GEOMATICS AND ENVIRONMENTAL ENGINEERING • Volume 19 • Number 2 • 2025

https://doi.org/10.7494/geom.2025.19.2.5

Alina Kulczyk-Dynowska[1], Maria Hełdak[2], Sultan Sevinç Kurt Konakoğlu[3], Katarzyna Przybyła[4]

Housing Stocks of Polish Counties during Period of 2010–2022: Prism of Quantitative and Qualitative Changes after Taking Context of Flipping into Account

Abstract: Access to housing stock directly determines one's quality of life, and a property that meets one's housing needs is usually the most valuable household asset. Any changes in the housing stock are, therefore, important to society. The Polish real estate market has not only been developing dynamically in recent years but has also been influenced by various measures of state interventionism. Even though the first phenomenon should be evaluated positively, interventionism highlights the imperfection of the analyzed market and makes us lean toward the phenomenon of flipping. The article presents selected features of the housing stock in Poland from the period of 2010–2022 (the synthetic-development-measures method was used) as well as attempts to draw attention to flipping as a phenomenon on the real estate market.

Key words: real estate market, housing stock, housing supply, flipping, regional housing market

Received: December 9, 2024; accepted: February 3, 2025

[1] Wrocław University of Environmental and Life Sciences, Institute of Spatial Management, Wrocław, Poland, email: alina.kulczyk-dynowska@upwr.edu.pl, https://orcid.org/0000-0002-1312-3224

[2] Wrocław University of Environmental and Life Sciences, Institute of Spatial Management, Wrocław, Poland, email: maria.heldak@upwr.edu.pl (corresponding author), https://orcid.org/0000-0002-6171-8548

[3] Amasya Universit, Faculty of Architecture, Department of Urban Design and Landscape Architecture, Amasya, Turkey, email: sultansevinckurt@gmail.com, https://orcid.org/0000-0001-5383-0954

[4] Wrocław University of Environmental and Life Sciences, Institute of Spatial Management, Wrocław, Poland, email: katarzyna.przybyla@upwr.edu.pl, https://orcid.org/0000-0002-9717-1599

1. Introduction

The stock of residential premises meets the housing needs of approx. half of Poland's population. Poland's housing stock is growing – during the base year (i.e., 2010), there were 13.5 million housing units with a total area of 973.9 million square meters and 51.3 million rooms. At the end of December 2022, the housing stock had increased to 15.6 million apartments with a total area of 1172.9 million square meters and 59.7 million rooms [1]. The condition of the housing stock is important – not only for the development of society, but also for the growth of the national economy; this is a universal problem that is not only noticed in Poland [2]. Having a place to live influences family stabilization, improved of living conditions, and social integration. In addition, investments in housing infrastructures contribute to economic growth by stimulating the construction sector and increasing employment. It is therefore important to be aware of the housing stock in specific locations; for the purposes of this article, a county perspective was adopted.

An acute problem – primarily in large cities – is the unaffordability of residential premises that has resulted in the less-affluent part of the population being unable to finance housing-purchase transactions with their own funds and its lack of sufficient creditworthiness. The insufficient availability of residential premises is directly reflected in government-assistance programs. In recent years, these have included the following (in parentheses: years of validity): "Family on Their Own" (2007–2013), "Housing for the Young" (2014–2018), "Apartment Plus" (2017–2019), "Flat for a Start" (2017–2019), "Borrowers' Support Fund" (2015–present), and "2% Safe Mortgage" (2023). Currently, work is underway regarding the assumptions of a program that offers preferential credit for "Flat for a Start" – the Ministry of Development and Technology indicated that the likely launch date for the release of funds was to be the second half of 2024. In light of the above, any activity that can result in increased housing prices (and, therefore, exacerbate the problem of their unaffordability) is worthy of attention. In this context, the issue of flipping is becoming increasingly noticeable. A legitimate question to be asked is what exactly is flipping about? Should flipping be approached as a threat that needs to be eliminated by means of legal regulations, or should it rather be considered one of the natural phenomena that occur in the market economy?

It should be emphasized that flipping is recognized worldwide [3]. Researchers describe it as a negative phenomenon for the real estate market [4], and some even consider it to be on the verge of illegal activity [5]. On the other hand, it is important to remember the freedom of trade in market economies and the possibility of short-term investments in the real estate market (which absolutely cannot be equated with an undesirable phenomenon) [6].

The purpose of this article is to present the selected features of the housing stock in Polish counties during the period of 2010–2022 (synthetic development measures SDMs were used) and attempt to highlight flipping as a phenomenon on the real estate market.

2. Material and Methods

The spatial scope of the conducted research covers Polish counties (including those cities with county rights). The following research questions were formulated:

- Do the counties vary in terms of the quality and volume of their housing stocks?
- Is there a correlation between the multiplicity and quality of housing stocks in the counties?
- Which counties have recorded the highest increases in the numbers of market transactions in the housing stock market?
- Is it possible to define flipping for scientific purposes?

The first stage of the research was focused on identifying the housing stock. For this purpose, data that was retrieved from the Local Data Bank of Statistics Poland was used. Two synthetic development measures (SDMs) of the housing stock in the analyzed counties were constructed (in both cases, they were considered to be one set of 380 objects). The construction of the SDMs started with determining those variables that were subjected to a process of unitization for the entire studied period simultaneously.

For the purpose of determining the SDMs' characterization of the volume of the housing stock (SDM_{volume}), the following features were defined:

1) total number of residential units,
2) usable area of residential units in square meters,
3) number of residential units per 1000 residents.

For the purpose of determining the SDMs' characterization of the quality of the housing stock ($SDM_{quality}$), the following features were defined:

1) average floor area of residential unit per resident,
2) percentage of total residential units that are equipped with bathrooms,
3) percentage of total residential units that are equipped with central heating.

The choice of a feature resulted from the need to capture the volume of the stock (SDM_{volume}) and, indirectly, its availability as well as the stock quality and, indirectly, the comfort of its users ($SDM_{quality}$). The construction of the SDM_{volume} indicator reflected the actual resource wealth of each county (thus, favoring larger counties). The authors were aware of this, but, Features 1 and 2 (per capita and per square kilometer, respectively) were left without adjustment in order to illustrate the background of the flipping development. It should be noted that, in the case of $SDM_{quality}$, the "percentage of total residential units equipped with a gas connection" feature was deliberately dropped due to the fact that gas is being increasingly abandoned in new developments. The availability of statistical data was an important factor that limited the construction of this SDM. The nature of the features in both SDMs allowed us to consider them to be stimulants without a veto threshold;

i.e., the counties that presented high values received the highest rankings. Using the method of standardized sums, our SDM was constructed (a common development pattern was adopted for the entire period under study). The above allowed us to determine the counties' rankings for both SDMs and compare changes in the counties' positions for each analyzed year.

Unitarization Z was performed according to Formula (1):

$$Z_{jit} = \frac{X_{jit} - \min X_{jit}}{\max X_{jit} - \min X_{jit}} \tag{1}$$

where:

x – value of features,
j – variable, where $j = 1,..., p$,
i – object (county), where $i = 1,..., N$, $N = 380$,
t – time (year), where $t = 2010,..., 2022$.

Unitarization resulted in obtaining values that were within a range of [0, 1]. It was not necessary to standardize the preference function – all of the variables were stimulants. The method of standardized sums was used in the SDMs' construction [7].

The value of the SDM for the analyzed counties was calculated using Formula (2):

$$\mathrm{SDM}_{it} = \frac{1}{p}\sum_{j=1}^{p} Z_{ijt} \tag{2}$$

where:

SDM – value of model-free synthetic measure in object (county),
p – number of features,
i, j, t – as in Equation (1).

For both SDMs, the highest value equaled the most favorable situation. The last step consisted of assigning ranking positions to the studied counties and making comparisons based on the positions that were determined by the analyzed SDM.

In order to complete the classification of the counties by their rankings, the counties were additionally divided into four classes. Class intervals (groups) were determined using two parameters: the arithmetic mean, and the standard deviation of the values of the calculated synthetic measures.

The following class intervals (groups) were identified:

– Class A (highest level of activity):

$$\mathrm{SDM} > \overline{\mathrm{SDM}} + s_{\mathrm{SMR}},$$

– Class B (medium-high level of activity):

$$\overline{\mathrm{SDM}} + s_{\mathrm{SDM}} > \mathrm{SDM} \geq \overline{\mathrm{SDM}},$$

– Class C (medium-low level of activity):

$$\overline{\mathrm{SDM}} > \mathrm{SDM} \geq \overline{\mathrm{SDM}} - s_{\mathrm{SDM}},$$

– Class D (lower level of activity):

$$\mathrm{SDM} \leq \overline{\mathrm{SDM}} - s_{\mathrm{SDM}},$$

where:

$\underline{\mathrm{SDM}}$ – value of synthetic development measure ($\mathrm{SDM}_{\mathrm{quality}}$, $\mathrm{SDM}_{\mathrm{volume}}$),
$\overline{\mathrm{SDM}}$ – arithmetic mean of synthetic development measure value ($\mathrm{SDM}_{\mathrm{quality}}$, $\mathrm{SDM}_{\mathrm{volume}}$) for counties,
s_{SDM} – standard deviation of synthetic development measure value ($\mathrm{SDM}_{\mathrm{quality}}$, $\mathrm{SDM}_{\mathrm{volume}}$) for counties.

Based on the values of both SDMs and the numbers of residential premises that were sold in market transactions, the studied counties were assigned rankings; comparisons were then made based on these rankings. The strength of the correlation between the $\mathrm{SDM}_{\mathrm{quality}}$ and $\mathrm{SDM}_{\mathrm{volume}}$ stock values were examined as well as between both SDMs and the numbers of residential premises that were sold through market transactions. For this purpose, the calculation of Spearman's rank-correlation coefficient r_s was planned [8, 9] using the following formula [10]:

$$r_s = 1 - \frac{6\sum_{i=1}^{N} d_i^2}{N(N^2 - 1)} \tag{3}$$

where d_i determines differences between ranks (positions) of corresponding values of each SDM_{it} or number of residential premises sold in market transactions, and N represents the number of observations.

The scale below was used to assess the strength or correlation of the values [10]:
– |0.00–0.30| – weak correlation,
– |0.31–0.60| – moderate correlation,
– |0.61–1.00| – strong correlation.

The research results were presented separately in graphic form for each of the analyzed counties (the QGIS 3.34.9 "Prizren" program was used). When presenting the analysis results, special attention was paid to the selected years; i.e., the first and last years of the study (to improve readability).

3. Results

3.1. Housing Stock of Polish Counties

The analysis of the SDM_{volume} value was performed by taking 2010 as the base year; any changes of no more than 10% of the SDM_{volume} value in 2010 were considered to be insignificant. A comparison for the first and last years of the studied period showed that a drop in the measure value was recorded only in Wałbrzych County; however, the administrative changes that occurred in the county should be taken into account – as of January 1, 2013, the city of Wałbrzych was excluded from Wałbrzych County and was given the status of a city with county rights. Had this administrative change not occurred, Wałbrzych County would have recorded an increase in the analyzed measure (like all of the other counties) – even above the adopted significance threshold.

The arithmetic mean of the SDM_{volume} value that was calculated for the set of all of the analyzed counties increased throughout the entire studied period; this was 0.099 in the base year and 0.16 in the last year (i.e., a 61% increase). This fact should be assessed positively. A medium level of activity was the dominating one (see Table 1).

Table 1. Classification of counties according to SDM_{volume} values in 2010 and 2022

Specification	Number of counties	
	2010	2022
Class A – highest level of activity	39	41
Class B – high level of activity	102	94
Class C – medium level of activity	221	231
Class D – low level of activity	18	14

During the analyzed period, 12 cities with county rights placed in the top-ten ranking positions at some point; this was calculated based on the values of the discussed synthetic measure. Throughout the entire studied period, the leaders were as follows: Gdańsk, Katowice, Krakow, Łódź, Poznań, Szczecin, Warsaw (the capital city), and Wrocław. In addition, the remaining top-ten leaders included Chorzów (2012–2013), Gdynia (2010–2014), Lubin (2013–2022), and Sopot (2012, 2015–2022) during each of the periods that are presented in parentheses. Warsaw was the dominant one – the capital city topped the ranking throughout the analyzed period. The spatial distributions of the described measure are presented in Figures 1 and 2.

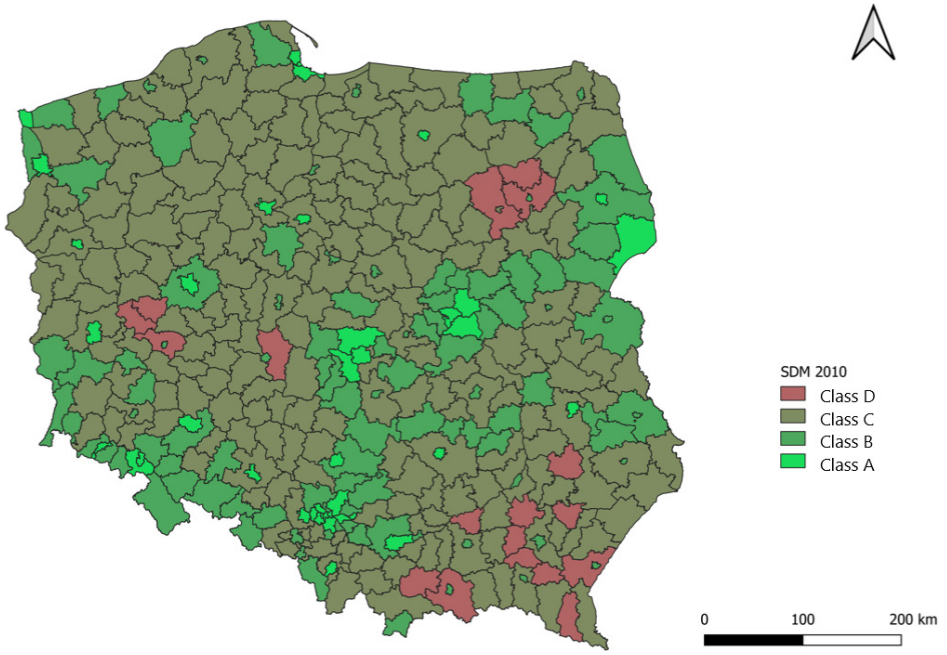

Fig. 1. SDM_{volume} data for counties – 2010

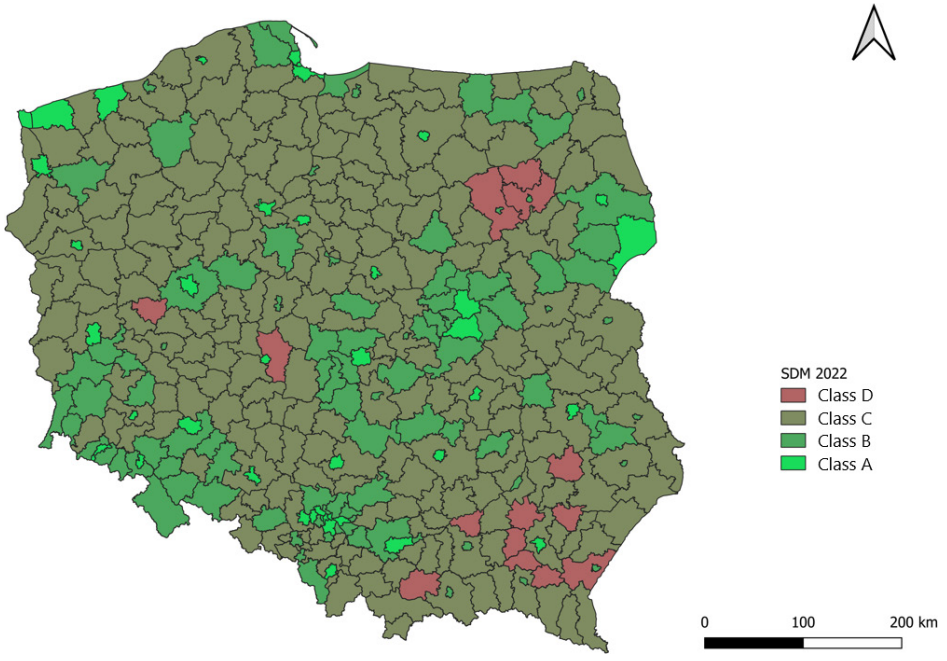

Fig. 2. SDM_{volume} data for counties – 2022

A comparison of the rankings from the beginning and end of the studied period allowed us to conclude that 195 analyzed counties recorded declines, 172 recorded increases, and 13 maintained their positions. There was a significant variation in the value of the SDM_{volume}. A positive (although very weak) trend of the decreasing difference between the first and last objects in the ranking could be observed. During the base year, the value of the analyzed measure for the weakest county was 1.97% of the leader's measure value; in the final year of the study, however, this value reached 5.61%. It was noteworthy that the lowest measure values were recorded during the periods of 2010–2012 in Kolno County, 2013–2019 in Kolbuszowa County, and 2020–2022 in Limanowa County.

An analysis of the $SDM_{quality}$ value was performed following the same assumptions as in the case of the previous SDM. A comparison for the first and last years of the analyzed period showed that positive changes could commonly be observed – the SDM value did indeed increase. Changes below the significance threshold were recorded in only 11 counties: Głogów County, Gdańsk County, the city of Gdynia (with county rights), Pszczyna County, Rybnik County, Wodzisław County, the city of Jastrzębie-Zdrój (county rights), the city of Tychy (county rights), the city of Żory (county rights), Police County, and the city of Świnoujście (county rights). On the positive side, the arithmetic mean of the $SDM_{quality}$ values steadily increased throughout the studied period – during the base year, this was 0.47, while during the last year, it equaled 0.63 (i.e., a 34% increase). At the same time, the increase in the number of counties that were included in the group that was characterized by the weakest level of activity raised concerns. An average level of activity was the dominating one (see Table 2).

Table 2. Classification of counties according to $SDM_{quality}$ values in 2010 and 2022

Specification	Number of counties	
	2010	2022
Class A – highest level of activity	67	64
Class B – high level of activity	118	122
Class C – medium level of activity	160	138
Class D – low level of activity	35	56

During the analyzed period, 14 counties took top-ten ranking positions based on the values of the discussed synthetic measure. Throughout the entire studied period, the leaders were as follows: Wrocław County, Legionowo County, Piaseczno

County, Warsaw West County, the capital city of Warsaw (with county rights), the city of Sopot (county rights), and Kołobrzeg County. In addition, the following counties were among the top-ten leaders during the periods that are presented in parentheses: the city of Wrocław (with county rights) (2019), the city of Rzeszów (county rights) (2020–2022), Puck County (2020–2022), Poznań County (2010–2019), Kamień County (2022), Police County (2010–2018), and the city of Świnoujście (county rights) (2010–2021).

The position of the ranking leader was shared among three counties: the city of Świnoujście (with county rights) (2010–2016), Warsaw West County (2017–2019), and Kołobrzeg County (2020–2022). The spatial distributions of the described measure are presented in Figures 3 and 4.

A comparison of the rankings from the beginning and end of the studied period allows one to conclude that 178 of the analyzed counties recorded declines, 192 recorded increases, and 10 maintained their rankings. There was some variation in the value of $SDM_{quality}$ in the analyzed counties; however, a clearly noticeable narrowing of the gap between the weakest county and the leader could be observed. During the base year, the analyzed measure value for the weakest county amounted to 9.49% of the leader's measure value, whereas this value was as high as 42.18% in the last studied year. It is worth noting the persistently low results for Chełm County throughout the entire period under study.

The correlation between the rankings that were assigned based on $SDM_{quality}$ and SDM_{volume} showed a moderate correlation. During the first year of the study, the value of the correlation coefficient was 0.36, and in the last year of the study, it was 0.39.

The correlation between the ranking positions that were assigned based on the number of residential premises that were sold in market transactions and $SDM_{quality}$ was strong – during the base year of the study, this was 0.61, and during the last year, it increased to 0.63. This meant that the highest number of transactions took place in those counties that were characterized by the best housing stocks.

The correlation between the rankings that were assigned based on the number of residential premises that were sold in market transactions and SDM_{volume} during the base year was moderate (the correlation coefficient was 0.55). In turn, the correlation increased to a strong level during the last year of the study but still remained at the lower end of the range, thus allowing for the conclusion of a strong correlation (coefficient value – 0.63). This meant that, although the activities of the real estate market participants depended on the stock volume, it cannot be concluded that those counties with smaller housing stocks recorded no interest in it at the same time.

A comparison of the number of transactions during the first and last years of the study showed that the greatest increases (exceeding 1000%) were recorded in the following counties: Zgorzelec County (10,350%), Sochaczew County (7300%), Garwolin County (5025%), Kępno County (4000%), the city of Rzeszów (3050%),

Kościan County (2850%), Kolbuszowa County (2300%), Dąbrowa County (2266%), Konin County (1820%), Pabianice County (1695%), Janów County (1567%), Sławno County (1475%), the city of Rybnik (1323%), the city of Świnoujście (1197%), Chrzanów County (1166%), Kłobuck County (1125%), Wodzisław County (1119%), Oława County (1042%) and Leszno County (1034%).

Negative values (decreases in the numbers of transactions) were recorded in 26 counties; interestingly, this situation occurred in four cities with county rights: Sopot, Katowice, Szczecin, and Koszalin. Declines in the numbers of transactions above 20% could be observed in only 12 of the analyzed units (the respective declines are presented in parentheses): Sucha County (−21%), Żuromin County (−23%), Nidzica County (−25%), Krosno County (−32%), Wołów County (−32%), Sopot Urban County (−136%), Katowice Urban County (−434%), Wałbrzych County (−546%), the city of Szczecin (−1594%), and Piaseczno County (−2088%). No transactions were recorded in the city of Koszalin (with county rights) nor in Skierniewice County.

For as many as 26 counties, the percentage growth could not be calculated, as the number of transactions for each was zero during the base year; this referred to the following counties: Grodzisk (Wielkopolskie Voivodeship), Ostrów Wielkopolski, Grójec, Drawsko, Sokołów, Radzyń, Jędrzejów, Lubliniec, Rybnik, Włocławek, Ostrów Mazowiecka, Bielsko, Płock, Parczew, Hajnówka, Kielce, Łosice, Bielsk, Siemiatycze, Maków, Białobrzegi, Zwoleńsk, Kazimierza, Tarnów, Lipsk, and Ostrołęka. Tatra and Kozienice counties recorded the same numbers of transactions during the first and last years of the analysis (231 and 84, respectively), and the remaining counties noted increases in their numbers of transactions.

The analysis of the number of residential premises that were sold within the framework of market transactions showed a great diversification among the counties. The sums of the transactions from the period of 2010–2022 indicated three leaders: the capital city of Warsaw (with county rights) (240,000 transactions), the city of Krakow (144,000 transactions), and the city of Wrocław (136,000 transactions). A comparison of the numbers of transactions during the first and last years of the study for the aforementioned cities presented the following increases: 131, 91, and 66%, respectively. Taking into account that the fourth unit in terms of the numbers of residential premises that were sold under market transactions during the analyzed period was the city of Gdańsk (with county rights) (92,000 transactions). This was characterized by an increase of 576%, which meant that changes among the leaders could have been expected.

This was counterbalanced by those counties that were characterized by the lowest numbers of transactions: Lipsko County (99 transactions), Skierniewice County (36 transactions), and Ostrołęka County (26 transactions). Only 36 counties (including the leaders) recorded more than 10,000 transactions, and fewer than 1000 transactions were recorded in as many as 111 counties (see Figs. 5 and 6 – the natural division of Jenks was used in each figure).

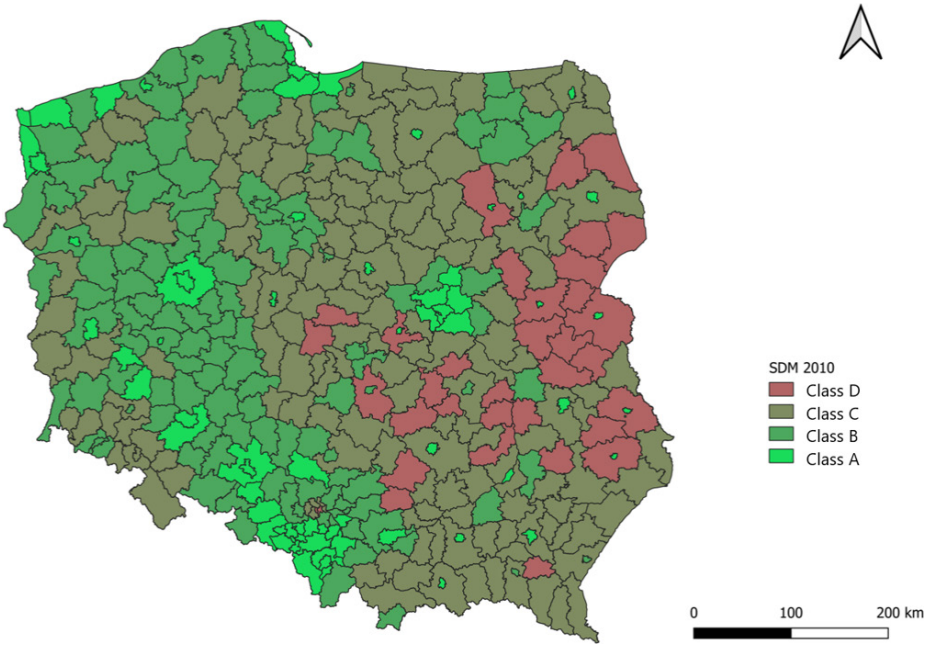

Fig. 3. $SDM_{quality}$ data for counties – 2010

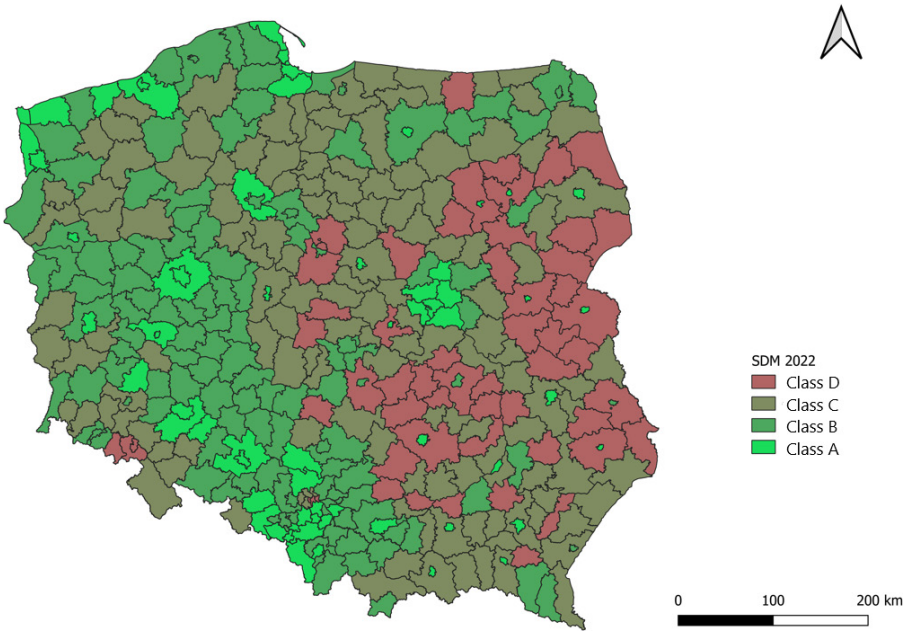

Fig. 4. $SDM_{quality}$ data for counties – 2022

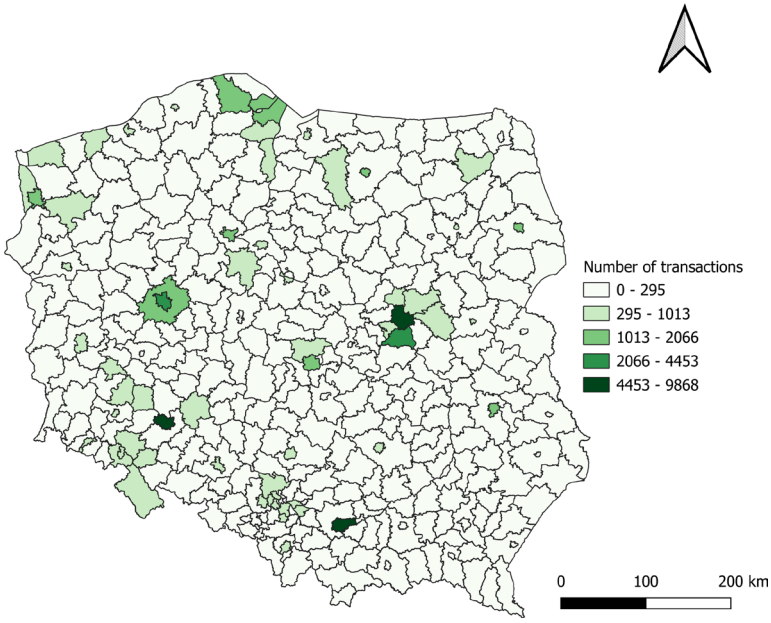

Fig. 5. Numbers of residential premises that were sold in market transactions – data for counties in 2010

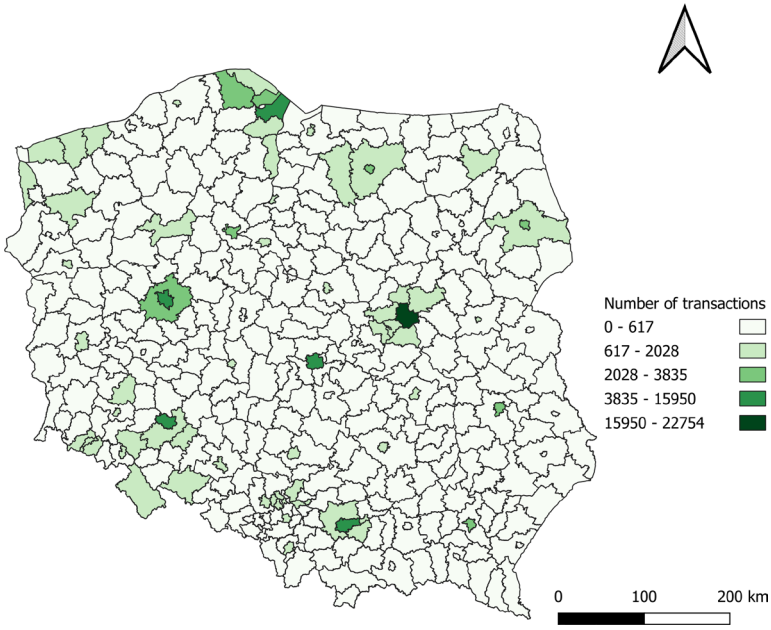

Fig. 6. Numbers of residential premises that were sold in market transactions – data for counties in 2022

3.2. Flipping – Attempt to Define Phenomenon

The word "flipper" has been functioning in Polish language for a long time; in recent years, it has taken on a completely new meaning that is relevant to the real estate market. The word once meant slot machines (including gambling machines); currently, however, "flipper" and "flipping" are associated with fast and profitable real estate transactions. From the viewpoint of the nature of professional activity, a flipper appears to be an entity (it can be a natural or a legal person) who combines the skills of a real estate broker, a real estate consultant, and a real estate manager. However, it should be noted that the occupations of broker and manager lost their statuses as regulated professions on January 1, 2014, whereas the job of a consultant has never held this status in Poland.

In Polish source literature on real estate, there are still only few publications that have discussed the issue in question. A library query also indicated a poor selection and ambiguous definitions of the aforementioned concepts in the foreign literature. According to the praxeological proposal that was adopted in the study by C.A. Depken, H. Hollans, and S. Swidler, flipping means two transactions that involve the same residential property that are concluded no more than two years apart [11]. It is debatable whether, under real estate market conditions, a period of two years meets the "quick resale" criterion; this is relevant in the context of the U.S. real estate market, for example, where investors who buy properties cheaply with the intention of quick and profitable resales are referred to as flippers [12].

A broader definition of flippers was formulated by Bayer and his co-authors – they noted that flippers not only purchased properties without the intention of living in them or renting them out but rather for quick resale only. They also perform additional functions in the real estate market; these include the following:

- acting as intermediary who holds property in investment portfolio until suitable final buyer is found;
- acting as investor who is making significant renovations to property;
- playing role of speculator who is taking advantage of difficult access to information, a non-transparent real estate market, and (in extreme cases) even gullibility of unprofessional market participants [13].

The essence of flipping is clarified by the definition of a flipper's goal – i.e., to purchase a property at a price lower than its market value, make it attractive to a potential buyer, and sell it quickly (best within 6–18 weeks of its acquisition) at the highest possible price. Due to the nature of the flipper's main activity, their transactions (known as flips) can be divided into three categories:

1) renovation and remodeling of property,
2) improving visual attractiveness of property,
3) sorting out legal status of property [14].

It is worth noting that the goal being formulated in this way differs significantly in the flipper's period of operation as compared to the praxeological proposal that was offered by Depken's team. However, the emphasis in a flipper's objective on the need for a dynamic approach to real estate investment should be considered to be important. Therefore, a flipper requires knowledge, experience, and project-management skills. It follows that the key element of success is the ability to analyze the market accurately, anticipate trends, and manage budgets and resources effectively.

Keeping the nature of the phenomenon of flipping in mind, it is worth looking at how practitioners define it and what definition is offered to the general public (society). It is widely believed that flippers represent people who purchase properties at bargain prices (low, or even discounted) in order to sell them for profit. An emphasis is placed on the conviction that a flipper must be a great negotiator and salesman. What raises concerns, however, are clear indications that not every flipper acts transparently with the party to a transaction in the sense that they do not disclose their profession; instead, they present untrue stories that explain the reasons for the purchase or sale of the property [15]. This may be one of the reasons that facilitates the imposition of the "evil flipper" narrative. The mass media repeatedly presents information that flippers are to blame for rising real estate prices or unfair competition against ordinary buyers [16].

4. Discussion

On the basis of the obtained results, it can be concluded that increases in housing stocks have been observed in all Polish counties. This is apparently positive; however, the analysis of the locations that featured the strongest growths indicated the domination of the largest cities (which, however, encourages a deeper reflection when assessing the studied phenomenon). The source literature has repeatedly addressed the issue of the concentrations of important economic, administrative, and social (thus, settlement) functions in the largest urban centers. Unfortunately, uncontrolled concentrations opens a straight path toward increasing the polarization of development [17–20]. Naturally, the largest centers have been, are, and will continue to be the engines of regional development [21]. However, the densities of the housing potentials in the cities' adjacent areas should be approached with great caution [22–24], and any assessment of the analyzed phenomenon should be combined with the levels of regional development in individual areas of Poland, the spatial redistributions of the populations, and the regions' potentials being "sucked out" by their centers [25]. The literature clearly raises the problem of the uneven development of Polish regions, points to depopulation processes that are currently occurring (and will only intensify in the future), and the problem of population aging [26–27]. It is therefore worth taking a closer look at the housing stock in this context as well – especially since real estate (unlike populations) cannot move around.

It is true that the housing stocks of Polish counties are not a monolith – they vary both in terms of quantity and quality. This can be accessed through the prism of their wide selection for the consumer. A positive observation was that the distance between the weakest county and the leader in terms of $SDM_{quality}$ is declined during the period under study. The analysis of the $SDM_{quality}$ values indicated that positive changes could be observed in the weakest counties; i.e., the quality of the housing stocks increased. The number of market transactions that involved residential premises was also highly diversified – both in spatial and temporal terms within the same county.

When considering market transactions, it is difficult to ignore the issue of prices. The prices on the Polish real estate market stir up emotions [28]. Being accused of contributing to price increases, flipping is a difficult-to-measure phenomenon, and problems have already been encountered at the definition stage.

This is currently a buzzword that appears frequently in the media – one could even risk stating that it is quite trendy. It is worth noting that, from the perspective of flipping, low-quality housing stock is even desirable; this is because the premises can then be renovated. This is quite different from the standard perception of quality on the property market – after all, low-quality stock is unattractive for an ordinary customer. Even though it has not been clearly defined, flipping has even become a subject of interest for the Bureau of Parliamentary Studies. The publication of the aforementioned publisher presented the results that have been assessed by the authors of this text as "worrisome"; they highlighted that the flipping activities in Polish cities had increased in recent years and that, today, approx. 6% of all sales transactions in the residential market referred to flipping transactions (with some locations even reaching double-digit values; e.g., Katowice, Bydgoszcz) [14]. The foreign literature points to an interesting issue; namely, the nature of flipping means that it is most often associated with hot real estate markets. In fact, it turns out that that this also occurs in so-called "cold markets" [29]; it is worth asking whether this offers opportunities to revive these markets in such a case. After all, there happen to be many Polish counties where their real estate markets are in need of revival. Hence, can any positive features of flipping be identified?

When discussing the phenomenon under study, the issue of housing policy (understood as a microeconomic policy that is carried out by the state administration and local government units) cannot be disregarded [30]. As a result, it should be expected that the state can (and ought to) influence the housing stock. Whether flipping should be curtailed as part of this influence remains an open question. The question is all the more pertinent, because how is one to limit something that is even difficult to define at the level of theoretical considerations?

To summarize the discussion, it is worth emphasizing the need for taking environmental and social aspects into account when planning new residential developments, as environmental services undoubtedly influence the values of real estate markets [31–32]. Is important to develop an infrastructure in such a way that allows

residents to live comfortably and sustainably – especially in the context of climate change [33–35] and noise pollution [36]. This is all the more important as the awareness that has been presented by Polish real estate consumers is growing; they are beginning to recognize the environmental features in their places of residence [37].

5. Conclusions

The research results allowed for defining the housing stocks of Polish counties as being diversified – both in terms of quality and size. The distance between the leader and the weakest county was huge; in both cases, the extreme classes (i.e., the lowest and highest levels of activity) are noted in the smallest numbers of counties. It is positive that changes are being observed in the weakest counties; i.e., the housing stocks are improving, although the pace can hardly be considered to be impressive. The largest cities with county rights are, obviously, the dominant ones; it is not so much the strong volume growth of the analyzed resources in the metropolitan areas that should be worthy of monitoring but also the so-called ring municipalities in their vicinities.

The analysis of the number of market transactions showed significant recoveries of the markets in some counties (where single transactions were literally recorded at the beginning of the analyzed period). In Zgorzelec County, for example, only four transactions were recorded in 2010, whereas as many as 418 transactions had occurred in 2022; this was an impressive increase of more than 10,000%. This proved that, even in a market with very little activity, a dramatic change can take place within a decade or so. In turn, significant declines in the numbers of transactions could be observed in seemingly very attractive and stable (in terms of growth) markets. This situation occurred in the following counties (the values of the decreases are given in parentheses): the city of Sopot (–136%), the city of Katowice (–434%), and Piaseczno County (–2088%). This meant that the drops in the numbers of transactions affected those locations that were characterized by a developed tourist function (e.g., the city of Sopot), being part of one of the major agglomerations (e.g., the city of Katowice), or those that neighbor the capital city (e.g., Piaseczno County).

The research results clearly indicated the volatility of the real estate market; in a natural way, such characteristics make it attractive to flippers. Whether or not the phenomenon of flipping is negative remains; in the opinion of the authors, this is an open question. It can only be said that flipping is present on the Polish real estate market and has become the subject of interest of various social groups.

The authors recognize that, given the relevance of the addressed research problem, it will be worthwhile to make assessments that are based on a division into primary and secondary markets in future studies. The peculiarities of the secondary market also prompted us to look at the technical conditions of buildings, for example, in terms of the years of construction or general renovation.

Funding

This work was supported by the own funds of the Wrocław University of Environmental and Live Sciences. This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

CRediT Author Contribution

A. K. D.: conceptualization, methodology, validation, formal analysis, investigation, resources, writing – original draft preparation, writing – review and editing.

M. H.: data curation, formal analysis, literature review.

S. S. K. K.: visualization, literature review.

K. P.: data curation, formal analysis, literature review.

Declaration of Competing Interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work that is reported in this paper.

Data Availability

All of the research and analysis results that are included in the article have been published in the body of the article.

Use of Generative AI and AI-Assisted Technologies

No generative AI or AI-assisted technologies were employed in the preparation of this manuscript.

References

[1] Local Data Bank of Statistics Poland. https://bdl.stat.gov.pl/bdl/start [access: 15.05.2024].

[2] Keivani R., Werna E.: *Modes of housing provision in developing countries.* Progress in Planning, vol. 55(2), 2001, pp. 65–118. https://doi.org/10.1016/S0305-9006(00)00022-2.

[3] Boardman M.: *Fixing and Flipping Real Estate: Strategies for the Post-Boom Era*. Apress, Berkeley 2013. https://doi.org/10.1007/978-1-4302-4645-9.

[4] Li L., Yavas A., Zhu B.: *Externalities of residential property flipping*. Real Estate Economics, vol. 51(1), 2023, pp. 233–271. https://doi.org/10.1111/1540-6229.12413.

[5] Abrutyn E., Eapen S.M.: *Claims against professionals arising from real estate flipping schemes*. Defense Counsel Journal, vol. 76(1), 2009, pp. 109–134.

[6] Lindstrom H.D.: *Property flipping as neighborhood destablization versus short term real estate investment (STREI) as community reinvestment: A case study of Buffalo, NY*. State University of New York at Buffalo ProQuest Dissertations & Theses, 1444023, ProQuest Information and Learning Company, Ann Arbor 2007.

[7] Kowalewski G.: *Metody porządkowania liniowego*, [in:] Dziechciarz J. (red.), *Ekonometria: metody, przykłady, zadania*, Wydawnictwo Akademii Ekonomicznej im. Oskara Langego, Wrocław 2002, pp. 287–304.
[8] Myers L., Sirois M.J.: *Spearman correlation coefficients, differences between*, [in:] Kotz S., Read C.B., Balakrishnan N., Vidakovic B., Johnson N.L. (eds.), *Encyclopedia of Statistical Sciences*, vol. 12, Wiley, Hoboken 2006, pp. 7901–1903. https://doi.org/10.1002/0471667196.ess5050.pub2.
[9] Bao Z., Lin L.Ch., Pan G., Zhou W.: *Spectral statistics of large dimensional Spearman's rank correlation matrix and its application.* The Annals of Statistics, vol. 43(6), 2015, pp. 2588–2623. https://doi.org/10.1214/15-AOS1353.
[10] Sobczyk M.: *Statystyka opisowa.* Wydawnictwo C. H. Beck, Warszawa 2010.
[11] Depken C.A., Hollans H., Swidler S.: *An empirical analysis of residential property flipping*. The Journal of Real Estate Finance and Economics, vol. 39(3), 2009, pp. 248–263. https://doi.org/10.1007/s11146-009-9181-3.
[12] Leung C.K.Y., Tse C.-Y.: *Flipping in the housing market*. Journal of Economic Dynamics and Control, vol. 76, 2017, pp. 232–263. https://doi.org/10.1016/j.jedc.2017.01.003.
[13] Bayer P., Geisller Ch., Roberts J.W.: *Speculators and Middlemen: The Role of Flippers in the Housing Market*. National Bureau of Economic Research, Washington, DC, USA 2011.
[14] Czerniak A., Milewska-Wilk H., Bojęć T.: *Zjawisko flippingu na polskim rynku mieszkaniowym* [*Flipping on the Polish housing market*]. Studia BAS, nr 2(66), 2021, pp. 195–213. https://doi.org/10.31268/StudiaBAS.2021.23.
[15] Kup Sprzedaj Wynajmij: *Kim są flipperzy? Kto to jest flipper? Jak działa?* https://www.kupsprzedajwynajmij.pl/kim-sa-flipperzy-kto-to-jest-flipper-jak-dziala/ [access: 12.05.2024].
[16] Zaręba A.: *Spowiedź flippera. „Zarabiam 100 tys. zł na jednym mieszkaniu"* [interview with M. Stężały]. Radio ZET – Wiadomości, 2.12.2022. https://wiadomosci.radiozet.pl/Biznes/spowiedz-flippera-zarabiam-100-tys-zl-na-jednym-mieszkaniu [access: 08.06.2024].
[17] Heffner K.: *Aglomeracje średniej wielkości jako bieguny wzrostu i obszary strategicznej interwencji w regionach międzymetropolitalnych* [*Medium-sized urban agglomerations as a growth poles and the areas of strategic intervention in the inter-metropolitan regions*], [in:] Makieła Z. (red.), *Potencjalne metropolie ze szczególnym uwzględnieniem Polski wschodniej*, Studia – Polska Akademia Nauk. Komitet Przestrzennego Zagospodarowania Kraju, t. 125, Komitet Przestrzennego Zagospodarowania Kraju PAN, Warszawa 2009, pp. 10–17.
[18] Heffner K.: *Regiony międzymetropolitalne a efekty polityki spójności w Polsce* [*Inter-metropolitan regions and the effects of cohesion policy in Poland*], [in:] Klamut M., Szostak E. (red.), *Jaka polityka spójności po roku 2013?*, Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu, nr 95, Wydawnictwo Uniwersytetu Ekonomicznego we Wrocławiu, Wrocław 2010, pp. 163–184.

[19] Heffner K., Gibas P.: *Regiony słabiej rozwinięte a efekty polityki spójności w Polsce* [*Lesser developed regions and cohesion policy effects in Poland*], [in:] Pancer-Cybulskia E., Szostak E. (red.), *Polityka spójności w okresie 2013–2020 a rozwój regionów Europy*, Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu, nr 227, Wydawnictwo Uniwersytetu Ekonomicznego we Wrocławiu, Wrocław 2011, pp. 36–52.

[20] Korcelli P.: *System osadniczy Polski – tendencje i uwarunkowania przemian* [*The settlement system of Poland: trends and factors of change*], [in:] Markowski T. (red.), *Koncepcja przestrzennego zagospodarowania kraju a wizje i perspektywy rozwoju przestrzennego Europy* [*The Polish spatial development concept versus European visions of spatial development perspectives*], Studia – Polska Akademia Nauk. Komitet Przestrzennego Zagospodarowania Kraju, t. 122, Komitet Przestrzennego Zagospodarowania Kraju PAN, Warszawa 2008, pp. 30–42.

[21] Dadashpoor H., Doorudinia A., Meshkini A.: *Polycentricity: The last episodes or the new season?*, Progress in Planning, vol. 177, 2023, 100776. https://doi.org/10.1016/j.progress.2023.100776.

[22] Gibas P., Heffner K.: *Społeczne i ekonomiczne koszty bezładu przestrzeni – osadnictwo obszarów wiejskich* [*Social and economic costs of spatial chaos – settlement of rural areas*]. Studia Komitetu Przestrzennego Zagospodarowania Kraju PAN, vol. 182(2), 2018, pp. 163–195.

[23] Sharifi A., Khavarian-Garmsir A., Allam Z., Asadzadeh A.: *Progress and prospects in planning: A bibliometric review of literature in Urban Studies and Regional and Urban Planning 1956–2022*. Progress in Planning, vol. 173, 2023, 100740. https://doi.org/10.1016/j.progress.2023.100740.

[24] Burchfield M., Overman H.G., Puga D., Turner M.A.: *Causes of sprawl: A portrait from space.* The Quarterly Journal of Economics, vol. 121(2), 2006, pp. 587–633. https://doi.org/10.1162/qjec.2006.121.2.587.

[25] Wlaźlak K.: *Rozwój regionalny jako zadanie administracji publicznej*. Wolters Kluwer Polska, Warszawa 2021.

[26] Śleszyński P.: *Demograficzne wyzwania rozwoju regionalnego Polski* [*Demographic challenges of regional development of Poland*]. Studia Komitetu Przestrzennego Zagospodarowania Kraju PAN, vol. 183, 2018, pp. 225–247.

[27] Hełdak M., Kulczyk-Dynowska A., Przybyła K., Stacherzak A., Szczepański J., Michalik M., Płuciennik M., Kempa O.: *Standards and the demand for adapting apartments for better accessibility for older adults in Poland*. Journal of Housing and the Built Environment, vol. 39(4), 2024, pp. 937–956. https://doi.org/10.1007/s10901-023-10048-8.

[28] Zbyrowski R.: *Przyczynowość cen na rynku nieruchomości w Polsce* [*Price causality in the real estate market in Poland*]. Metody Ilościowe w Badaniach Ekonomicznych, t. 23(3), 2022, pp. 67–77. https://doi.org/10.22630/MIBE.2022.23.3.7.

[29] Anacker K.B., Schintler L.A.: *Flip that house: Visualising and analysing potential real estate property flipping transactions in a cold local housing market in the United States*. International Journal of Housing Policy, vol. 15(3), 2015, pp. 285–303. https://doi.org/10.1080/14616718.2015.1051401.

[30] Kisiel R., Zielińska-Szczepkowska J., Dzieżyk K.: *Potrzeby mieszkaniowe a prowadzona polityka mieszkaniowa w Polsce – wyniki badań ankietowych* [*Housing Policy in Poland*]. Studia Prawno-Ekonomiczne, t. 118, 2021, pp. 227–247. https://doi.org/10.26485/SPE/2021/118/12.

[31] Christensen P., Keiser D.A., Lade G.E.: *Economic effects of environmental crises: Evidence from Flint, Michigan*. American Economic Journal Economic Policy, vol. 15(1), 2023, pp. 196–232. https://doi.org/10.1257/pol.20190391.

[32] Chang K.-F., Chou P.-Ch.: *Measuring the influence of the greening design of the building environment on the urban real estate market in Taiwan*. Building and Environment, vol. 45(10), 2010, pp. 2057–2067. https://doi.org/10.1016/j.buildenv.2010.02.013.

[33] Bal-Domańska B.: *Ocena zrównoważonego rozwoju Polski w układzie powiatów w ujęciu przyczyna – stan – reakcja. Przypadek bezrobocie – ubóstwo – aktywność gospodarcza* [*The evaluation of sustainable development in the system of counties in Poland from the pressure – state – response perspective. Example of unemployment – poverty – economic activity*], [in:] Markowska M., Głuszczuk D., Bal-Domańska B. (red.), *Gospodarka regionalna i teorii i praktyce*, Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu, nr 433, Wydawnictwo Uniwersytetu Ekonomicznego we Wrocławiu, Wrocław 2016, pp. 9–18.

[34] Furmankiewicz M., Bochenkiewicz M.: *Renewable energy and community-led local development in Poland: Do rural communities take measures to combat climate change?*, [in:] Goev V., Zarotiadis G. (eds.), *Proceedings of the 15th International Conference of ASECU Sustainable Development Goals 2030: Challenges for South and Eastern European Countries and the Black Sea Region September 26–27, 2019 Sofia, Bulgaria*, UNWE Publishing Complex, Sofia 2019, pp. 212–221.

[35] Piepiora Z.: *Występowanie katastrof naturalnych na obszarze Polski i przeciwdziałanie ich skutkom* [*Natural disasters in Poland and counteraction for their damages*]. Biblioteka Regionalisty, nr 10, 2010, pp. 153–173.

[36] Chrobak G., Aslanoğlu R., Lubańska A., Kowalczyk T., Tokarczyk-Dorociak K., Szewrański S., Kazak J.K.: *Graph enhanced co-occurrence: deep dive into urban park soundscape.* Ecological Indicators, vol. 165, 2024, 112172. https://doi.org/10.1016/j.ecolind.2024.112172.

[37] Źróbek S., Trojanek M., Źróbek-Sokolnik A., Trojanek R.: *The influence of environmental factors on property buyers' choice of residential location in Poland*. Journal of International Studies, vol. 8(3), 2015, pp. 164–174.