate to the endogenous theories of local development presented in the first part. Moreover, the high correlation confirms the impact of the COVID-19 pandemic both on the financial potential of local government units and the strong relationship with the economic activity of residents. In the part on revenue autonomy, it has been proven that in 2020 (the first year of the pandemic), the financial possibilities, especially of large cities, have shrunk. The phenomenon is visible, for example, in the case of own income, excluding shares in taxes constituting the state budget income and excluding funds received (e.g. from special-purpose funds) other than specific-purpose subsidies. Moreover, the Regional Audit Chamber indicated the reduction of financial possibilities, especially of large cities, while Budzeń and Głębski (2021, p. 95) noted that in 2020, the number of municipalities and large cities with an operating deficit increased (from 28 in 2019 to 35 in 2020), and the effects of the tax policy of LGUs with a negative current result increased significantly (from PLN 28.5 million in 2019 to PLN 69.3 million). Thus, on the one hand, LGUs actively used instruments related to various types of reliefs for residents in connection with the difficult financial situation, but on the other hand, the operating deficit was deepened. In the context of the financial potential, this is

a dangerous phenomenon because it shows that local government units essentially exhaust the possibilities of supporting the economic activity of residents, including business activity, through an active tax policy, and more specifically through the use of reliefs and redemptions. For example, in 2010, the effects of tax policy, the so-called potential income that could be obtained in these local government units, amounted to PLN 577.6 million. Thus, in the context of PLN 69.3 million (2020), it should be noted that the option to support residents' economic activity decreased.

According to the authors, the above is also a result of systemic changes implemented throughout this period, which brought about changes in the structure of budget revenues. This is confirmed by the lowest level of tax policy effects in 2016–2018, in which they were at the level of: PLN 12.0 million, PLN 6.8 million and PLN 11.5 million. This is a particularly important observation in the case of rural municipalities, where the correlation between revenue autonomy and selected forms of income generation by residents ranges between 0.4 and 0.7. In the case of economic activity, it is 0.53 (2015) and 0.67 (2020). Thus, the question concerning the factors of the financial potential of rural municipalities is justified. In this case, the economic activity of residents is not the main factor determining the level of own income. Positive correlation coefficients showed that the relationship exists, but not as strong as in the case of other types of LGUs. At this point, it should be noted that one of the determinants may be other conditions and economic activity of non-residents of the municipality or of legal persons, which were not taken into account due to the span of the research sample and the purpose of the study. The activity of people who are not residents is important, because in some municipalities of this type, a health resort and local tax has been introduced. However, the main purpose of the resort and local tax was to increase budget revenues. Thus, the conclusion formulated in this way corresponds to the results of other studies related to the subject of local fees (Budzeń & Kańduła, 2021, p. 221; Kwaśniewski & Majewska, 2016, pp. 97–120).

To recapitulate the findings, definitely the main goal of the study, i.e. assessment of local economic activities by sources of income, and pinpointing the relationships between them and the development potential of municipalities in Poland, was achieved. It was established that there is a relationship between individual sources of economic activity of residents and the revenue autonomy of local government units. In addition, another finding of the study was to identify the effects of the COVID-19 pandemic on the economic activity of residents and the revenue autonomy of the surveyed LGUs. This is evident primarily in how much the structure of residents' income has changed. These findings also support the conclusions arrived at by the Central Statistical Office on the economic activity of residents and the Association of Organisers of Innovation and Entrepreneurship Centres in Poland in the field of innovation and entrepreneurship centres in Poland.[9] On this basis, it was established that the COVID-19 pandemic has negatively influenced the structure of the labour

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[9] The key conclusions are presented in this paper in the literature review section.

market and the sources of economic activity of residents, as well as the financial situation of LGUs (in particular in cities with *powiat* rights). The results obtained have important practical implications as till this very day, attention is paid mostly to the importance of endogenous factors for local development, a view that is confirmed by the literature review and publicly available data sources.[10] However, the research conducted confirms the existence of a correlation between residents' economic activity and local government budgets. Having revealed such correlation, the authors strongly recommend that any local development strategy be developed following an analysis of residents' economic activity, e.g. by source of income or age. Moreover, for the sake of active tax policy, it would be highly advisable for the authorities to research the relationship between economic activity and local government budget, including tax revenues.

It would be of benefit for decision-makers if this analysis was followed by further research into endogenous development factors and LGUs' potential for greater financial autonomy. Hence, in a follow up to this research, focus should be put first on demographics and labour market. In such a way, the cognitive, knowledge-broadening function of research can be translated into practical conclusions and serve the purpose of developing informed and efficient development strategies. Last but not least, such research can also support supra-local cooperation with other LGUs or partners (including business, residents or non-governmental organisations).

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[10]   One of the sources of data on the economic activity of residents is the IT tool of the Association of Polish Cities called the Local Development Monitor (https://monitorrozwoju.pl/), one of the components of which is the so-called MRL Entrepreneurship (https://przedsiebiorczosc.monitorrozwoju.pl/).

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