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Janusz Nesterak

Sustainable Public Management and Institutional Social Responsibility in Practice: A Study of Four Challenges in the Polish Context

Contemporary public, local, and institutional management is increasingly confronted with the imperative to redefine its priorities towards an integrated, sustainable, and participatory approach. In the face of mounting pressure from rising societal expectations, constrained financial resources, and intensifying systemic crises – such as housing shortages, the progressive devaluation of the education sector, and social alienation – the question of the purpose and configuration of modern institutional responsibility resurfaces with renewed urgency.

The transformation of management models towards integrated and participatory frameworks requires not only a paradigmatic shift but also the implementation of novel analytical tools and managerial practices. A transdisciplinary approach becomes essential – one that synthesises knowledge from the social sciences, ecology, economics, and digital technologies. As demonstrated in the work of Ward and colleagues (2020), integrated management is grounded in cross-sectoral collaboration, translational science, and the active engagement of local communities in decision-making processes. The authors emphasise that the effectiveness of such models is contingent upon institutions' capacity to build relationships, foster mutual learning, and assume co-responsibility for implemented solutions.

Similarly, Ortiz-Riomalo and colleagues (2023) highlight the relevance of institutional frameworks such as the Institutional Analysis and Development (IAD) and Social-Ecological Systems (SES), which enable the examination of complex interactions among actors, contexts, and decision-making arenas. Their research on participatory water resource management in South America illustrates that the success of interventions hinges on the integration of multiple governance levels and institutional adaptability.

Finally, the watershed management approach, as outlined by the authors of a chapter in a Springer monograph (Wagley & Karki, 2020), illustrates the practical dimensions of implementing integrated and participatory models. Central to this approach is consensus-building, the strengthening of local institutions, and the creation of spaces for co-decision-making.

All these frameworks converge on the necessity to redefine the role of public institutions from resource administrators to facilitators of cooperation and social innovation. In this context, the case studies presented herein serve not only as illustrations of ongoing transformations but also as conceptual entry points for further reflection on the future of public governance under the conditions of uncertainty and complexity.

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The first case concerns the implementation of participatory budgeting in municipalities with diverse socio-territorial profiles. Although its use in Poland remains relatively limited, international research indicates that even basic forms of citizen participation can contribute to enhanced social capital, trust, and the legitimacy of public authorities (Schommer, 2023). Examples from Porto Alegre, Madrid, and Toronto suggest that participatory budgeting can function not only as a tool for resource redistribution but also as a platform for civic education and the strengthening of deliberative democracy (Aziz & Shah, 2020). Participatory budgeting thus operates as a mechanism for rebuilding public trust and enabling local communities to co-determine the allocation of public funds. While participatory budgeting models differ in their methodological and institutional designs, they consistently demonstrate the potential to enhance deliberative democracy and foster inclusiveness.

The second case concerns a critical evaluation of the mechanisms for financing higher education in Poland. In the global context, there is a growing discourse emphasising that higher education should be regarded as a public good rather than merely a private investment. Nixon (2020) underscores that the sustainability of education systems requires not only stable funding sources but also the recognition of education as a cornerstone of a democratic society. Newfield (2021) argues that the current funding model – based on student debt and inter-institutional competition – exacerbates social inequalities and contributes to the erosion of the quality of education. Within this framework, there is an urgent need to reform indexation mechanisms and reinforce the state's role as a guarantor of equitable access to education. Consequently, the financing of higher education emerges as a pressing challenge to the common good. A detailed analysis reveals a growing divergence between economic growth and the real level of funding allocated to universities. According to Newfield (2021), the prevailing funding paradigm not only deepens inequality but also weakens the quality of education as a public good.

The third case explores the potential of container housing as an alternative form of residential provision in Poland. Considering rising real estate prices and a persistent shortage of social housing, such solutions may offer a practical response to the needs of economically marginalised groups. When appropriately designed and implemented, container-based housing has the potential to support social inclusion and improve quality of life, particularly when accompanied by participatory planning and community engagement. However, as noted by Qi and colleagues (2024), the effectiveness of such interventions depends on the integration of housing policy with educational and social initiatives, as well as the design of public spaces that foster community-building and social cohesion. Container-based housing, as a response to the housing crisis, represents an innovative solution that may become increasingly attractive. Nonetheless, it demands from public institutions not only infrastructural investment but also the integration of housing strategies with broader socio-educational programmes, ideally supported by business-aligned models of implementation (Garnham et al., 2025).

The fourth case addresses location-based games as tools for city branding and urban education, focusing on the use of applications such as *Pokémon GO*. As Leorke (2019) demonstrates, these games not only engage users with urban space but also generate new forms of local identity and urban narratives. Location-based games function as vehicles for contemporary city marketing while also serving as educational instruments that support situated learning and the development of place-based relationships. Baalsrud Hauge and colleagues (2019) emphasise that well-designed location-based games can enhance participatory processes, promote cultural heritage, and strengthen the sense of community belonging. They also facilitate the creation of impersonal

yet meaningful connections with specific urban environments, reinforcing spatial attachment and civic engagement.

A unifying theme across all these case studies is the need for a governance model that integrates not only economic efficiency but also social justice, inclusivity, and the long-term sustainability of solutions. The proposed approach synthesises traditions from public administration, multilevel governance theory, and values-based management, constructing a framework for institutional resilience and social responsibility.

In conclusion, it becomes increasingly evident that contemporary public management – both at the local level and at the institutional level – requires a fundamental transformation. The complexity of today's social, economic, and environmental challenges calls for a governance model grounded in integration, sustainability, and active civic participation. Only such an approach can foster institutions capable of acting effectively under the conditions of uncertainty while remaining committed to the principles of social justice, inclusiveness, and long-term accountability. Thus, the redefinition of public management priorities emerges not as a strategic option, but as a necessity dictated by the realities of the present.

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Anita Perska, Magdalena Stefańska

Participatory Budget as a Form of Social Participation: The Example of Communes in Poland in 2020–2022

Abstract

Objective: In the process of managing a commune, the needs of the community inhabiting the area of a given commune are met, and the commune budget constitutes the basis of the commune's financial management. The commune budget is an annual plan of income and expenses as well as the commune's revenues and expenditures. Communes enable the residents to decide how to spend part of the budget in the form of a participatory budget. The aim of this article is to identify and assess the activity of various types of communes in the field of participatory budget planning in Poland, as well as to explain the reasons behind differences in the level of the commitment.

Research Design & Methods: Selected literature references in the subject scope of the article are analysed. In addition, an analysis of secondary data was performed regarding the number of communes with a planned amount of participatory budget. The analysis is conducted considering the criterion of the type of commune (rural, urban, rural-urban). The time scope of the analysis covers the years 2020–2022.

Findings: The share of communes that invite inhabitants to participate in the decision-making process on how to spend part of public money as participatory budget is quite low. In the years 2020–2022, 12.27%, 11.18%, and 12.92% of all communes in Poland planned a participatory budget. In 2021, compared to 2020, there was a smaller number of communes that had a planned participatory budget. This could be due to the COVID-19 pandemic that had been ongoing since 2020. The level of offering communities the participation in the decision-making process differs in various types of communes, and that differentiation is statistically valid. Since the sources of such differences mainly can come from social, cultural, economic, or political reasons, they were explored more deeply.

Implications / Recommendations: Due to the diversity of the types of communes in terms of population, it is recommended that an analysis be conducted according to the discussed determinants. The results may be helpful for local managers in terms of including them into the local sustainable strategy participatory budget instrument and following Sherry Arnstein's (2019) ladder process while considering local constraints and opportunities.

Contribution / Value Added: The exploration of participatory budget mostly concentrated on larger urban communes. However, the delved analysis of the implementation of participatory budget in rural or rural-urban communes was not so popular. The added value is the analysis according to the type of communes as well as the discussion on the reasons behind such differences. The paper contributes to the discussion of the stimulators and inhibitors of the implementation of such a tool in creating locally social capital and tightening relations among different stakeholders in the name of common good.

Keywords: local government; participatory budget; public management

Article classification: research article

JEL classification: H7, O2, R5

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Introduction

One of the basic tasks of local governments is to take care of the development of their areas and to ensure high quality of the life and well-being of residents. Local governments are responsible in particular for education, safety, health care, public transport, road condition, utilities (water, sewage, sewage disposal and treatment), order, social assistance, spatial order, real estate management, access to culture, and several other issues of key importance to residents. The ability of local governments to perform tasks is usually limited by the budgets they have at their disposal, hence the priority tasks included in commune strategies and current tasks result from changes taking place in the environment. The framework of their activities is determined by legal regulations, which is why the communes' strategies indicate in what period and what tasks, usually of an investment nature, will be implemented.

However, such a framework of action does not limit the possibility of involving residents in the development of their commune. They have the opportunity to co-decide on investments that are close to them and improve the quality of life, such as building local playgrounds, improving the quality of roads, taking actions to improve safety, greening the area, etc. (Touchton et al., 2024). An approach where a citizen is strengthened in service creation, design, production, or initiation is called the co-production of public value (Ćwiklicki, 2019; Ćwiklicki & Plich, 2020). This purpose is served, among others, by participatory budgets, also known as citizen budgets. Over the last two decades, there has been a significant increase in researchers' interest in this tool for residents' co-deciding about investments in their immediate surroundings (Milosavljević et al., 2023). Previously, it had been present, or rather initiated, in Brazil and generally in South American countries and cities (Wampler et al., 2021). In Poland, in the first edition of the participatory budget, investments were made in Sopot, including the improvement of the quality of road infrastructure (Krasnowolski, 2020). Only after 2000 did this idea begain to penetrate other regions of the world, including European countries (Klimovsky et al., 2021; Sintomer et al., 2008; Sorychta-Wojsczyk, 2015).

The objective of this article is to identify and assess the activity of various types of communes in the implementation of participatory budget in Poland and the explanation of the reasons behind the differences in their level of commitment. The time scope of the analysis covers the years 2020–2022. The source of secondary data is the Local Data Bank of the Central Statistical Office (GUS BDL). The following structure was adopted in the study. The first part presents the issue of participatory budgeting and the development of the use of this tool in Poland. The second part refers to the author's own analyses, conducted on the basis of data from secondary sources, whose aim was to verify the hypotheses. The next part formulates conclusions and indicates limitations and recommendations for the future.

Literature review

Theoretical foundations

Participatory budget (PB) is perceived as a sustainable management tool (Sinervo et al., 2024) through which citizens can influence public administration and add significant value to sustainable development from the democratic perspective. According to the United Nations Commission for Economic and Social Affairs (2010), PB should consider eight main features

related to good governance. These include participation, consensus, responsibility, transparency and responsiveness, effectiveness and efficiency, fairness, non-rejection of any groups or individuals, and the rule of law (Xu et al., 2015). As a concept, PB fits into both New Public Service and New Public Governance, among other things (Table 1).

Table 1. A comparison Among the Traditional PA, NPM, NPS, and NPG

	Traditional public administration and management	New public management	New public service	New public governance
Value orientation	Regime & procedure	Efficiency	Democracy	Democracy & efficiency
Theoretical basis	Bureaucratic system, political & administrative dichotomy	Economics theory, the management philosophy of private sector	Democratic citizenship, civic society, the humanistic theory of organisation, postmodern administrative theory	Contractualism, integrity theory, collectivism
Behaviour	Policymaking & execution-separating, centralised government	Government service outsourcing & marketing	The cultivation of government service spirit, cooperation with the third sector	Citizen independence, public deliberation, polycentric governance
The role of a citizen	Leader	Customer	By the service of the citizens	Participating in decision-making
Research method	Institutionalism research method	Positivism research method	Humanism research method	Collectivism research method

Source: Xu et al., 2015, p. 13.

The meta-analysis of articles, conducted by Schugurensky and Mook (2024), locates PB in the theory of change. Following the theory, PB consists of four stages of change: inputs, activities, outcomes, and impact. At the input stage, designated resources are allocated for use by the involved parties. The utilisation of these resources depends on a range of factors that define the specific context. During the activities stage, an action plan is formulated and the ideas are collected, developed, and subjected to a voting process. The projects chosen through this process are subsequently implemented. The process concludes with the monitoring and evaluation of results, including the generated impact.

The study conducted by the NGO organisation called People Powered (2022) identified different types of impact, i.e. on people, communities, and government itself as consequences of PB implementation by local managers (Wampler et al., 2022, pp. 2–15) (Table 2). Moreover, the change triggered by the implementation of PB may be economic or environmental in nature. However, due to the involvement of many stakeholders, a significant social impact occurs, which leads to a change in the knowledge, attitude, and behaviour of the involved stakeholders (Bachnik et al., 2024).

Participatory budgeting can also be considered as a tool applied at the highest level on Sherry Arnstein's ladder of participation (Arnstein, 2019, 1975; White & Langenheim, 2021). It is a form of the socialisation of local authorities that treats citizens as partners for dialogue, makes them co-responsible (empowerment) for the shape and development of a local government unit, and also

gives the right to conduct citizen control, thus expecting transparency in the spending of public money. It is also a form of social activation that aims at obtaining bottom-up initiatives from citizens that will not be imposed centrally, in a hierarchical, traditional system of local authorities. The ideas, with their support, will be the subject to voting, selection, and implementation. Their implementation creates space for dialogue between various stakeholder groups and contributes to the integration of local communities in order to achieve goals that are beneficial to all residents. At the same time, residents have the opportunity to integrate internally in order to increase their chances of obtaining a budget and implementing the initiative. Moreover, participatory budgeting can be a way to induce a psychological effect among residents in the form of a sense of their own agency. Another issue related to participatory budgeting is the increased transparency of local authorities' policies, which results in trust in decision-makers. It is also worth adding that this method can accelerate the implementation of a task for which previously there had been no financial resources or the financial resources had been insufficient.

Table 2. The impact of PB on three types of stakeholders

– Participants	– Communities	– Government
– new civic and political knowledge; – developing stronger civic, political, and deliberative skills; – the adaptation of new attitudes, values, and dispositions; – promoting mutual trust between participants, governments, and educational institutions; – increasing voting in regular elections; – enhancing non-electoral, individual-level political participation such as contacting elected officials and proposing solutions to community problems; – designing and implementing BP impacts the civic engagement gap; – impact on knowledge, skills, attitudes, and behaviours.	– lower infant mortality of PB; – building budget literacy among community leaders; – communities that accessed more money per capita have seen greater participation; – collaboration with civil society organisations improves participation; – more collaborations by civil society organisations if collective action is encouraged; – less formal collective action.	– more local tax revenues, as residents may be more willing to pay taxes; – local governments spend money differently, allocating more resources to areas such as housing, health care, education, water and sewage infrastructure, as well as parks and recreation; – owing to PB, local governments redirect government spending to low-income communities, especially when it applies equity criteria; – the impact of BP differs across locations.

Source: Based on Wampler et al., 2022.

According to Kalisiak-Mędelska (2011), the generation of conscious and active citizens and the creation of civic structures and community identity is the power of social participation. On the other hand, despite the existing legal regulations, the introduction of, e.g., a village fund for villages, as indicated by Bednarska-Olejniczak et al. (2020), depends on the political will of the legislative authorities of local government and on the willingness of the residents to participate in making decisions regarding the directions of expenditure. Nevertheless, the village fund, despite initial concerns, proved to be effective in Poland, especially owing to the autonomy of local communities and significant financial incentives (Sześciło & Wilk, 2018).

Cabannes and Lipietz (2018) note that PBs can be threefold in nature. Firstly, they may be territorial and refer to a community, district, city, or region. They are then „spatial" instruments of budget redistribution and governance. Secondly, they may concern specific issues such as

transport, housing, education, environment, or local economic development. They may also refer to specific social groups, e.g. excluded for some reasons, for which financial resources will be allocated, e.g. people with disabilities.

It is necessary to emphasise that PB is also a form of the implementation of the Sustainable Development Goals, in particular: goal 4 – ensuring inclusive and equitable high-quality education and promoting lifelong learning opportunities for all; goal 6 – ensuring the availability and sustainable management of water and sanitation for all; goal 11 – making cities and human settlements inclusive, safe, resilient, and sustainable; goal 15 – protecting, restoring, and promoting the sustainable use of terrestrial ecosystems, sustainable forest management, combating desertification, and stopping and reversing land degradation as well as halting the loss of biodiversity (Svobodová & Olejniczak, 2020; Touchton et al., 2024).

Participatory budget in Poland – previous experience and selected research results

According to the interpretation cited by Krasnowolski in the Polish Senate documents (2020), participatory budget, also often called civic budget, is a democratic process in which residents co-decide on the allocation of part of the budget of a local government unit, in the percentage of public expenditure determined by local government bodies in a budget year (Krasnowolski, 2020). It is assumed that Sopot was the first city in Poland to introduce a participatory budget in 2011, but significant changes in legal regulations were introduced only in 2018. As Sorychta-Wojsczyk (2015) notes, the legal basis on which local governments relied when introducing the participatory budget was the institution of consultation with commune residents, in accordance with Art. 5a of the Act on Commune Self-Government of 8th March, 1990. At that time, participatory budget in Poland was organised on an informal basis as public consultations, and local authorities agreed to respect its results as an unwritten agreement. Significant changes were introduced under the Act of 11th January, 2018, amending certain acts in order to increase citizens' participation in the process of electing, functioning, and controlling certain public bodies. The provisions on participatory budget – introduced by the Sejm in 2018 in the acts on commune, county, and voivodeship self-government – define participatory budget as a special form of consultation. The obligation to organise participatory budgets was imposed on all cities with county rights, while for other urban, urban-rural, and rural communes, the introduction of such a budget is optional (the decision in this regard is made by the commune council) (Martela et al., 2023; Polish Act of 8th March, 1990, on Commune Self-Government[1]).

The establishment of participatory budget for communes that are cities with county rights is obligatory, and its amount is at least 0.5% of the commune's expenses included in the last submitted report on the implementation of the budget (Act of 8th March, 1990, on Commune Self-Government, Article 5a, section 5). It is possible to divide funds spent within the participatory

[1] Act of 8th March, 1990, on Commune Self-Government, art. 5a, section 1 stipulates that in the cases provided for by the Act and in other matters important for the commune, consultations with the inhabitants of the commune may be conducted on its territory. In section 3, it is stated that participatory budget is a special form of social consultations. The legislator further specifies that as part of the participatory budget, residents decide annually in direct voting on part of the commune budget expenditure. The tasks that will be selected as part of the participatory budget are included in the commune budget resolution. In the course of work on the draft budget resolution, the commune council may not remove or significantly change the tasks selected under the participatory budget (Act of 8th March, 1990, on Commune Self-Government, Art. 5a, section 4).

budget into pools covering the entire commune and its parts or project amounts covering the entire commune area or its parts (Act of 8th March, 1990, on Commune Self-Government, Art. 5a, section 6). It should be noted that in 2022, the legal situation changed regarding both the obligation to organise participatory budgets, which was imposed on cities with county rights, and the method of allocating pools (Martela et al., 2023).

Research conducted on participatory budget in Poland is often limited to a specific area (e.g. voivodeships, cities, metropolises) and does not cover the entire country. For example, research conducted by Jeran et al. (2018) focused on the Wielkopolska voivodeship. The researchers noted, among others, that the share of the participatory budget in the Wielkopolska region in the total commune budget (expenditures) was 0.59%, while in the commune's assets expenditure, it was 4.31%. Moreover, these researchers confirmed that the wealth of a commune is not a factor differentiating communes implementing a participatory budget from those not implementing it, and that communes implementing a participatory budget are characterised by a higher synthetic indicator of social activity. Ostachowski (2021) analysed the activity of local communities in the indicated scope on the example of the Świętokrzyskie voivodeship, paying attention to the impact of the COVID-19 pandemic on the use of this region's participatory budget. In turn, an analysis of participatory budgeting on the example of small towns in the Silesian voivodeship and the Łódź voivodeship was conducted by Sobol and Rzeńca (2018). Large cities were also the subject of scientific research (Brol & Derlukiewicz, 2023) and prepared reports, e.g. the City 2077 Report compared the share in the participatory budget in the six largest cities in Poland (Miasto 2077, 2019). Metropolises were also the objects of research in the field of participatory budgeting, an example of which is an analysis of the experiences of selected metropolises in Poland and Ukraine (Kudłacz & Zhebchuk, 2019).

Participatory budget as part of the activation of citizens in cities in Poland in 2022 was conducted in 250 centres, i.e. 43.5% of cities with over 5,000 inhabitants. Regardless of the size of the city, the share of voters in the budgets does not exceed 14%, and on average it is 11% (Martela et al., 2023). The authors of the report on the participatory budget note that as the size of the centre measured by the number of inhabitants increased, the possibility of choosing more expensive and more complex projects was higher (Martela et al., 2023). However, it is worth noting that in 2022, cities reserved a total of 630.5 million PLN for the implementation of the winning projects (Martela et al., 2023). In Poland, thematic projects related to greenery and recreation are the most frequently chosen ones. On average, they constitute approximately ¼ of the tasks selected in voting. Road investments come second, and those related to kindergartens and schools come third (Martela et al., 2022).

Research methodology

Based on the literature analysis and a review of studies and reports on the participatory budget in Poland, a research gap was identified regarding the identification of the activity of various types of communes in Poland in the implementation of the participatory budget. The lack of research covering types of the communes may be due to the fact that only a dozen or so years have passed since the first participatory budget was introduced in Poland. The Central Statistical Office provides data in this area for the years 2020–2022.

The article analyses the variable of the amount of the participatory budget planned in the commune, which in this article is identified with the term 'planned participatory budget'. Due to

the fact that the database of communes downloaded from the Central Statistical Office that have planned a participatory budget includes only those communes that have planned such a budget, the first step was to create a database of all communes in Poland with the assigned participatory budget amount. The allocation of the participatory budget amount to each commune had to be analysed separately for each year, because the status of communes changed in the analysed years and there were different numbers of communes of a given type (Table 3). An in-depth analysis of the number of communes by type limited the risk of a commune appearing twice in the developed database.

Table 3. The number of communes in Poland by type in 2020–2022

	Urban communes	Share	Rural communes	Share	Urban-rural communes	Share	Total	Share
2020	302	12.2%	1,533	61.9%	642	25.9%	2,477	100%
2021	302	12.2%	1,523	61.5%	652	26.3%	2,477	100%
2022	302	12.2%	1,513	61.1%	662	26.7%	2,477	100%

Source: Own elaboration based on the Centre of Statistical Information Technology (Centrum Informatyki Statystycznej, 2024).

In each year covered by the study, there were a total of 2,477 communes located in Poland. In the years 2020–2022, rural communes dominated in Poland in terms of number, followed by urban-rural and urban ones. Additionally, among urban communes, 66 cities with county rights which were obliged to implement a participatory budget were identified.

The time scope of the study (2020–2022) is the period during which there was the COVID-19 pandemic in Poland, as in other countries in 2020 and 2021. It caused a number of socioeconomic changes, including those in participation and the perception of participatory budgeting (Ostachowski, 2021). Moreover, as the report covering the first two years of the pandemic indicates, 29% of local governments with more than 5,000 inhabitants resigned from implementing the participatory budget in 2021, and 43% of local governments other than cities with county rights (those are obliged by law) withdrew from implementing a participatory budget. Online activities were the main activities of those units that decided to implement the programme, and 40% of communes want to keep online methods for the future or limit some elements of the process to them (such as voting and submitting projects).

The analysis of data regarding the planned amount of the participatory budget in Poland was divided into two parts – a general analysis of this variable for communes according to their type and an in-depth analysis in which a hypothesis was formulated and the $\chi 2$ (chi-square) test of independence was used. During the general analysis of planned participatory budget by communes in Poland, the following general research questions were raised:

1. What part of communes in Poland has planned the amount of participatory budget?
2. Are there differences between types of communes in Poland in terms of:
   a) the planned average amount of participatory budget?
   b) the average planned amount of participatory budget per capita?
3. Why do differences between types of communes in Poland in the use of participatory budget exist?

Considering the theoretical part of the article, including the research conducted in the subject area and the state of the recognition of the studied phenomenon in Poland, the research hypothesis is: H_1: There is a relationship between planning a participatory budget by communes and their type.

Due to the obligation to implement a participatory budget by cities with county rights, they were excluded from the study of the chi-square independence test (the analysis was conducted for other urban communes as well as urban-rural communes and rural communes). The Statistica software 13 was used for calculations.

The results and discussion

As stated before, creating a participatory budget in Poland is an obligation for communes that are cities with county rights (Act of 8th March, 1990, on Commune Self-Government, Art. 5a, section 5), while for others, i.e. urban, urban-rural, and rural communes, it is a voluntary action.

In 2020, a total of 304 communes in Poland planned a participatory budget, in 2021 – 277 communes, and in 2022 – 320 communes, which constitutes 12.27%, 11.18%, and 12.92% of all communes, respectively (Figure 1). In 2021, compared to 2020, there was a smaller number of communes that had a planned participatory budget. This could be due to the COVID-19 pandemic ongoing since 2020 and the introduced special solutions related to the prevention, counteracting, and combating of COVID-19. During the epidemic situation, it is recommended that direct interpersonal contacts be limited. This period was a challenge for the local government in terms of the organisation of public services, lower budget revenues (resulting from restrictions on business activity imposed by the government), or incurring additional expenses necessary to ensure sanitary safety in subordinate facilities (Foundation for the Development of Local Democracy named after Jerzy Regulski, 2021).

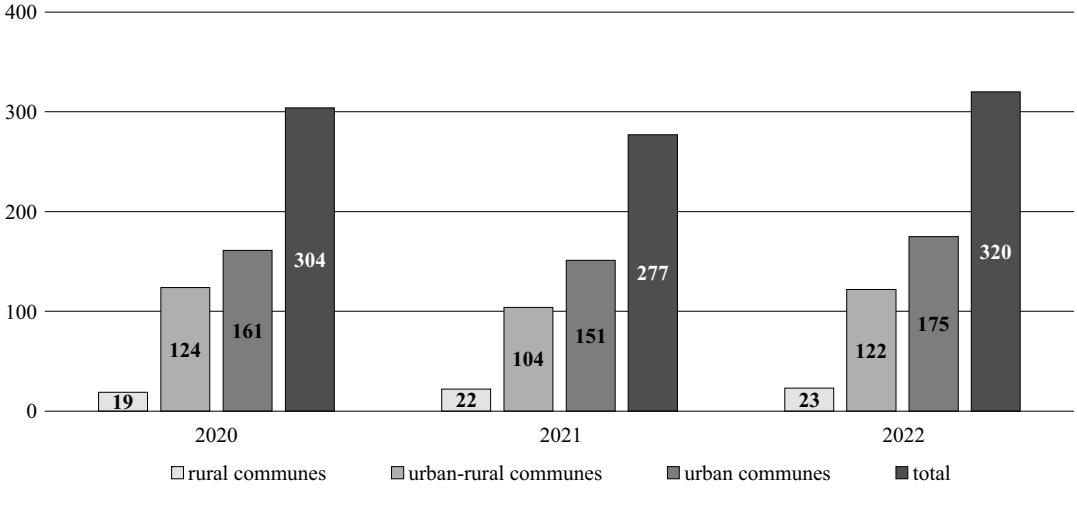

Figure 1. The number of communes that planned a participatory budget in Poland in 2020–2022 according to the type of commune criterion

Source: Own elaboration based on GUS BDL.

In 2020, all cities with county rights had a planned participatory budget (which results from the above-mentioned legal regulations), while in the following two years, one city had an analysed budget of zero. The total number of urban communes and the total number of urban-rural communes that planned a participatory budget in 2021 was lower than in 2020, and in 2022 it was

higher than in 2021. In turn, the total number of rural communes in terms of the tested feature was higher in 2021 than in 2020, and in 2022 it was slightly higher than in 2021.

In order to notice regularities in the activity of individual communes according to their type, it is worth exploring the share of communes planning a participatory budget in all communes of a given type. Significant differences are observed in the share of communes of particular types in terms of activity in the examined area (Figure 2). In 2022, over half of urban communes (approx. 57.95%) had the planned amount of participatory budget. This group of communes also includes cities with county rights. In accordance with the Act of 5th June, 1998, on County Self-Government (Article 92, section 2), they are communes performing county tasks on the principles specified in this Act. These cities are specific in terms of the analysed feature, because, as mentioned above, the creation of a participatory budget is obligatory for them, which results from the legal regulations referred to. A total of 65 cities with county rights (out of 66 communes with such status) demonstrated the creation of a participatory budget, which constitutes 98.48% of the total. In turn, if the group of urban communes with a planned participatory budget excluded cities with county rights, then approximately 46.61% of the remaining urban communes had a participatory budget (excluding cities with county rights). Moreover, approximately 18.43% of urban-rural communes and only approximately 1.52% of rural communes had a planned amount of participatory budget. However, this does not translate into a low level of activity of these communes in involving residents in co-deciding on part of the budget, because, as mentioned in the theoretical part, they can create and implement a village fund, which is referred to as a special form of participatory budget. Community funds might be introduced only in rural or urban-rural communes that created special auxiliary units for rural areas, called communities or villages [Pol. *sołectwa*]. Rural communes cover only rural areas (villages), while urban-rural communes consist of a town and the surrounding rural areas (villages) (Sześciło & Wilk, 2018). In 2021, the number of communes with village councils was 2,173, and the number of communes with a separate village fund was 1,498 (MSWiA, 2024).

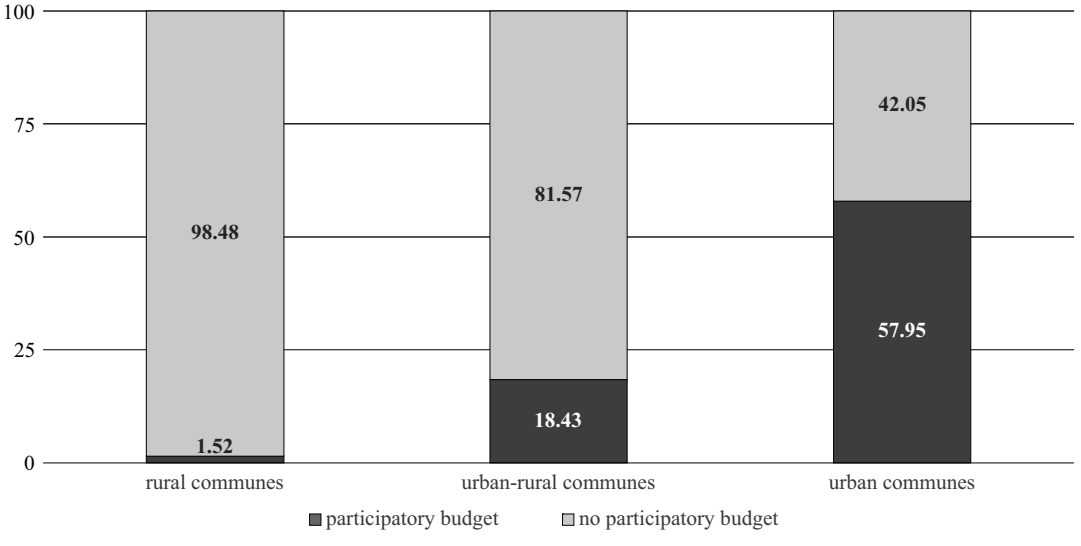

Figure 2. The share of communes that planned a participatory budget in 2022 according to the type of commune criterion [%]

Source: Own elaboration based on GUS BDL.

Considering the criterion of the type of commune, in the years 2020–2022, the share of communes planning a participatory budget in Poland was 12.27% of communes in 2020, 11.18% of communes in 2021, and 12.92% of communes in 2022. The smaller number of communes with a planned participatory budget in 2021 could result from the COVID-19 pandemic ongoing since 2020 and recommendations related to limiting interpersonal contacts. In 2022, approximately 57.95% of urban communes had the planned amount of the participatory budget, although if cities with county rights were excluded from this group (the legislator imposed the obligation to prepare a participatory budget), this share would amount to approximately 46.61% of urban communes. Among urban-rural communes, it was approximately 18.43% of them, and among rural communes – only approximately 1.52% of them. This does not mean that these groups of communes do not engage residents in consulting projects aimed at improving their living conditions, because the legislator provides them with the opportunity to create a village fund and it is created by over half of the communes in which there are villages.

By conducting an in-depth analysis of the average amount of the participatory budget in a given type of commune, its highest value was observed for the group of urban communes, which is related to the large population and high budget of these units (Figure 3). The average amount of participatory budget is much lower for urban-rural communes and rural communes.

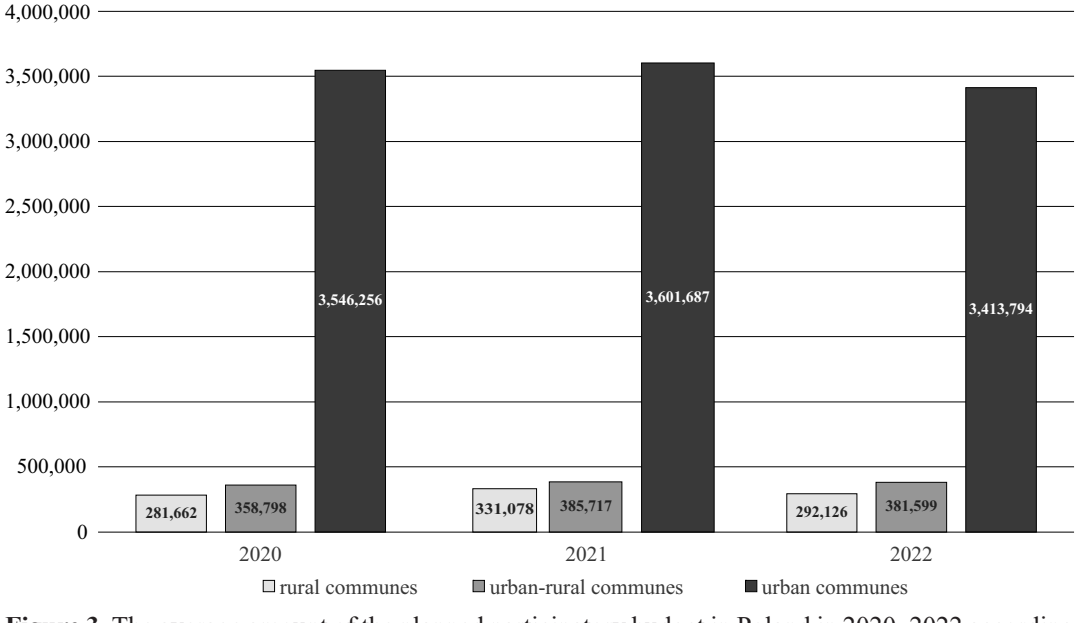

Figure 3. The average amount of the planned participatory budget in Poland in 2020–2022 according to the type of commune [PLN]

Source: Own elaboration based on GUS BDL.

It is cognitively interesting to determine the amount of planned participatory budget per capita. In the years 2020–2022, the highest value of participatory budget per capita was in urban communes, followed by rural and urban-rural communes (Figure 4). If a group of cities with county rights were separated, the average value of the planned budget per capita in these cities in the analysed period would be 39.27 PLN, 39.60 PLN, and 42.87 PLN, respectively.

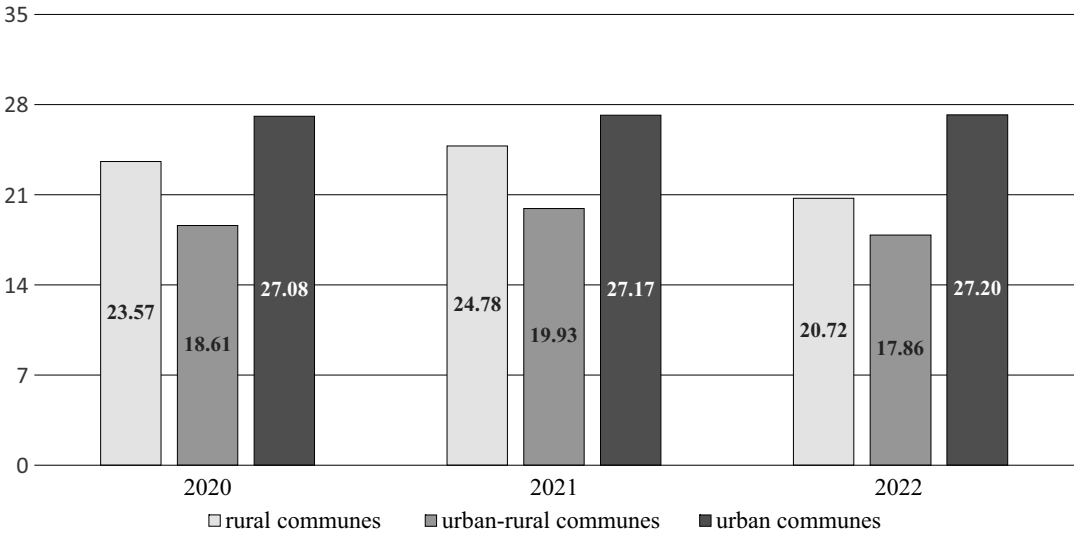

Figure 4. The average amount of the planned participatory budget per capita in Poland in 2020–2022 according to the type of commune [PLN]

Source: Own elaboration based on GUS BDL.

In order to verify whether planning participatory budget depends on the type of commune, the independence test χ^2 was used. Contingency tables were built for the analysed variables (Table 4), which shows the actual number of observations in each combination of variables.

Table 4. Contingency tables with the numbers of communes that planned a participatory budget by type in 2020–2022

communes	2020				2021				2022			
	Participatory budget (PB)		Total	Share of PB	Participatory budget (PB)		Total	Share of PB	Participatory budget (PB)		Total	Share of PB
	no	yes			no	yes			no	yes		
urban	141	95	236	40%	150	86	236	36%	126	110	236	47%
rural	1514	19	1533	1%	1501	22	1523	1%	1490	23	1513	2%
urban-rural	518	124	642	19%	548	104	652	16%	540	122	662	18%
total	2173	238	2411	10%	2199	212	2411	9%	2156	255	2411	11%
Share	90.1%	9.9%	100%		91.2%	8.8%	100%		89.4%	10.6%	100%	

Source: Own elaboration based on GUS BDL.

The following research hypothesis was formulated:
H_1: There is an association between planning a participatory budget by communes and their type.

Based on the chi-square independence test, it is concluded that there is a relationship between planning participatory budget by communes and the type of commune. The value of Pearson's

χ^2 statistics is 4437.6003 in 2020, 369.1400 in 2021, and 498.3568 in 2022 at $p < 0.05$, so there are grounds to reject the null hypothesis. This means that planning a participatory budget is connected with the type of commune in each analysed year. The p-value is the probability of obtaining a chi-square statistic value equal to – or greater than – the calculated value, assuming that the null hypothesis is true. A low p-value (below 0.05) suggests that we can reject the null hypothesis of the independence of variables. The Fi coefficient and Cramer's V coefficient indicate that the relationship is moderate.

Based on the χ^2 independence test, the null hypothesis about the lack of a relationship between planning the participatory budget and the type of commune was rejected. There is an association between planning a participatory budget by communes and their type.

Conclusions and future recommendations

Participatory budget combines two issues. Generally, a budget concerns a plan, a statement of income, and expenses for a future period. In relation to a local government unit (commune, county, voivodeship), the budget is an annual plan of income and expenses as well as revenues and expenditures of this unit, adopted by its decision-making body. In turn, participatory budget includes funds that the local government unit allocates to the implementation of tasks indicated by those residents who are entitled to vote. As a tool, PB provides residents with the right to vote and co-decide on the selection of tasks that are considered particularly important to them and possible to implement in a given period. At the first stage of the PB, applications for initiatives are collected from the residents and, after formal verification of the applications, they are put to a vote at the next stage. This means that participation in this case refers to submitting ideas for spending a separate part of the funds from the commune budget and, through voting, to co-deciding on implemented projects, which, in turn, may affect important issues for the quality of their life and well-being.

In 2018, 93% of Polish residents aged 16 and over felt connected to their place of residence (people very strongly connected or rather connected). The vast majority was satisfied (including very satisfied) with the place of residence (80%). The Cohesion Survey Report shows that 56% of Poles trust local authorities (more or less), 29% do not trust them, and 15% have no opinion (Jakość życia i kapitał społeczny w Polsce, 2020). This may explain why the results of commitment to PB and the impact of implemented ideas are not always fulfilled with the same degree of success (Lehtonen, 2022). The added value in the PB implementation process is generated in the form of social capital understood as a network of interpersonal (but also inter-organisational) connections resulting from a sense of community-based shared norms, values, and beliefs. That sense facilitates cooperation within a given community or between individuals or communities in the implementation of ideas creating common goods. If the level of social capital measured by means of trust towards local authorities differs in communes (also trust among members of the community), also the attitude and behaviour of the inhabitants towards PB may differ. In countries with any tradition of joint decision-making, people are used to a hierarchy of power and a top-down decision-making system. It becomes more difficult to attract the residents to participate in co-creating the local environment by co-deciding on how to spend funds. This results, among others, from limited trust and a sense of lack of influence and agency over what happens in the neighbourhood. Wampler et al. (2021) stated that the results of PB can vary significantly depending on factors such as the political context, the intentions and power of the actors, the existence of a deliberative culture

and vibrant neighbourhood associations, the available resources, the quality of the process, and local government control over tax revenues and policy areas (Schugurensky & Mook, 2024). The implementation of PB without sufficient conviction and commitment of stakeholders, especially representatives of local authorities, generates the risk of losing its original goals and attractiveness, and being discontinued. Differences between voivodeships and smaller communes can result from the number of inhabitants, the number of enterprises, the level of investments, access to EU grants improving the quality of life and reducing differences, and other factors. Also, the effectiveness of PB practice depends upon the historical and cultural context in which the governance system is embedded. Considering the Polish history, social differences between regions still exist.

Another issue refers to the attitude of citizens and local managers towards PB. Those citizens who are not familiar with PB, do not have positive experiences with such initiatives and do not know any successful examples, tend to be averse and keep distance from the new practice. Another issue that arises is connected with the local strategy and regularly implemented tasks according to budget timeline. It may be difficult for local managers to connect PB to other policies, programmes, and initiatives, as well as to avoid potential duplication of efforts and financial spendings. Participatory budget as a tool of the dissemination of the budget produces administrative burdens by delaying decision-making or increasing additional administrative costs (Oh et al., 2019).

Due to the fact that communes differ also internally – e.g. in terms of the population size – it is recommended that a similar analysis be conducted by applying deeper exploration inside of each type of commune. This may broaden the awareness of stakeholders and rulers about the implementation of the participatory budget tool in Poland, its mutual benefits, and the direction of future development.

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The Level of Financing the Higher Education and Science Sector from Public Funds in Poland

Abstract

Objectives: The aim of the article is to verify the hypothesis that the funding level of the Polish higher education sector is disproportionate in relation to the country's economic development, despite the reform considering changes in the mechanisms for determining and classifying financial resources for public universities from the state budget. The paper fills the research gap concerning the scarcity of publications analysing sector financing trends and the impact of the changed funding algorithm on universities' financial situations. It provides an in-depth analysis of the effects before and after the reform as well as explores the implications for the financial stability of educational institutions in Poland.

Research Design & Methods: This article conducts an analysis based on statistical data regarding the financial status of higher education institutions juxtaposed with the country's economic condition. Parameters and legal aspects governing the indexation of public funds for university operations were gathered and explicated utilising laws, assumptions, and resources from Polish and international institutions.

Findings: The research demonstrates that while revenues from universities' operational activities are ostensibly increasing, their real value, adjusted for inflation, has consistently lagged significantly behind the economic growth rate since 2016. Concurrently, the minimum wage level is progressively rising, substantially augmenting the expenses borne by universities. Additionally, the indexation mechanism for financing the higher education and scientific sector via public funds fails to ensure revenue stability amidst disparities between forecasted and actual indicators. In the context of the country's economic progression, the financial status of Polish universities is markedly declining, partly due to the limited diversification of their revenue sources.

Implications / Recommendations: The necessity to augment public funds for higher education and science is underscored to ameliorate institutional financial health while rigorously assessing their effective and judicious utilisation. The mechanism governing budgetary fund indexation should consider unconventional solutions capable of addressing abrupt impoverishment within the higher education sector.

Contribution / Value Added: This article contributes to the ongoing discourse surrounding the financial state of the higher education and scientific sector by furnishing substantial evidence of insufficient funding in relation to Poland's dynamic economic progress. It serves as preliminary material for identifying and implementing corrective and pre-emptive measures to mitigate future adverse consequences.

Keywords: higher education funding, Polish universities financing, universities budget, educational finance reform, funding algorithm changes, financial stability of universities, state budget allocation for universities

Article classification: research article

JEL classification: E62, H41, H61, H83, I22, I23, I28

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Introduction

Five years after the implementation of the provisions of the Higher Education and Science Act and the new funding algorithm for entities operating in the sector, voices from the academic community increasingly highlight the insufficient level of financing for higher education in Poland. Criticisms and raised demands do not concern isolated cases that could be explained by individual financial situations, but, rather, draw attention to the low and unattractive remunerations in the current market realities, which contribute to the issue of a low intergenerational turnover rate of academic staff. Furthermore, there is a lack of resources allocated for ensuring access to educational materials, infrastructure, and performing administrative tasks (KRASP, 2022; RGNiSW, 2021). The identified problems and challenges facing the sector prompt considerations about ongoing systemic changes within universities and the long-term consequences of neglect for the economy and society.

Numerous studies have been dedicated to the topic of financing Poland's higher education sector (e.g. Banyś, 2019, 2021; Górniak, 2015; Kwiek, 2010; Wilkin, 2015). However, there is a noticeable lack of recent publications that provide a detailed analysis of specific financial challenges faced by Polish universities in the light of the 2018 sector reform and the altered economic realities. Previous studies had not explored the currently evident implications of changes in the public funding algorithm, nor had they examined the macroeconomic conditions under which universities now operate. This study aims to assess the current financial situation of the higher education sector in relation to the country's economic conditions as well as to verify the hypothesis that the current funding level may be insufficient in relation to the economic conditions in Poland. The research utilises regulations framing the financial management of universities, data concerning the financing of the Polish higher education and scientific sector, as well as macroeconomic indicators and values subjected to synthetic and comparative analysis. The conducted research aims to answer the following questions: (i) How is the structure of revenues and operational costs of universities changing? (ii) How effective are the mechanisms of public fund indexing in ensuring the financial stability of higher education institutions? (iii) How does the trend in universities' operating revenues align with the country's key macroeconomic indicators such as GDP growth, inflation rate, and wage levels?

Literature review

One of the key determinants of national and regional economic development is the level of social education (Batabyal & Nijkamp, 2013; Romer, 1990). Scientific studies within the economics of education demonstrate that countries with developed higher education systems and higher investments in research and development have greater potential for faster growth in a knowledge-based globalised economy (Agasisti & Bertoletti, 2022; Varghese, 2013). Research institutions, possessing the potential to generate technologically- and conceptually-innovative solutions, play a significant role in reconstructing economies after periods of market crises, thereby enhancing societies' economic resilience to market fluctuations (Times Higher Education, 2020). The prolonged process of educating highly-qualified personnel with higher levels of education is associated with increased competitiveness in the labour market, contributing to reducing unemployment (Núñez & Livanos, 2010). Additionally, investments in developing innovative solutions translate into enhanced productivity (Duran, 1987; Karatas, 2009; Rodríguez-Pose & Crescenzi, 2008). These

aspects, aimed at supporting the country's economic development and enhancing the population's qualifications (Brzezicki, 2019), align with both the strategic goals of the state and the mission of universities. This constitutes a crucial starting point for considerations regarding the long-term social return on invested public funds in the science and higher education sector (Birdsall, 1996; Goksu & Gungor Goksu, 2015) in the literature. Opposing views are also presented in the literature, referring to neoliberalism (Neave, 1992), advocating for increased marketisation of universities (Antonowicz, 2016), and limiting public funding. According to these propositions, the management model and financial economy of higher education institutions should mirror those utilised in private enterprises (Dąbrowa-Szefler, 1995).

As a result of the 2018 higher education reform, the previous multi-stream funding mechanism for universities was replaced by a collective subsidy from the state budget. Its allocation is tied to legally-specified goals pursued by academic institutions (MNiSW, 2019). The obligation to designate the volume of funds for individual university tasks (as defined in Article 94 of the Act of 27 July 2005 on Higher Education) was transferred from the central level to the authorities of individual units, allowing discretionary decision-making regarding the allocation across various areas of university activities. This change, ensuring autonomy in spending commensurate with individual needs (NIK, 2020), drew from the tenets of the New Public Management paradigm, advocating that funding should be linked to the effective utilisation of resources (Szczurowski & Rekuć, 2017). Effective financial management combined with long-term and consistent investment of state budget resources into research and higher education guarantees institutions the assurance of their financial stability (Stachowiak-Kudła & Kudła, 2017). Further support in achieving this goal comes from the application of mechanisms for indexing public funding, long-term planning, and the diversification of university revenue sources (Kalinowski, 2012). Ensuring financial security should form the basis for sustainable development, focusing on seeking efficient and innovative solutions in both long-term research and day-to-day institutional activities (Di Carlo et al., 2019; Estermann & Claeys-Kulik, 2013). Insufficient public funding for universities compels these institutions to seek funds in the private sector by:

- intensifying collaboration with business;
- increasing the commercialisation of scientific activities;
- privatising various aspects of academic life;
- raising tuition fees.

Worth emphasising is the fact that the effectiveness of obtaining funds from private entities depends on the alignment of goals and missions between both parties (Hamilton & Nielsen, 2021). On the one hand, the limitation of public funding may serve as an additional incentive for universities to engage in partnerships with socioeconomic environments. On the other hand, it restricts access to education and the allocation of funds for innovations – issues beyond the primary functions of the institutions (salaries, infrastructure provision).

Public funds remain the primary source of operational revenue for Polish universities (Kwiek et al., 2016). Therefore, budgetary assumptions constitute a crucial element determining the continuity and stability of higher education and scientific institutions. While expenditure planning typically occurs on an annual basis, the formulation of budget assumptions takes into account guidelines established in the "Multi-Year State Financial Plan" and the directions outlined in the updated convergence programme (Owsiak, 2013). Reference to these strategic documents plays a pivotal role in achieving the state's long-term tasks and objectives. As indicated in these documents, the implementation of tasks in higher education and science aims to enhance

the competitiveness of the Polish economy. Additionally, one of the objectives includes elevating the level of scientific research outcomes and fostering collaboration between academia and business, advancing the development of innovative companies (Council of Ministers, 2018–2024).

Research methodology

The research utilised statistical data sourced from the Main Statistical Office in Poland (GUS, 2019, 2024a, 2024b, 2024c) and Eurostat (2024), including GDP, inflation rates, average and minimum salaries in the economy, the minimum basic wage of a full professor, operational revenues and costs of universities, and public expenditure on the higher education sector. Financial aspects were drawn from budget assumptions prepared by the Ministry of Finance, budgets for the years 2014–2025, and budget execution analyses. The rationale for focusing on financial resources from the state budget stems from the fact that it constitutes the primary source of operational revenue for the higher education sector in Poland. Legal frameworks associated with the financial management of the science and higher education sector were defined based on the Act of 27 July 2005 on Higher Education Law, and the Act of 20 July 2018 on Higher Education and Science Law.

The amassed research material underwent analysis to assess the adequacy of the provided funding level to country's economic conditions within the higher education system, considering historical and forecasted economic realities. *Post facto* analysis was applied to the existing structure of revenues and operational costs of higher education institutions in Poland, i.e. financial categories used in planning and reporting documents. Subsequently, the level of state budget expenditures on higher education was verified and evaluated concerning observed legislative changes during the reform period. The analysis outcomes were contextualised within a macroeconomic framework by indexing wages increments and operational revenues, significant for the higher education sector, with an inflation index. The conclusion segment of the analysis involved evaluating the effectiveness of the existing mechanisms in indexing the number of subsidies granted to universities. The analysis serves as the basis for evaluating the current and projected financial situation of the Polish higher education sector in relation to the country's economic circumstances.

Results and discussion

With a low degree of revenue source diversification, higher education institutions are reliant on decisions made by the main funders: the government and households. University authorities have tools at their disposal to influence the level of revenues and costs, securing the institution's financial stability. For instance, they can modify the number of students in subsequent admissions while considering financial mechanisms embedded in the subsidy allocation algorithm. They can also adjust the range of study programmes, apply for grants to conduct scientific research, contingent upon legal constraints, university strategies, socioeconomic conditions, and demographic situations.

The analysis of operational revenues obtained by universities from 2014 to 2023 leads to the conclusion of a consistent trend of their nominal increase; however, it is not a reliable indicator for assessing potential improvements in the actual financial situation. Notably, modifications in financial streams from public funds result in discrepancies in presenting the extent of financing for both educational and research activities during the periods governed by two legal frameworks. The values of subsidies granted from 2019 to 2023 should be compared with the cumulative

value of state budget allocations for educational, statutory activities, and a portion categorised as other revenues from 2014 to 2018. This comparison aims to significantly diminish the disparity between subsidy amounts and grants, which will be reflected in Figure 1.

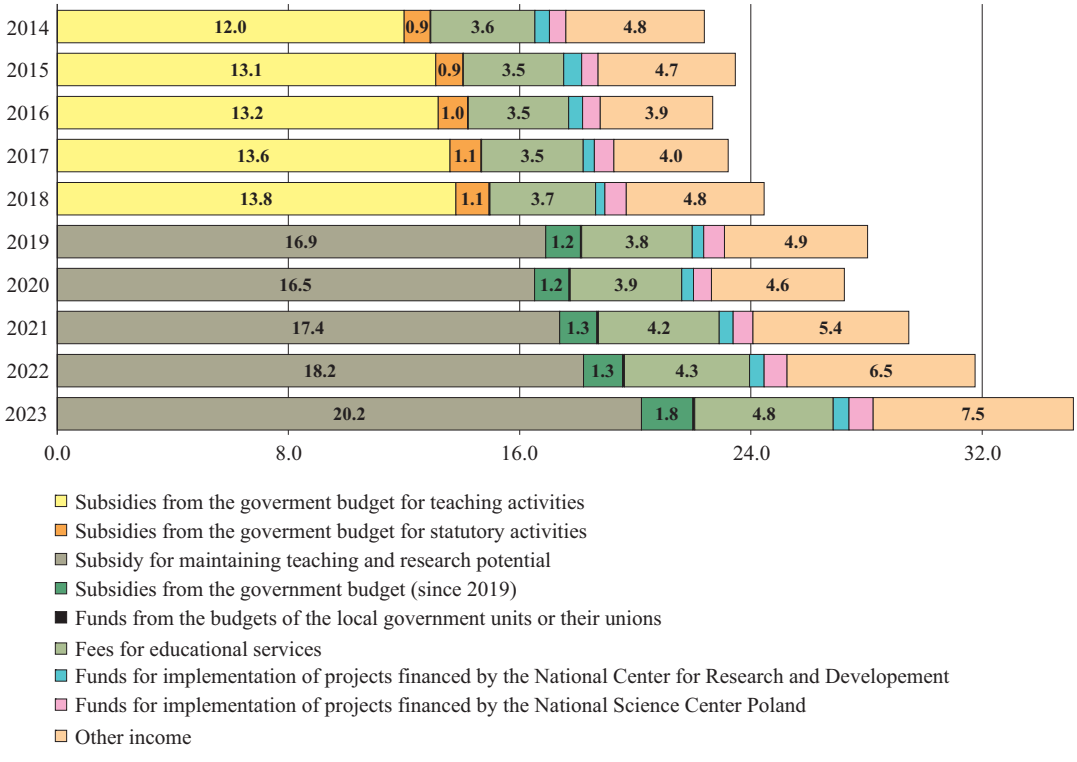

Figure 1. Revenues from the university's core operating activities in 2014–2023 [in bn PLN]

Source: Own study based on GUS, Higher Education and its finances, and Higher Education Institutions and their finances.

Another significant element is the trend line of operating revenues derived from fees for educational services. Despite steady nominal growth since 2017, culminating in a record high of 4.8 billion PLN in 2023, the share of operating revenues derived from fees for educational services has been on a downward trajectory, declining from 16.1% to 13.4% over the analysed period. A structural analysis inference also indicates that private funding remains a marginal portion of the funds acquired by educational institutions compared to at least 60–69% (from 2019 to 2023: approximately 66–69%) sourced from the state budget and other public entities. Conclusions drawn from the analysis contained in Figure 1 also demonstrate an increase in funding for projects financed by the National Centre for Research and Development as well as the National Science Centre Poland, supporting the execution of specific research endeavours.

Personnel costs, including wages, social security contributions, and employee benefits, constitute the most significant operational expense category incurred by universities, accounting for approximately 70% of total expenditures. The most significant increase in university staff wage costs occurred in 2023, with a year-on-year rise of 12.5%. A comparable surge was last observed in 2019, when costs grew by 11.4%. Particularly in recent years, geopolitical

realities have significantly impacted the overall operational costs. The year 2020, due to the COVID-19 pandemic, witnessed a shift of university activities into the virtual realm, resulting in an unchanged or even reduced cost in material consumption, energy, and external services compared to the previous year. Remote operations persisted for a significant part of 2021 (MEiN, 2021), limiting costs related to material and energy consumption. Consequently, in 2022, amid a dynamic inflation surge, these costs saw a record-breaking 22% increase, followed by a further 19% rise in 2023.

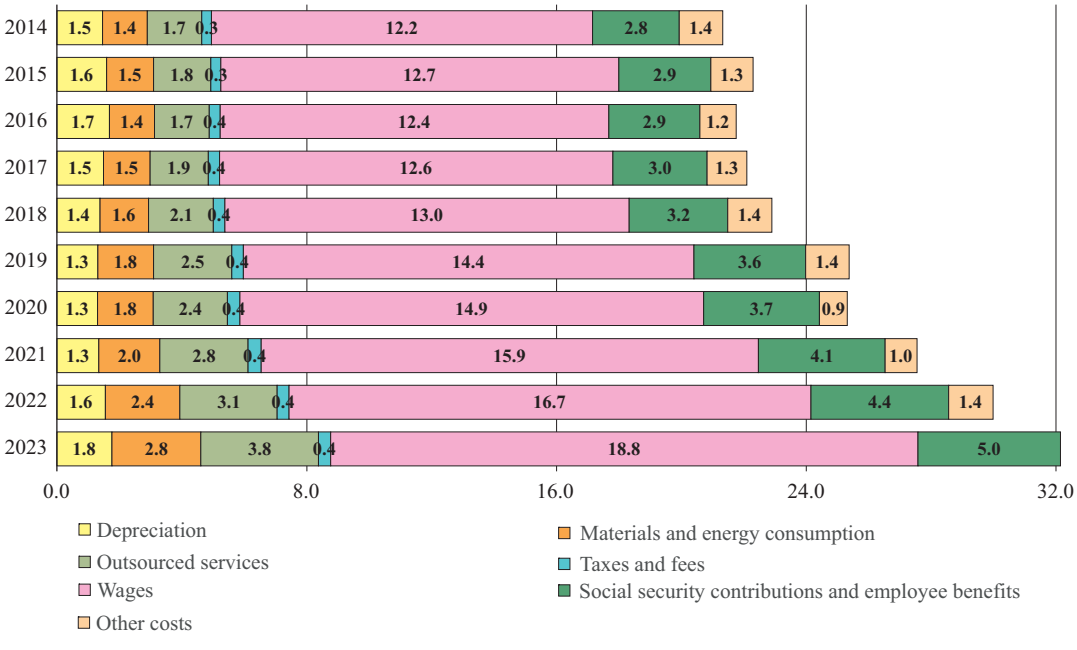

Figure 2. Detailed breakdown of operational expenses of the university by categories from 2014 to 2023 [in bn PLN]

Source: Own study based on GUS, Higher Education and its finances, and Higher Education Institutions and their finances.

The coverage ratio of operating costs by subsidies for maintaining educational and research potential is decreasing: it stood at 66% in 2019 and was 7 percentage points lower in 2023. Difficulties in estimating the impact of this trend on the financial situation of the university arise due to the lack of clear analysis of cash flows between the acquired subsidy and the expenses covered by it, such as wages of employees engaged in teaching activities for full-time and postgraduate studies (both basic and commercial activities). Notably, a significant change for the sector – the decline in the number of students (GUS, 2019, 2024c) driven by changes in the funding algorithm – has not significantly impacted cost reductions.

The coverage ratio of operating costs by fees for educational services remains relatively stable at 14–15%, while the weight of other revenues is increasing, with the ratio reaching nearly 22% in the last year, approximately 3.5 percentage points higher than three years earlier. This category includes revenues from room rentals, separate business activities, long-term investments, and dedicated funds. Consequently, there has been an increase in the potential to generate revenue from commercial and investment activities.

The data presented in Figure 3 reflects the actual level of budgetary expenditures for section of the budget 803 "Higher Education" from 2014 to 2018, whereas from 2019 onwards, it pertains to budget heading 730 "Higher Education and Science." Apart from the enactment of the new Higher Education and Science Act at the end of 2018, which altered the streams and funding algorithms for higher education institutions from public funds, there was also a change in the budgetary classification of expenditures for higher education and science in 2019. This merger combined section of the budget 730 "Science" and 803 "Higher Education" into a new singular category 730 "Higher Education and Science."

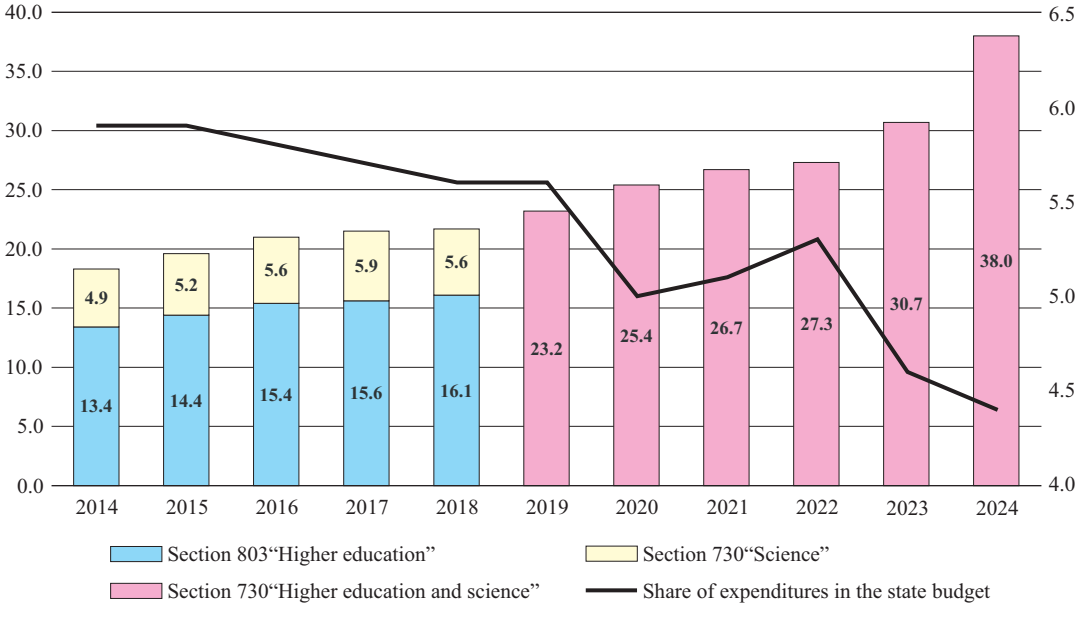

Figure 3. Public expenditures from the state budget on science and higher education and their share in the state budget from 2014 to 2024 [in bn PLN, %]

Source: Own study based on budget acts for 2014–2024.

The growth rate of public expenditures in the sector exhibited a downward trend during the period of previous budget classification, declining from 8.5% to 0.9% in subsequent years. However, since 2019, expenditure growth has fluctuated between 2.2% and 9.6%. Notably, in 2023 and 2024, state budget allocations for the higher education and science sector increased significantly by 12.6% and 23.5%, respectively. Over the past decade, the share of state budget expenditures allocated to higher education and science has declined by 1.53 percentage points, reaching 4.38% in 2024. Despite the sector's reform involving modifications in the classification of state budget expenditures since 2015, the share of funds allocated to higher education and scientific institutions from the state budget has significantly decreased.

To assess the adequacy of university financing and the current as well as projected situations of academic institutions, the author conducted a comparative analysis of the growth rate of operational revenues concerning GDP, minimum and average wages in the economy, as well as the minimum basic salary of a full professor. This analysis considered the average annual inflation values from 2014 to 2023, setting the year 2014 as the reference point (100%). Based

on the National Bank of Poland's July 2024 projections, an inflation rate of 6.6% for the year 2024 was adopted, along with a GDP growth rate of 3.0% in 2024 (average values of the most probable ranges) (NBP, 2024). Additionally, the assumption was made that operational revenues of universities would increase by the same percentage between 2024 and 2025 as expenditures from the state budget on higher education and science.

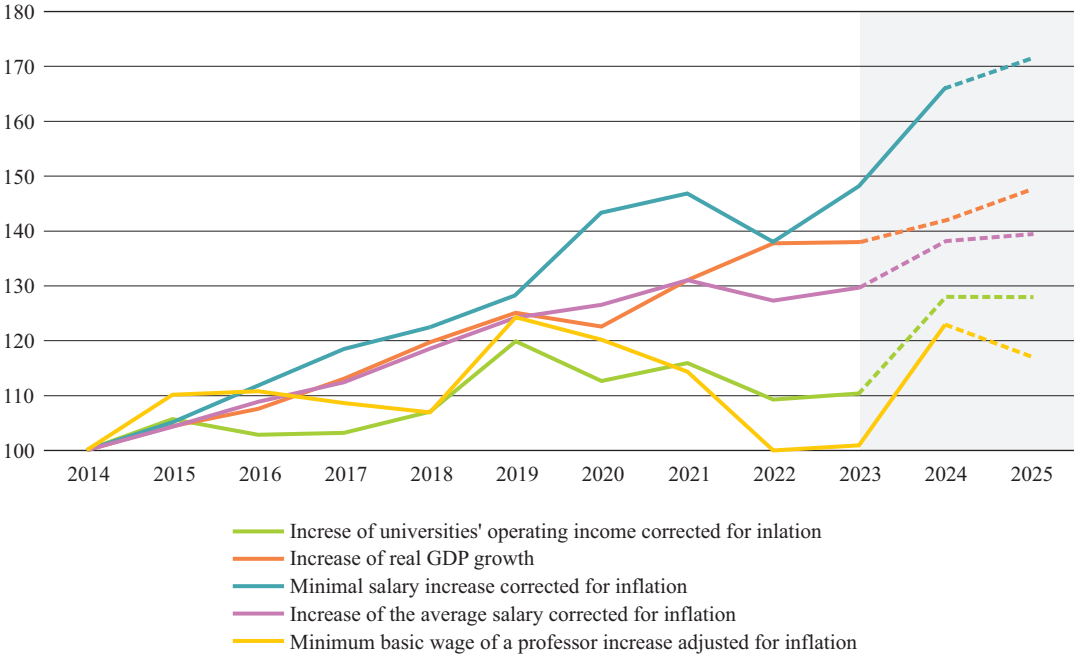

Figure 4. Analysis of the relative growth of university operational revenues adjusted for inflation compared to the growth of GDP, minimum and average salary in the economy, minimum basic wage of a professor from 2014–2025, along with projections for 2024 and 2025 (2014 = 100%)

Source: Own study based on GUS, Average Employment, and Gross Monthly Earnings data, Council of Ministers Regulation on the Minimum Wage and Hourly Rate, Eurostat and NBP projections of GDP and inflation.

All types of remunerations displayed periodic valorisation relative to inflation, shaped by market realities or legislative changes in the case of minimum wages. Until 2021, the increase in the average level of wages in the economy generally corresponded to the pace of economic growth, aligning with the dynamics of national development. However, the level of the minimum wage in Poland exceeded the pace of the country's economic growth, significantly impacting the higher education and scientific sector in terms of wage costs, primarily for administrative staff. The rise in the minimum wage for a full professor proportionally affects the salaries of academic staff with lower academic ranks and scholarships awarded to doctoral students (Act of 20 July 2018 on Law on Higher Education and Science). As of 2023, it increased from 6,410 PLN to 7,210 PLN (Regulation of the Minister of Education and Science of January 2, 2023, amending the regulation on the minimum monthly basic salary for a professor at a public university), and reached 9,370 PLN in 2024 (RGNiSW, 2023). The decisions by the Minister of Education and Science partially compensate for the current economic situation and the period of declining

attractiveness of wages in the sector since 2019 in relation to market realities. However, when assessing the financial situation of employees in the higher education and scientific sector, it is important to consider that basic wages are just one of many possible ways of earning income (functional bonuses, civil-law contracts) (Sekuła, 2021). While the rise in salaries may enhance the sector's competitiveness in relation to market rates, it will undoubtedly impact the cost structure of universities, where personnel costs form the largest portion, thereby limiting the possibility of allocating funds for other university activities.

A pessimistic outlook emerges from the comparison of the growth in operational revenues of universities with Poland's GDP growth. In 2016, there was a decrease in the growth rate of revenues by about 3 percentage points compared to the previous year, marking the first year of higher economic growth compared to the operational revenues of universities indexed by inflation. Since then, their growth rate has remained significantly below the pace of economic growth. For the following three years, operational revenues, adjusted for inflation, grew at a rate of approximately 1.0–6.4% annually. However, starting in 2019, which was the first year of the new sector financing mechanism, a period of successive decline in the growth of operational revenues of universities commenced. Their trajectory presents an opposite direction to the rising GDP of the country.

The total amount of planned expenditures from the state budget allocated for financing universities in subsequent years underwent valorisation based on the average annual consumer price index and, concerning salaries, on the average annual growth rate of salaries in the state budget sphere (Act 2005, Article 93). These regulations theoretically guaranteed the valorisation of funds allocated to the sector in response to the relatively current economic situation of the country. However, in practice, this mechanism refers to the values used to develop the annual state budget expenditure plan within the framework of the budget act. Consequently, the valorisation parameters could correspond to 0% of the value, as confirmed by the data included in Table 1.

Table 1. Projected and actual values of the goods and services price index, as well as the average annual wage growth rate in the state budget sector for the years 2009–2018

Year	CPI (YoY)			Average annual wage growth rate in the state budget sphere (as per budget acts)
	Forecast	Actual	Diff	
2009	2.9%	3.5%	+0.6	3.9%
2010	1.0%	2.6%	+1.6	1.0%
2011	2.3%	4.3%	+2.0	0.0%
2012	2.8%	3.7%	+0.9	0.0%
2013	2.7%	0.9%	–1.8	0.0%
2014	2.4%	0.0%	–2.4	0.0%
2015	1.2%	–0.9%	–2.1	0.0%
2016	1.7%	–0.6%	–2.3	0.0%
2017	1.3%	2.0%	+0.7	0.0%
2018	2.3%	1.6%	–0.7	0.0%

Source: Own study based on budget acts for 2009–2018 and data from the Central Statistical Office.

The average annual salary growth rate in the state budget sphere, as established in the budget acts and defined as the year-on-year salary increase, remained at 0.0% for eight consecutive years. Consequently, from 2011 to 2018, the government did not plan any salaries valorisation for state budget employees. Over a span of ten years, the valorisation of the funds designated for salaries averaged 0.49% annually, which is significantly lower than the inflation rate of 1.71% (projection: 2.05%). A notable discrepancy is evident between the projected and realised values of the goods and services price index – averaging 1.5 percentage points annually during the period of ten years. The average annual values of this variable, as defined in the budget act, carry an evident predictive error arising from the macroeconomic environment's variability. However, the values set by the legislator between 2010 and 2016 significantly deviated from reality. From the economic benefit perspective, this discrepancy could have favoured the sector during periods of real deflation, since the projected valorisation was based on positive index values. The mechanism did not guarantee an increase in funds for the science and higher education sector due to discretionary decisions regarding the salary growth index in the state budget sphere, including maintaining a 0% increase for several years and a significant discrepancy between projected and actual inflation values. The valorisation mechanism underwent changes upon the enactment of the 2018 law, which specifies in Article 383 the valorisation of funds in the state budget for financing higher education and science by summing up two parts:

1. In terms of higher education financing, valorisation is based at least on the projected commercial price growth rate as set in the budget act (also applied in the previous mechanism).
2. In terms of science financing, valorisation is grounded on the multiplication of the valorisation index and the projected real GDP growth provided to the Social Dialogue Council based on the Minimum Wage Act.

Table 2. Forecast and Actual Values of the Indices Used for Indexing Funds Allocated for Financing Higher Education and Science from the state budget in years 2019–2025

Year	Higher education financing			Science financing				
	CPI (YoY)			GDP (YoY)			Indexation Rate	Multiplication
	Forecast	Actual	Diff	Forecast	Actual	Diff		
2019	2.3%	2.3%	0.0	3.8%	4.4%	+0.6	1.25	0.048
2020	2.5%	3.4%	+0.9	3.7%	–2.0%	–5.7	1.35	0.050
2021	1.8%	5.1%	+3.3	4.0%	6.8%	+2.8	1.45	0.058
2022	3.3%	14.4%	+11.1	4.3%	5.1%	+0.8	1.55	0.067
2023	9.8%	11.4%	+1.6	3.2%	+0.1%	–3.1	1.65	0.053
2024	6.6%	3.6%	–3.0	3.0%	2.9%	–0.1	1.75	0.053
*2025	5.2%	…	…	3.8%	…	…	1.85	0.070

* Figures not available at the time of publication.

Source: Own study based on assumptions from the state budget project for 2019–2025, state budget acts for 2019–2024 and Eurostat data.

The values communicated to the Social Dialogue Council by June 15 of a given year concerning the projected growth of GDP align with the assumptions for the state budget project. Due to the public availability of this type of document, the data contained within it has been utilised

for the above analysis. The forecast GDP values and inflation for 2025 are based on the July 2024 projection issued by the National Bank of Poland.

The index for the valorisation of science funding from 2020 to 2028 is increasing by 0.1, starting from the baseline value set in 2019 at 1.25. This gradual increase aims to signify a higher priority for the development of this field through the gradual elevation of science funding levels. Additionally, according to Article 383 Section 5, the legislator introduced limitations on reducing the financial resources earmarked in the state budget for financing higher education and science compared to the preceding year. This is crucial for ensuring the financial stability of the sector during economic crises or deflationary conditions.

Table 3. Comparison of Actual Growth and Statutory Assumptions of Minimum Indexing of Expenditures from the state budget for Science and Higher Education in the years 2019–2023

Year	Indexing for Financing Higher Education (min)	Indexing for Science Financing (min)	Indexing range for higher education and science (min)	Actual Growth of Expenditures on Higher Education and Science	Fulfilment of Statutory Indexing Requirement
2019	2.3%	4.8%	2.3–4.8%	6.79%	YES
2020	2.5%	5.0%	2.5–5.0%	9.64%	YES
2021	1.8%	5.8%	1.8–5.8%	5.04%	YES
2022	3.3%	6.7%	3.3–6.7%	2.20%	NO
2023	9.8%	5.3%	5.3–9.8%	12.55%	YES

Source: Own study based on state budget acts for 2019–2023.

The legislation of the act does not specify the exact proportions between the minimum indexing of expenditures for higher education and for science. Therefore, for analytical purposes, a range of minimum indexing was adopted, which must be met when determining the state budget and expenditures in this area. An analysis of Table 3 demonstrates that while this stringency was adhered to in the years 2019–2021 and 2023, the allocations for higher education and science did not fulfil the indexing conditions as designated by the regulations in 2022.

It is crucial to note that anchoring the higher education financing mechanism to the inflation index is sensitive to disparities between projected and realised increases in prices. This sensitivity was particularly evident in 2022, when the average annual index of goods and services remained at a high, double-digit level. The observed differences are substantial, influencing the assessment of the reliability of the data contained in the assumptions for the state budget prepared well in advance in accordance with public finance principles. The mechanism is more suited to economic stability realities and tends to falter when the economy contends with crisis conditions. The legislator did not anticipate a compensatory or protective solution to ensure a relatively steady increase in sector financing relative to rising costs and economic stagnation in the event of significant differences between forecasted values determining the amount of allocated funds and the recorded values of macroeconomic indicators.

Conclusions

For eight years, the real growth rate of university operational revenues in Poland, accounting for the average annual growth of goods and services prices, has consistently remained below the country's economic growth rate. Among them, the most significant is the subsidy for maintaining educational and research capacity, which, although increasing nominally, is failing to keep pace with the country's economic development. Statutory raises in the minimum wage progressively escalate costs for universities, while the simultaneous lack of revenue increases exacerbates financial crises within individual institutions. The existing legal framework lacks a correlational mechanism between the growth of the minimum wage and public fund streams.

Institutions heavily reliant on state budget funding require not only government-provided subsidies but also increased revenue from the business sector. Rational allocation and improving the efficient use of available funds at the institutional level is imperative. Leveraging the statutory autonomy granted to universities for allocating funds to different areas according to current needs should introduce solutions and regulations to limit inefficiency. While revenue from educational services fees and the potential to generate income from commercial and investment activities have increased in recent years, these approaches also have limitations and negative consequences. Excessive tuition fee hikes may create economic barriers to education access, and the rapid growth of revenues from commercialising scientific research, currently at a low level (Łaskowska et al., 2023), necessitates long-term systemic actions.

Since 2015, the share of expenditure on higher education and science from the state budget has decreased despite the 2018 reform and changes in budget classification. The existing mechanisms that index the amount of public funds allocated to the sector exhibit significant shortcomings during economic crises when projected values of macroeconomic variables do not align with reality. Doubts also arise regarding the application of a minimum level of budget indexation for the science and higher education sector under the state budget. Assuming that the state's policy goals remain focused on the sector's development and its continued financial commitment to Polish science and higher education, a solution indexing subsidy in response to the relative decline in public expenditure causing financial problems in institutions should be implemented. However, any increase must precede a broader audit of expenditure at the university level and strengthen the existing control mechanisms.

These aspects demonstrate alarming trends in the education and higher education sectors. Polish universities are not developing in line with the country's economic growth. Long-term educational issues may be associated with a gradual loss of the most critical element driving the country's development, namely highly-qualified workforce and scientific expertise equipped with market-attractive competencies and useful in a rapidly changing environment. Failure to take action in order to improve the financial condition of higher education and scientific institutions may deepen the negative trends in this sector and in the entire country.

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Patryk Gębica

Location-Based Games as a Form of City Promotion: The Case Study of Pokémon GO and the Cracow Old Town

Abstract

Objective: Location-based games have been very popular for years, and the links they contain to places in the real world may raise questions about the quality of the content presented. The aim of the article is to present the possibilities of location-based games in the promotion of cities, using the example of the Pokémon GO game in the Old Town area of Cracow.

Research Design & Methods: The research article is based on a literature review and content analysis of the Pokémon GO game in the Old Town of Cracow. As part of the study, players were asked to rate the portals in the mentioned game in the study area.

Findings: There are over 250 portals of various characteristics in the Old Town of Cracow. Most of them, according to the respondents, are of high value and allow one to get to know the city better by playing Pokémon GO.

Implications / Recommendations: This study may be important for city authorities who would like to better promote their areas that are often visited by players.

Contribution / Value Added: The quality of POIs in the Old Town area of Cracow is quite high. The portals around the Wawel Royal Castle were particularly highly rated. Moreover, in the opinion of the respondents, portals presenting information boards and commemorative plaques are the most carefully prepared.

Keywords: tourism, location-based games, city promotion

Article classification: research article

JEL classification: L830

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Introduction

Pokémon GO as a location-based game

Location-based games are a relatively young genre of games that involve adapting content to the user's location. They began to appear at the beginning of the 21st century, and the game *Botfighters* (2000) is considered one of the pioneers of this genre (de Souza a Silva, 2009). The greatest development of location-based games began in 2016. That is when the *Pokémon GO* game debuted. Undoubtedly, an important factor resulting in the creation of location-based games was technological development, particularly the development of geolocation technologies. Owing to it, digital fun could be transferred to the real world, which opened new opportunities for players and creators (Nicklas et al., 2001).

By definition, location-based games are programmes and applications that use geolocation technologies, usually through the GPS module, although they may, depending on the need, use other sets of satellites such as GLONASS or Galileo. By determining the player's location, they provide access to information such as terrain, weather, etc., based on which gameplay elements are created. These types of programmes are characterised by high requirements regarding connectivity, which is why they are usually released for smartphones (Weber, 2016).

However, the above-mentioned aspects are not the only factors that distinguish location-based games from games in the classical sense. Progressing in location-based games is not possible without moving around, because players are rewarded for, for example, kilometres travelled, visiting a specific country or city, or even staying in a given place long enough. A common complaint about classic games was the amount of time that the users spent sitting in front of the screen or monitor. Location-based games require real-world movement, which can impact physical health. Moreover, they open up opportunities to improve mental health by spending time with people with similar interests and making new friends (Wang, 2021). This innovative approach to the seemingly closed and tight gaming market has contributed to the dynamic development of location-based games and the creation of new titles.

Location-based games use the POI (Points of Interest) system. It is popular in applications and programmes based on the user's location, in which it is used to recommend, for example, restaurants or museums. Examples include the Yelp and Foursquare applications, which, by recording users' whereabouts, are able to analyse previous behaviour and, based on it, suggest visiting subsequent, similar destinations (Qin et al., 2018).

The POI system is one of the main reference points for the player on the virtual map. Points of interest in the real world are reflected in the mobile world, owing to which the player can better familiarise themselves with the area where they spend free time. This system, of course, has its drawbacks, and they are especially felt by players in rural areas, because there are not so many interesting points there, and, as a result, the game offers a much less dynamic experience than, for example, in the city centre (Laato et al., 2021).

The most popular location-based games include: *Pokémon GO*, *Ingress Prime*, *Geocaching*, *Pikmin Bloom*, *Monster Hunters Now*, as well as games already withdrawn, such as *Harry Potter: Wizards Unite* and *The Witcher: Monster Slayer*. Due to the greatest popularity of the first of the mentioned games, this article will concern specifically it.

Games featuring Pokémon first appeared in the 1990s and involved catching, training, and fighting with virtual creatures. Over time, the franchise developed and films, TV series, and

Pokémon cards were created. In 2016, *Pokémon GO* debuted. It is a location-based game that allows players to catch these creatures in different destinations (Ashar et al., 2020). It is one of the most popular location-based games today (Moscoso et al., 2022).

According to data from Google Play (as of May 2024), *Pokémon GO* has over 100 million downloads. Its average rating from 15.5 million reviews is 4.0. Hundreds of thousands of players engage in events around the world. There are over 2,500 such people in Cracow alone (the data comes from the Niantic Campfire application). Moreover, global events organised annually for *Pokémon GO* players attract many fans of this application. In 2023, three GO Fest events were held in Osaka, London, and New York, respectively. Nearly 200,000 people took part in them. According to reports prepared for Niantic, these events generated 323 million USD for local economies (Niantic, 2023).

As already mentioned, in location-based games, the POI system is used for orientation in the field. This system has been effectively expanded in Niantic's games. The first one, *Ingress Prime*, allowed players to submit their own points, which could later be presented in the virtual world after verification. In this way, a POI database was created, from which other titles published by this studio were derived. *Pokémon GO* uses POI in two ways. These portals are called Pokéstops and Gyms in the game. The first ones are the most common and allow players to obtain useful items as well as install Pokémon lures. The second group of locations is much rarer and allows players to fight and take over territory, owing to which they have the opportunity to obtain in-game currency called Pokécoins (Juhász & Hochmair, 2017). This virtual infrastructure uses so-called S2 cells, into which the globe is divided. They have different levels, and from the perspective of *Pokémon GO*, the most important is level 17, because there can be a maximum of one portal in such an area. Therefore, in culturally rich places with a high density of interesting objects, there is often a situation where they do not have a virtual equivalent, because they would violate the rules of portals. The POI database has been gradually developed in recent years, as it became possible to report portals via *Pokémon GO*. The centre of the proposed POI is the Niantic Wayfarer, a website that collects all reports and corrections submitted by the player (Laato & Tregel, 2023).

In *Pokémon GO*, portals have a photo, name, and, above all, location. Moreover, they can be enriched with a description or additional photos. This is important, because users have the opportunity to read this information while playing, which may be an additional attraction for them, for example when travelling (Woods, 2020).

The main tourist attractions of the Cracow's Old Town

Cracow is a particularly important city from the perspective of Polish history, not only as the former capital of the country, but also as a cultural centre. Thousands of tourists are attracted by its architectural beauty, tourist attractions, monuments, and places closely related to history. An area particularly rich in this type of places is the oldest district, the Old Town, whose current shape was formed in the 13th century (Kraków, 2024). Importantly, the Old Town in Cracow was included in the UNESCO World Heritage List in 1978, and in 1994 it was recognised as one of the National Historical Monuments (Golonka-Czajkowska, 2017).

The Old Town in Cracow is an attractive tourist area. The most recognisable historic buildings there include (Triverna, 2023):

- the Cloth Hall – former shopping spaces where one can still buy souvenirs and handicrafts. On the first floor of the building, there is the Gallery of the 19th-century Polish Art. In the basement,

there is an entrance to the Main Square Underground, which is a branch of the Historical Museum of the City of Cracow;
- St. Mary's Basilica, a Gothic temple dedicated to the Assumption of the Blessed Virgin Mary, which houses the famous 15th-century altar of Veit Stoss. Moreover, the bugle call can be heard from St. Mary's Tower every hour;
- the Florian's Gate with the city's defensive walls and the Barbican, the northernmost part of the Old Town fortifications;
- the Wawel Royal Castle, i.e. the residence of the Kings of Poland until the 17th century. It has been a museum since 1930. It is worth adding that it also serves as a mausoleum of kings and distinguished Poles. In addition to the crypts, there is also the Crown Treasury, the Armory, and the Royal Chambers. A crucial element of the identity of this place is the Dragon's Den with the monument of the Wawel Dragon, which refers to a local legend;
- Collegium Maius of the Jagiellonian University, the oldest part of the former Cracow Academy. It was established in the 15th century. Currently, it serves as a museum, where the exhibits refer primarily to the history of the University.

In addition, there are numerous churches and religious buildings, places belonging to universities, richly-decorated tenement houses, sculptures, fountains, and museums. Moreover, the entire area of Cracow's Old Town is surrounded by green areas in the form of the Planty Park.

Location-based games as one of the contemporary forms of city marketing

The concept of place (city) marketing has developed significantly owing to the work of Kotler and Levy in the 1970s, although it had already been known in the 19th century, when cities made various efforts to attract as many tourists as possible. City marketing has undergone a transformation over the years from the introduction of high-intensity advertising tools to the creation of place brands. In order for promotional activities to achieve the intended result, it is extremely important to engage various groups of stakeholders. On the one hand, the active participation of such people strengthens their sense of belonging, owing to which they develop enthusiasm for being the ambassadors of a given place. On the other hand, place branding can cause negative feelings, i.e. hostility or scepticism. Therefore, providing stakeholders with reliable information as well as incorporating their ideas and postulates is an extremely important aspect of city marketing (Khairat & Marso, 2023).

Cities and places must undertake city marketing activities to strengthen and/or increase their competitive position. These strategies concern the assets of a given area, i.e. what it can offer to residents, visitors, tourists, etc. Increasing the attractiveness of a city as a place to do business, live permanently, or simply visit contributes to building its competitive position compared to others (Boisen, 2007).

Nowadays, modern technologies can help build the best possible relationships with stakeholders. Dynamic changes in the environment, globalisation, and the development of mobile applications force decision-makers to redefine the structure of communication tools. On the one hand, these innovative solutions bring the real world closer to recipients, and on the other hand, they enrich it with virtual elements. Modern technologies allow the recipients to access many sources of information provided in real time. What is more, they can voluntarily pass on this message to other interested parties, thereby co-creating these messages. For this reason, mobility, interactivity, and feedback have become the basis of modern marketing communication (Pisula et al., 2023).

The three above-mentioned features are also an important part of location-based games. These games are primarily designed for mobile platforms, because they often require access to the Internet, and their operation is based on geolocation technologies. Location-based games are also interactive in a much broader sense than classic games. Interaction does not only occur between the player and the device, but also the aspect of the environment (place) is added, with which both the user and the game can interact (Weber, 2016). Feedback, on the basis of which changes are made, is also extremely important. It can consist in influencing the decisions of developers, e.g. regarding the introduction of certain improvements or ‚quality of life' updates. On the other hand, location-based games, e.g. *Pokémon GO*, are based on the POI system, which is largely created and rated by players. These objects can significantly contribute to the promotion of individual places (monuments, restaurants), larger areas (city parks, museums), and even entire cities among players (Laato et al., 2021).

Literature review

Previous publications on location-based games refer to various aspects of this phenomenon. A significant part of scientific works discuss technological issues, e.g. relating to the use of AR (augmented reality) technology (Laine, 2018). There are also publications relating to the design and implementation of place-based games (Veloso et al., 2020). When it comes to articles showing the relationship between location-based games and tourism, many of them merely indicate the existence of such a phenomenon (Tussyadiah, 2012). A broader perspective is provided by publications presenting territorially-based games as a form of a destination guide (Paul, 2021).

Publications related to the *Pokémon GO* game cover various issues. Most concern the game's promotion of physical activity (Liu & Lingmann-Zielinska, 2017; Althoff et al., 2016) and psychological aspects (Paasovaara et al., 2017; Lawler-Sagarin et al., 2023). Some articles examine the motivation to play the game (Broom et al., 2019; Marquet et al., 2017) and in-app purchasing behaviour (Senra & Vieira, 2018; Rasche et al., 2017). The authors also deal with game analysis (Sablatura & Karabiyik, 2017) and the issues of learning through playing (Majgaard & Larsen, 2017; Srinivasan et al., 2019). Few articles present various aspects related to *Pokémon GO* from the perspective of specific cities, but these which do are related to Melbourne (Wang et al., 2018) or Rio de Janeiro and Nairobi (Silva et al., 2021; Silva et al., 2023), as well as countries such as Brazil (De Souza-Leao & Moura, 2018) or Peru (Mejia et al., 2019).

Research methodology

The aim of the research was to evaluate POI in the Cracow Old Town based on various criteria. The following research questions were asked:

- RQ1: How do players rate the portals located in Cracow's Old Town?
- RQ2: What types of portals are rated the highest by players?
- RQ3: In which part of the Old Town are the highest-rated portals located?

For the purposes of this article, all *Pokémon GO* portals in two Old Town areas of Cracow were analysed. The study consisted of four parts. The first one was an analysis of the game content in order to identify all Pokéstops and Gyms located in the Old Town area. The second stage was to establish the evaluation criteria and their weights. In addition, all portals were divided into themes. Also, the analysed area was divided into seven smaller parts, and each of them had

a characteristic tourist attraction. The third stage was attended by three *Pokémon GO* players from Cracow, who are at least level 45 in the game and have at least a silver Wayfinder Badge (750 correctly rated portals). They assessed all portals according to the established criteria. The last stage involved analysing the collected data using descriptive statistics. The entire study took place in April and May 2024.

The analysis of the game content showed that there are 255 portals in the examined area, of which 240 are Pokéstops and 15 are Gyms. After distinguishing all POI, questionnaires were prepared for the respondents, in which they were asked to evaluate the portals in terms of four criteria on a scale from 1 to 5. The most important criterion was the location (weight 0.35), because it is a virtual reference point for the player's location. The respondents could rate the location of portals based on the following degrees:

- 1 – Unidentified point.
- 2 – Identified point located outside the Old Town district.
- 3 – Identified point more than 10 metres away.
- 4 – Identified point 3 to 10 metres away.
- 5 – Identified point within 3 metres.

The title criterion (weight 0.3) is also important, because it allows players to identify the nature of the object. The players could rate them based on the following ratings:

- 1 – No title.
- 2 – Incomprehensible title.
- 3 – Understandable but not detailed title.
- 4 – Slightly expanded title containing some key information.
- 5 – Detailed title containing key information.

The third assessed feature of POI was description (weight 0.2). It may provide additional trivia for players and be a source of other useful information. The description of the portals was assessed based on the following criteria:

- 1 – No description.
- 2 – Incomprehensible description.
- 3 – Description same as title.
- 4 – Not very detailed description.
- 5 – Detailed description.

The last assessed feature was the photo (weight 0.15). It allows players to visually identify portals. The following degrees were distinguished:

- 1 – No photo.
- 2 – Blurred photo(s).
- 3 – Exactly 1 clear photo.
- 4 – Exactly 2 clear photos.
- 5 – 3 or more clear photos.

Due to the complexity of the research (the need to evaluate 255 objects according to 4 criteria), three players took part in the study. They had been previously verified in terms of their level in the game (at least 45) and their Wayfinder Badge (at least silver), which shows how many portals they have correctly rated through the Niantic Wayfarer programme. The players received evaluation sheets and completed them within about a week. The last part of the study was the analysis of the collected data, which used the weighted average method and frequency distribution.

Discussion

After identifying all POI in the Old Town area, they were classified according to type (see Figure 1). The largest group of portals is commemorative plaques (a little over 27%) and wall decorations (almost 20%). Larger and more recognisable monuments such as monuments, sculptures, and fountains constitute less than 16%, while historic buildings and museums constitute almost 12% of POI in the analysed area. Less numerous groups of portals include churches and religious buildings (approx. 7%), restaurants and hotels (approx. 4%), and recreational facilities (approx. 2%). The smallest group of portals is sponsored facilities (2%), which are created in player meeting places during events organised globally in the game, i.e. Community Days or Raid Hours. In these places, *Pokémon GO* fans can also meet Community Ambassadors, who often award the participants with various prizes. Sponsored portals also have a promotional function. They are currently advertising the GO Fest event, which is scheduled for July 2024 in Madrid.

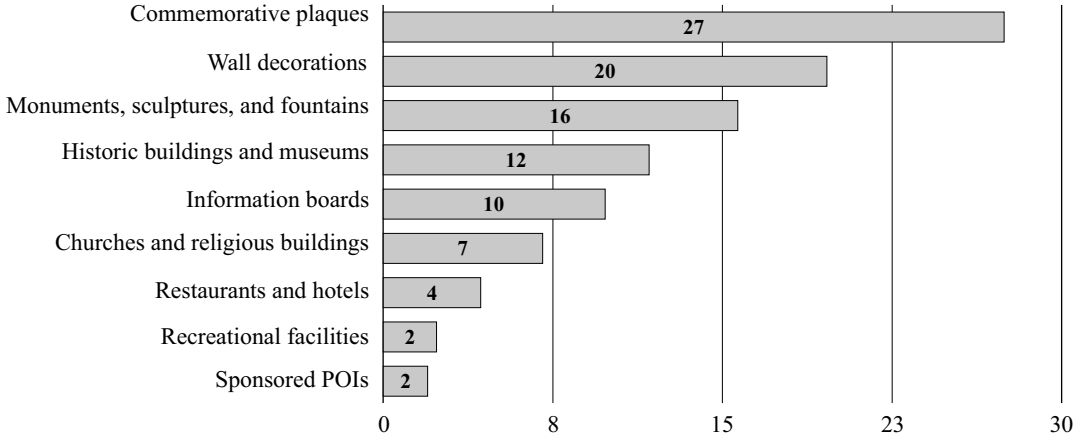

Figure 1. The thematic structure of POIs in the Cracow Old Town [in %]

Source: Own elaboration.

As mentioned, the Old Town has numerous tourist attractions, so an important element of the study was its division into smaller parts with certain characteristic points (see Figure 2).

Thus, 7 areas have been distinguished (A–G). They are separated by the following streets:

A – the north-eastern part of the Old Town between Szpitalna Street and Mikołajska Street; the main attraction here is The Juliusz Słowacki Theatre;

B – the northern part of the Old Town between Szpitalna Street, Sławkowska Street, and the Main Market Square; the biggest attractions in this area are the Barbican and the Florian's Gate;

C – the north-western part of the Old Town, separated by Sławkowska Street, the Main Market Square, and Wiślna Street; Collegium Maius is considered to be the most important attraction here;

D – the central part of the Old Town, separated in the south by Franciszkańska Street, in the east by Wiślna Street and the Main Market Square, and in the north by the Main Market Square and Mikołajska Street; the most important attractions here are the Cloth Hall and St. Mary's Basilica;

E – the southwestern part of the Old Town, the west of Grodzka Street and bordering on Podzamcze Street in the south; the biggest attraction of this area is the Franciscan Basilica and the Archaeological Museum;

F – the southeastern part of the Old Town, the east of Grodzka Street; the main attraction in this area is the Baroque Church of Saint Peter and Paul;

G – the southernmost part is separated by Podzamcze Street, Bernardyńska Street, and the Vistula River; the main attraction here is the Wawel Royal Castle.

The respondents assessed all portals in the Old Town area according to four criteria. A weighted average was derived from these ratings, which made it possible to determine the quality of portals in selected parts of the Old Town (see Figure 3).

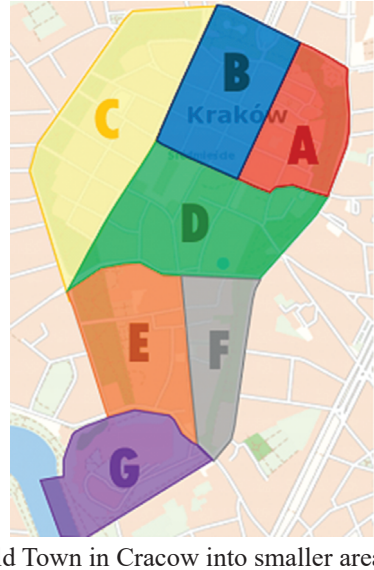

Figure 2. The division of the Old Town in Cracow into smaller areas

Source: Own elaboration.

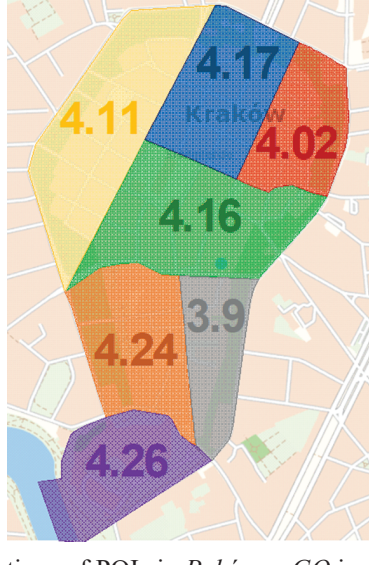

Figure 3. The average quality ratings of POIs in *Pokémon GO* in selected parts of the Old Town in Cracow

Source: Own elaboration.

Part F received the lowest average rating (3.9). This was due to the presence of portals with illegible names (including Latin and French) and low-quality photos. Part A was the second worst rated area (average 4.02). The main complaints concerned recreational portals with poorly chosen names and blurry photos.

Area G was rated the highest by players (average 4.26). Both the monuments located on the Wawel Hill and the RMF Star Trail, which is located along the Vistula River, received high marks. Area E received very similar average scores (4.24). Such a high rating resulted primarily from the excellent quality of portals in the form of information boards on benches in the Planty area.

The last part of the analysis is the presentation of average ratings depending on the topic of the portal (see Figure 4).

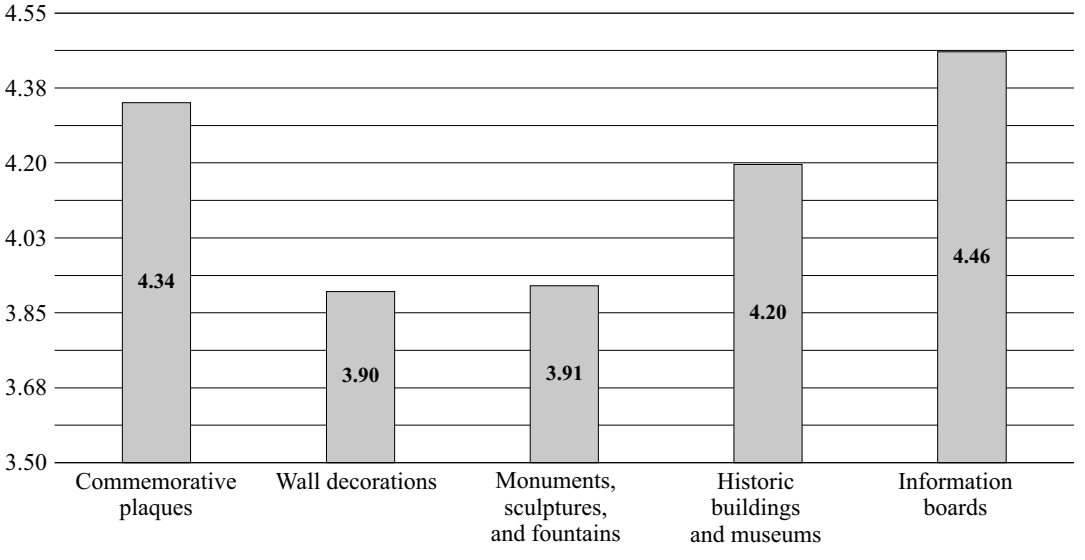

Figure 4. The average ratings of POIs in Cracow's Old Town depending on the type of portal

Source: Own elaboration.

The highest scores are given to information boards (average 4.46) and commemorative boards (4.34). This is due to easy access to the information written on them, which allows portal creators to present these POI in an interesting way. Wall decorations (average 3.9) as well as monuments, sculptures, and fountains (average 3.91) were rated much lower. This was due to illegible names, often in foreign languages, and blurry photos. Moreover, in some cases, the difference between the real and virtual location of the portals was several or a dozen metres, which contributed to lower ratings.

Conclusions

To sum up, the quality of portals in the *Pokémon GO* game in the Old Town area of Cracow is highly rated by players. The participants appreciated, above all, the high consistency of POI locations in the game compared to their real location. There were only few discrepancies in this aspect. The names of most portals were also correct and clearly indicated what type of object the player was dealing with. Photos showing portals in the game were mostly legible, and

in some cases their number even exceeded 20. The biggest drawback of the analysed POI were the descriptions that were missing in the case of a significant number of Pokéstops and Gyms.

Interesting conclusions are drawn from the average ratings according to the thematic classification of portals. They clearly indicate that the most recognisable POI, i.e. historic buildings, museums, monuments, and fountains are of lower quality than less characteristic objects, i.e. information boards and commemorative plaques. Therefore, it can be assumed that visiting the Old Town in Cracow using *Pokémon GO* will be more interesting for people who want to get to know little-recognised and hidden „gems" rather than the most famous monuments of this area.

Most portals are described in Polish, and only few have both Polish and English descriptions. From the perspective of foreign tourist players, this is an inconvenience that makes it impossible to get to know POI through *Pokémon GO*. If large global events are organised in the future, e.g. GO Fest or City Safari, it is in the interest of the local people to be able to identify portals also in English, which would arouse the interest among foreign tourists.

Introducing corrections and new portals by players is a long and demanding process. POI in the Old Town have many positive features, but there is still room for their development, which may have a positive impact on the recognition of various types of objects by players.

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The Evaluation of the Use of Container Houses in Meeting Housing Needs Based on a Survey of Real Estate Agents

Abstract

Objectives: The problem of housing needs requires continuous monitoring as well as analysis and evaluation of its solutions. One such solution could be container housing, positive examples of which can be found abroad, e.g. in Sweden or Canada. For this to happen, an attempt should be made to assess whether this type of construction has a chance to appear in Poland and whether it can be an attractive segment from the point of view of the market and meeting the needs of buyers. Therefore, the objectives of the study were to assess: (1) whether container housing can become a segment seriously considered in the context of meeting housing needs in Poland; (2) the interest of potential buyers of housing in container housing; (3) the attractiveness of container housing.

Research Design & Methods: To achieve the objectives, a survey was conducted in Q4 2023 among 67 real estate agents as entities that serve clients on a daily basis and know their needs and preferences.

Implications / Recommendations: The obtained results indicate that it is currently difficult to say unequivocally whether container housing can become a segment seriously considered for meeting housing needs in Poland. On the one hand, the results show that there are serious doubts about this (small number of offers, low customer interest, little knowledge of the subject, customer fears), while on the other hand, container flats can be visually attractive to customers, are full-featured, and, most importantly, are definitely cheaper than those built with traditional technology. These could be the factors for the potential success of this market segment, perhaps even on such a scale that more mass production of this type of housing would become the so-called 'game changer' of the market.

Contribution / Value Added: It is necessary to increase people's awareness, promote this type of construction (including showing positive examples from abroad), and reduce fears and doubts about living in container buildings.

Keywords: housing property, modular homes, real estate market, container housing, housing needs

Article classification: research article

JEL classification: O18, R21, R33

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Introduction

The problem of housing needs in Poland is described quite extensively in the literature. Firstly, it is pointed out that it must be treated in a special way due to the importance of housing in human life. The confirmation of this thesis can be found, *inter alia*, in Article 75 of the Constitution of the Republic of Poland, which states that the authorities are to support citizens in satisfying their housing needs. Studies also emphasise the formal entrenchment of housing in international documents and the rank in the satisfaction of needs related to the functioning of households, the exceptional character of a good which should be covered by the scope of the state (Andrzejewski, 1979; Cesarski, 2017, Koszel & Strączkowski, 2021; Lis, 2005, 2021; Twardoch, 2015, 2021). Secondly, there are very dynamic changes in the housing environment that are causing, or will sooner rather than later cause, tensions in meeting housing needs. It is sufficient to mention three issues: (1) the housing problem of young people and the low availability of housing (low purchasing capacity of young people); (2) the ageing of the population (questions about the adaptation of the housing stock to the needs of senior citizens); (3) the influx of large numbers of refugees, both as a result of the Russian-Ukrainian conflict and for economic reasons (from Africa or Asia). Thirdly, the problem of meeting housing needs is related to the requirements for new housing.

As far as the housing problem of young people is concerned, it is mainly due to high prices of flats, especially in large Polish cities, and the relatively low earnings of the youngest clients on the market. This is confirmed, among others, by studies by B. Marona and K. Tomasik, A. Czerniak, as well as Ł. Strączkowski, which indicate that there is a problem of economic accessibility with regard to housing and related restrictions of the mobility of young people in Poland. The decrease in the ability to purchase a flat is still progressing, which is the result of (apart from the increasing prices): the increase in interest rates on housing loans, the tightening of policy regarding the assessment of creditworthiness, and the increase in the cost of living. At the same time, it should be added that the level of the housing affordability index is the lowest since 2012 (Marona & Tomasik, 2023; Czerniak, 2023; Strączkowski, 2022).

In the case of demographic changes in Poland, on the other hand, the ageing of the population is considered to be key. According to projections by the Central Statistical Office (GUS), by 2050, almost every third Pole will be aged 65 or over. It is estimated that the old-age ratio will then reach 32.7%, of which 10.4% will be people aged 80 and over (GUS, 2014). In addition, the group of people aged 80 and over is characterised by the highest rate of change. This phenomenon is referred to by demographers as the double ageing of the population (Deniszczuk, 2001, p. 10). The increasing proportion of elderly people in the population is not only a problem for health care, pensions, and the Social Insurance Institution (ZUS), but also a key challenge for the housing economy. As indicated by T. Bojęć, P. Chimczak, J. Kowalska, and D. Różewicz, there is a shortage of adapted housing in Poland. In housing estates, the number of architectural barriers excludes many seniors or people with reduced mobility from daily functioning and creates the phenomenon of the so-called 'fourth-floor prisoners'. The scale of these phenomena, coupled with the projected demand, make it necessary to look for solutions today. If solutions are not discussed and sought, the future will only bring higher social costs (Bojęć et al., 2020, pp. 50–55).

Finally, in the demographic-economic layer, the influx of refugees, whether for political or economic reasons, cannot be forgotten. Estimates of the number of foreigners in Poland vary. The Central Statistical Office indicates that the number of foreigners working in Poland is close to 990,000 (GUS, 2023). Similar data is presented by ZUS, according to which the number

of foreigners in pension insurance amounted to over 1 million persons (ZUS, 2022). In turn, a report by the Warsaw Enterprise Institute shows that the total number of immigrants in Poland (legal and illegal) can be estimated at around 3.5–4 million, with Ukrainians staying in Poland in September 2023 at 2.5–3 million people (Piekutowski, 2023). Obviously, these people have to live somewhere in Poland and are therefore users of Polish housing stock.

Meanwhile, there is still a housing shortage in Poland. Although, according to the Census of 2021, it is known that the number of dwellings amounted to 15.2 million units, and the number of households to 12.5 million (i.e. there are more dwellings than households). (1) There are socio-demographic changes, the consequence of which is also a decrease in households. (2) Part of the dwellings in the resources are units of a reduced standard (e.g. without bathrooms and toilets). (3) It is an indicator of the form: the number of dwellings per 1,000 inhabitants is used to show the shortage of dwellings. Thus, if one assumes, following the Ministry of Development report of 2020 (Ministerstwo Rozwoju, 2020, p. 12), that the target indicator of the housing saturation in Polish conditions is a value of approximately 450 dwellings per 1,000 inhabitants, then at the end of 2022, Poland is short of approximately 1.4 million dwellings. All this makes it necessary to take a fresh look at housing issues, including the construction of new units, through the prism of new challenges posed by the dynamically changing environment, looking for various possibilities to satisfy one of the basic human needs.

The possibility of using container housing for housing purposes

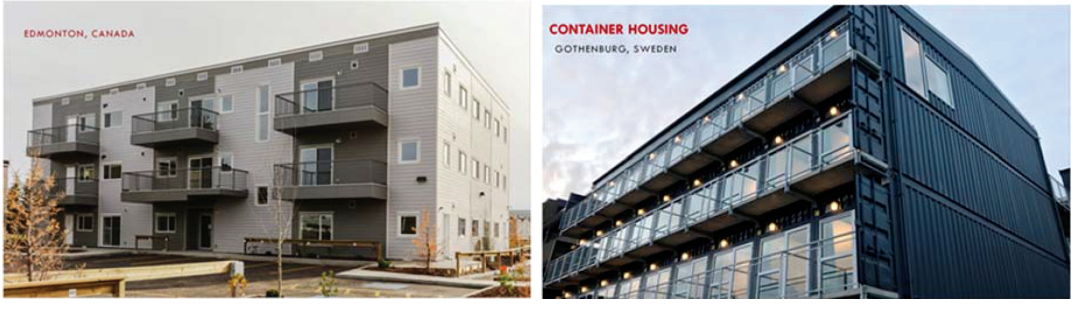
Modular housing is one of the modern construction methods. Each modular construction consists of a number of separate modules, and each module is a three-dimensional object that is able to provide usable space due to its size. Modules are designed for permanent or temporary housing, storage, public purposes (e.g. for hospitals). They can be intended exclusively for new buildings, but can also be used for additions and superstructures to buildings or can be incorporated into existing buildings, and the quality class of the provided modules depends on the demand side (the customer ordering them) and the supply side (the supplier) (Kyjaková & Bašková, 2016).

There are various benefits of modular construction. Researchers focus on different aspects. For example, K. E. Hwang, I. Kim, J. I. Kim, and S. H. Cha include the possibility of using standardised and repeatable modules that clients can tailor to individual preferences. They also point out that the modularisation of spatial units enables the project to be assembled quickly and easily (Hwang et al., 2023). In turn, L. Kyjaková and R. Bašková highlight the reduced requirements for facilities and equipment used on construction sites (finished components arrive), a safer working environment at the component manufacturing site (a kind of house factory), faster construction and optimised labour costs, fewer design errors and better quality in component production, easier quality control on site at the factory, less waste on site, and less pollution during construction (Kyjaková & Bašková, 2016). In contrast, H. Michalak adds that modules allow the creation of hundreds of setup options while maintaining the same unit load-bearing structure; modular architecture is relatively lightweight and can be easily adapted to most types of construction due to its repeatability and mobility (Michalak, 2021).

One segment of modular construction is container construction. As ca be guessed, the basic building block is a shipping container. This can be a brand new container or one that has been decommissioned and used for architectural purposes. This reduces the environmental impact of a steel container by extending its useful life. This is quite important, because, if they are

not reused, they will be deposited in landfills and pose a huge environmental burden in terms of disposal (Anagal & Dhongde, 2017). Added to this is the fact that buildings are the largest energy consumers, accounting for almost 40% of all energy consumed. Therefore, the need to develop and design more efficient buildings is increasingly being highlighted. These are exactly the kind of buildings that can be constructed using container technology while maintaining self-sufficiency or energy efficiency (Bowley & Mukhopadhyaya, 2017; Wellcamp, 2024).

Container homes are an interesting solution to the world's housing problem. Over the last 30 years, they have become a popular housing solution worldwide. As can be pointed out in the literature, recent years have highlighted the enormous potential for the use of containers in housing. This potential is seen in the cuboid shape and in the creation of a whole building from smaller, identical or very similar, elements. Another argument in favour of the use of containers is the relatively quick construction process compared to traditional construction. The individual elements of the building block, which are, *de facto*, prefabricated elements, are ready to be modified and set up in the appropriate configuration (Gomółka & Furmańczyk, 2022). To this, the use of structurally new containers, or the re-use of shipping containers, offers a number of advantages, the most important of which are cost-effectiveness, environmental friendliness, durability, versatility, and portability. This makes them an attractive alternative housing solution for those seeking sustainable, innovative, and cost-effective housing options. Given the affordability of housing built with this technology, the trend of building with this technology can be expected to grow in popularity as a viable and sustainable housing solution in the years to come (Palcis, 2023; Executive-moving, 2024).



a) Westgate Manor – Edmonton, Canada **b)** Nova Deko Modular – Gothenburg, Sweden

Figure 1. Examples of the use of shipping containers for housing purposes

Source: a) https://i.ytimg.com/vi/JWKSvI2PcZY/maxresdefault.jpg [accessed: 26.05.2024]; b) https://i.ytimg.com/vi/abd27o76eLo/maxresdefault.jpg [accessed: 26.05.2024].

To think seriously about container construction, it is also worth looking at positive examples of the use of such elements in foreign housing projects. The first site, illustrated in Figure 1a, can be the Westgate Manor development completed in 2018 in Edmonton, Canada. This is an example of a multi-family building that used 48 steel shipping containers for optimisation along the dimensions of: the speed of construction, minimum cost, minimum environmental impact. In the three-storey, year-round building, there are 20 one- and two-bedroom units (ShelterMode, 2021a). The second example (Figure 1b.) shows a building made up of 162 specially designed flats (each with an area of 26 m2), distributed over 5 floors. The entire complex, built

in 2017 in Gothenburg, Sweden, comprises three student housing buildings, which were completed in three phases. Each building has been arranged around a central courtyard, accessed by stairs, with walkways providing access to each capsule and bridges connecting all levels (ShelterMode, 2021b).

Research proceedings

Examples that are positively evaluated can be multiplied. However, questions arise: Since other countries, richer than Poland, use this kind of technology, would it also be possible to use the container building material in Poland? Would there be buyers on the housing market? How would they assess such projects? And, finally – could container housing become a serious segment in meeting housing needs? Looking at the possibilities of using container housing for housing, the positive experiences, and the scale of Polish housing needs, the problem is worth further reflection and research.

As the use of container housing on a mass scale in Poland is minimal, doubts also arose as to how this problem could be studied – who could be the subject of the study, what could be studied, and, finally, how to study this problem. Looking for the possibility of solving the situation, in the Department of Investment and Real Estate of the Poznań University of Economics and Business, the research topic was undertaken – 'possibilities of satisfying housing needs through the use of container construction'. Table 1 shows the assumptions for the research procedure.

Table 1. Information on the research procedure

Specification	Description
The objectives of the study	1) The assessment of whether container housing can become a segment seriously considered for meeting housing needs in Poland; 2) The assessment of interest of potential buyers of flats in container housing; 3) The assessment of the attractiveness of container housing.
The material scope of the survey	The subject of the research – real estate agents; as persons providing services to clients, they are familiar with clients' problems, hence they can be considered experts. Also – preferences of potential buyers concerning container flats.
The spatial scope of the study	The Wielkopolskie voivodeship
The temporal scope of the survey	Q4 2023; the time scope of the survey coincided with the time of information collection
Sampling and sample size	A non-random, purposive selection was used, also dictated by the availability of the respondents; the sample size was n=67 units.
Survey instrument	Online survey questionnaire – it included questions with nominal and ordinal levels of measurement; all questions were closed; apart from the part related to the subject of the survey, the questionnaire also included a metric in order to be able to differentiate the answers according to the characteristics of the intermediaries at a later stage.

Source: Own work.

Three points in Table 1 seem to need clarification. The first one is – why real estate agents? It was considered that, as a market actor serving clients on an ongoing basis, intermediaries are aware of the expectations and preferences of housing buyers. As such, they can assess potential customer interest in container housing. Second – is the sample size of n=67 intermediaries a large

number? In answering this question, it is important to be aware of the possibility of reaching respondents. In general, given the nature of their work, it is difficult to encourage them to take the time to complete questionnaires. Nonetheless, in cooperation with a local association of realtors, the project was successful. So, as far as the presented numbers are concerned: according to the data published by the National Bank of Poland, the number of realtors in Poznań reaches 408 units (Łaszek, 2023, p. 276), the number of members associated in the local organisation of realtors is 163 (WSPON, 2024), while in the register of the Polish Real Estate Market Federation, 215 entities from the Wielkopolska region can be found (PFRN, 2024). This means that, in percentage terms, we have managed to survey quite a large group of realtors (16% according to NBP, 41% according to WSPON, 31% according to PFRN), even more so taking into account the specialisation of realtors in Poland (the answers were given by entities servicing the housing market).

The third point is how the respondents were enabled to assess the container-built dwellings. Well, each of the intermediaries received drawings of such flats. Only after looking at the designs did the respondents give their opinions in relation to this segment of dwellings and customer preferences. The questions in the survey questionnaire were prepared in accordance with the methodological recommendations found in studies on marketing research methodology (Mazurek-Łopacińska, 2005; Kaczmarczyk, 2003).

Research results

Among the respondents, 33% of the realtors confirmed that they had never personally dealt with container housing. Another 21% said that they had had contact with this type of market product, but in relation to small houses, rather erected on allotment gardens. The remaining group, representing 46% of the total, confirmed that they had come across offers of container housing, but this was not related to their activities, but, rather, emerged on the basis of browsing various news or interesting facts from the market, or offers from competitors.

From the point of view of the potential for container housing to meet housing needs, the key questions were the interest in this type of housing among customers, the availability of such offers on the market, and, finally, whether there was a chance that container housing for housing could become a key segment in the next three years. Answering the first question, the respondents (69%) stated that there is basically no or very little such interest. Only 2% were of the opposite opinion, indicating quite high interest. Most likely, one of the reasons for this distribution of answers is the lack of a sufficiently large number of offers on the real estate market. This is confirmed by the distribution of answers in the next question – as many as 82% of the respondents indicated that there are no such offers of flats for sale or the number of offers of such flats is very small. Thus, in the opinion of the respondents, the chance that the Polish market could become one of the key segments for satisfying housing needs within the next three years is relatively small, as is estimated at 38%.

Although the result obtained is not high, it is also not very low. Rather, it means that there are some opportunities for this market segment to be promoted. The question is – what to do to make it more widely known? The respondents' answers are presented in Figure 2.

As can be seen, in order for the segment to develop, it is necessary to spread knowledge among people (75% of indications). Education in this area could prove to be the most important, as this would make many customers realise that the cost of buying a container flat is significantly lower compared to one built with technologies commonly used by developers. The time needed to

complete the investment could also play an important role – significantly shorter than in traditional building methods.

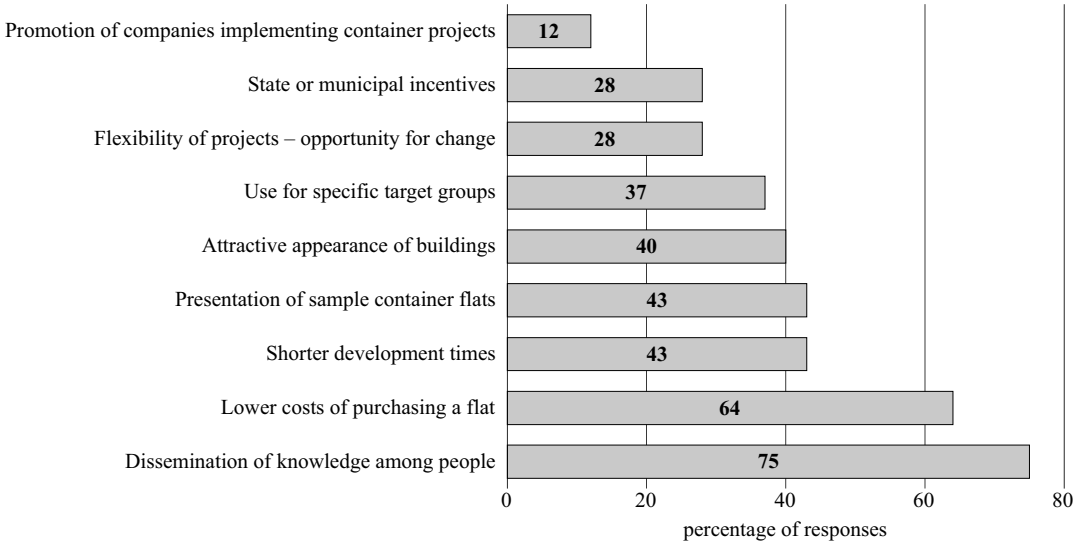


Figure 2. Factors that could positively influence the opportunities for the development of container housing for residential purposes

Source: Own research.

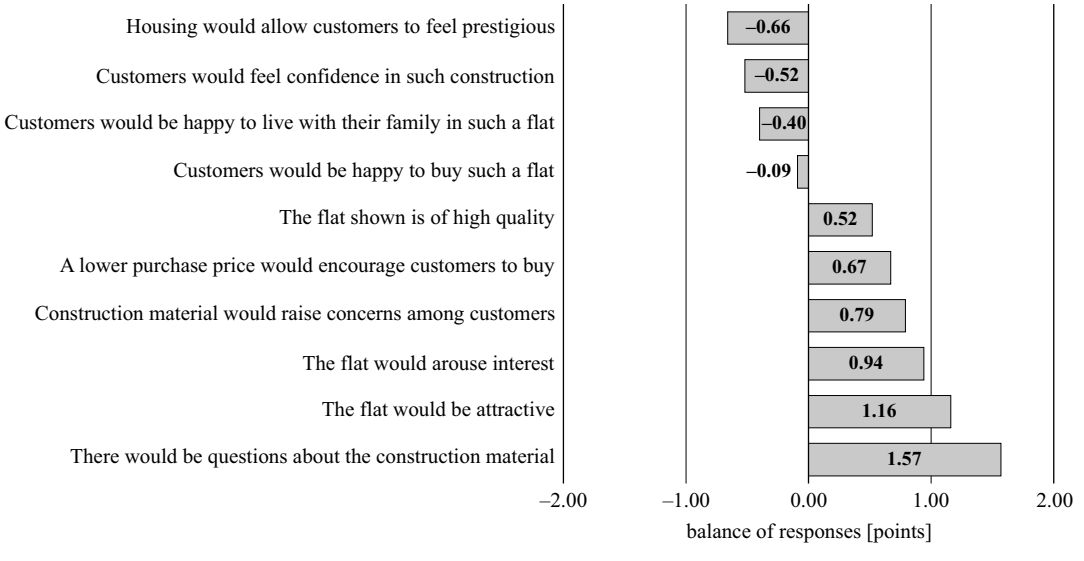


Figure 3. The evaluation of container dwellings through the lens of dwelling purchasers' preferences

Source: Own research.

The factors indicated in Figure 2 take on greater significance when juxtaposed with the intermediaries' assessment of the container dwelling. These evaluations, in the form of response

balances, are presented in Figure 3. It should be added that negative values of the balances indicate negative evaluations, while positive values indicate positive evaluations.

As can be seen, the shown container dwelling was assessed quite positively – it would appeal, it would generate interest, it is visually complete, and the lower purchase amount could act as an incentive to customers. However, there would certainly be questions from customers about the construction material, which could raise concerns for reasons such as durability or safety. Concerns translate into negative evaluations – clients would rather buy such a dwelling and be reluctant to live in it with their family. Further, the flat would not give a sense of prestige.

Conclusions

What do these results mean? Firstly, it is difficult at this stage to say unequivocally whether container housing can become a segment seriously considered in the context of meeting housing needs in Poland. On the one hand, the results indicate that there are serious doubts about this (small number of offers, low customer interest, little knowledge of the subject, customer fears). On the other hand, container flats can be visually attractive to customers, they are full-featured, and, most importantly, they are definitely cheaper than those built with traditional technologies. These could be the factors for the potential success of this market segment, perhaps even on such a scale that more mass production of this type of housing would become the so-called 'game changer' of the market. For this to happen, however, it is necessary to raise people's awareness, promote this type of construction (including showing positive examples from abroad), and reduce fears and doubts about living in container buildings.

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Research Ethics Committee

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Conflicts of Interest

The authors declares no conflict of interest.

Data Availability Statement

All data will be available and shared upon request.

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