



Housing Market in Central European City during the COVID-19 Pandemic

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Abstract: *Many aspects of the global economy changed during the Covid-19 pandemic, including the real estate market. This study examines the primary residential property market in Opole during the Covid-19 pandemic. It uses property transaction data from 2018 to 2021 to conduct statistical analyses and independent group tests and also takes into account the real-estate price trend from 2014 to 2020. The study finds that both property prices and preferences relating to the structure and location of housing changed during the pandemic. In the case of Opole, the number of transactions involving residential units in the primary market increased in 2020 compared to previous years. After adjusting the unit price value of residential properties for the trend in the pre-pandemic period, the study finds that there was also an increase in property transaction prices. The study confirms three important facts relating to phenomena that are occurring globally in cities today. First, local communities are more diverse in terms of the economic heterogeneity of real estate buyers. Second, unlike big urban areas, small cities may be more resistant to the process of citizens migrating to suburban areas, thereby limiting the negative phenomenon of urban sprawl. Third, the housing real estate market in small cities is considered a reliable form of investment of assets, as real estate prices increased during the Covid-19 pandemic.*

Keywords: housing market; primary market; Covid-19; price trend.



Introduction

Many aspects of how socio-economic systems function changed during the Covid-19 pandemic, including the real estate market. Every country that was to a greater or lesser degree affected by the Covid-19 pandemic tried to counteract the effects of the pandemic situation. The lockdowns resulted in changes in employment sectors and limited opportunities for foreign investors. However, both price and demand are dependent on a number of factors that were affected by the global health crisis caused by the Covid-19 pandemic. Therefore, national governments introduced aid packages to counteract the impact of the pandemic, while National Banks cut interest rates. Based on the example of Turkey, Tanrıvermiş (2020) found that the share of real estate-related activities remained relatively stable during the pandemic: while, despite previous upward trends, there was a significant drop in real estate sales in March 2020, sales had already become stable again in the months that followed as a result of a decrease in housing loan rates. Other studies from the region indicate that this resulted in an increase in demand and housing prices in the short term (Ahsan and Sadak 2021). Similar studies were conducted around the world in order to analyse the impact of Covid-19 on real estate. Researchers considered the situation in Asia (Cheung et al. 2021; Sethi and Mittal 2020), Africa (Mohamed Elnaggar and Elhegazy 2022), Australia (Hu et al. 2021), America (Li and Zhang 2021), and Europe (De Toro et al. 2021; Del Giudice et al. 2020).

Studies conducted in Poland show that this situation may differ also between cities, which minimise the impact of different policy to deal with pandemic conditions. The results of research conducted on four major cities in Poland do not indicate a clear trend. The impact of Covid-19 on property prices was expected to decrease as a result of a decline in demand. However, the research strongly contradicts this assumption. The main reason cited for this is again the decrease in interest rates, which resulted in greater mortgage affordability/which made mortgages much more affordable. Conclusions drawn from the research indicate that there is consistently an upward trend in housing prices, indicating that Covid-19 has done nothing to halt this, which is unusual compared to what happened in other markets. In addition, it is predicted that two out of the four cities surveyed will see a continuous increase and the other two a steady decline (Belej 2021). Another study on Warsaw shows a slight upward trend in prices (1.2%) and a more significant decline in long-term rents (-7.7%) (Trojanek et al. 2021). This is consistent with the situation in the primary real estate market, where the impact of the pandemic has been found to be limited, and the monopolistic competition of developers has been identified as the main factor mitigating the steep price declines. In Warsaw, as in the case of other cities that have been studied, the impact was influenced by record low interest rates, which, despite the reduction in demand for housing, did not result in COVID-19 having a negative effect (Augustyniak et al. 2021). However, most of the studies were concentrated on the biggest cities, as they seem to be the most interesting research objects, while smaller regional cities and towns remain un-investigated. The aim of this research was to analyse the situation of the housing market during the COVID-19 pandemic in Opole (Poland), which is one of the smallest regional cities in Poland. With a population of approximately 125,000 people, it can be classified as a small urban area according to the definition proposed by the Organisation for Economic Cooperation and Development (OECD 2022).



Characteristics of apartment transactions in 2018-2021

The study used data on apartment transactions in the primary market (sold directly by real estate developers) during the period 2018-2021. The descriptive statistics of the unit price [PLN] per square metre for each year in the research period (Table 1) indicate an increasing trend and high variation in the unit real estate price. The number of transactions was comparable over time (except in 2020) and amounted to just over 600 per year. In the year the pandemic started (2020), the number of transactions was 59% higher than in the previous year (2019) and the number returned to the pre-pandemic level in 2021.

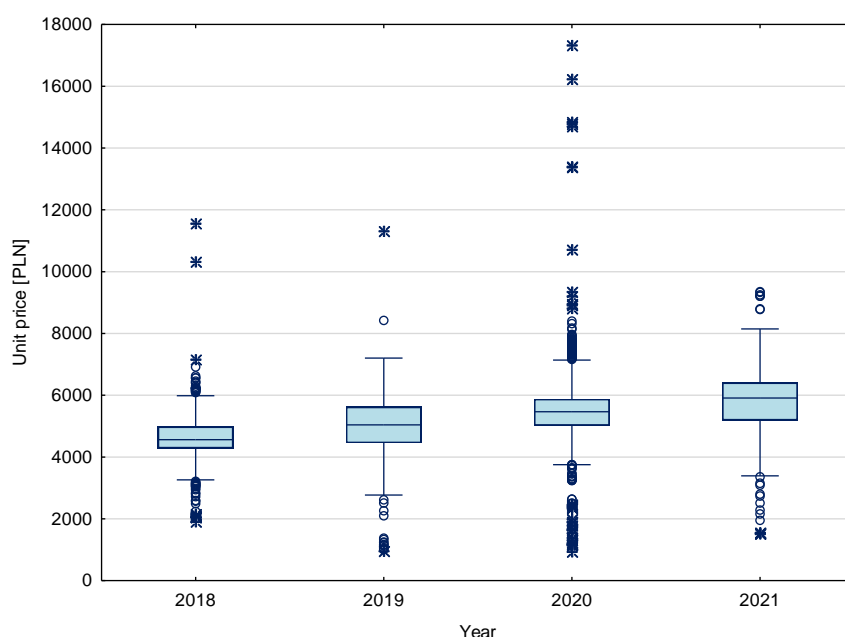
Table 1: Descriptive statistics of real estate transactions involving apartments [PLN/m²]

Year	N	Mean	Median	Min.	Max.	Stand. dev.
2018	610	4648.4	4564.0	1911.6	11559.0	888.3
2019	635	4999.1	5043.3	952.6	11303.2	1000.8
2020	1009	5469.3	5470.0	923.5	28725.0	1551.7
2021	600	5791.7	5912.6	1512.6	9344.6	1071.7

Note: N – number of transactions.

Source: Author's calculations based on housing market data.

Figure 1: Box-plots for the unit price [PLN] each year



Note: The highest value, 28 725.0, was excluded to increase readability.

Source: Author's calculations based on housing market data.

The highest unit prices were recorded among apartments with a maximum area of 30 m²; the only exception to this was the case of a residential property with an area of 75.2 m² located in the centre of the city that had the highest price per square metre in 2019 and was also the most expensive residential transaction (PLN 850,000) in 2019. Nine of the transactions with the highest unit price that were observed in the entire research period took place in 2020 and related



to apartments/dwellings with an area of no more than 25 m²; they were all located in the same building, very close to the Kamionka Piast water reservoir. The highest standard deviation, observed in 2020, is the result of these nine transactions with unusually high unit prices. The year 2020 also saw the most (302) transactions with unusually high (137) and unusually low (165) unit prices (Figure 1). The increase in the value of average unit prices in the ensuing years is clearly noticeable.

Removing the pre-pandemic price trend

The next step of the research was to remove the price trend that characterised the situation in the real estate market before the pandemic. Considering that the socio-economic development of Eastern EU Member States is significantly stimulated by European funds, and that the long-term budget of the European Union is creating uniform conditions. The 2014-2020 was used as the reference period in our analysis. Therefore, for the purpose of price trend removal, we obtained the average unit prices per square metre of dwellings in the period 2014-2019. The designated trend is an increasing trend with a slope equal to PLN 149.57. Thus, the unit prices of real estate from 2020 and 2021 were reduced by PLN 149.57 and PLN 299.14, respectively. Then the period *Before* the pandemic, from 1 January 2018 to 29 February 2020, and the *During* period, from 1 March 2020 to the end of 2021, were defined. Despite the elimination of the trend, significantly higher unit prices of real estate were observed during the pandemic than before it (Table 2).

Table 2: Descriptive statistics of price [PLN] per square metre Before and During the Covid-19 pandemic after the price trend was removed

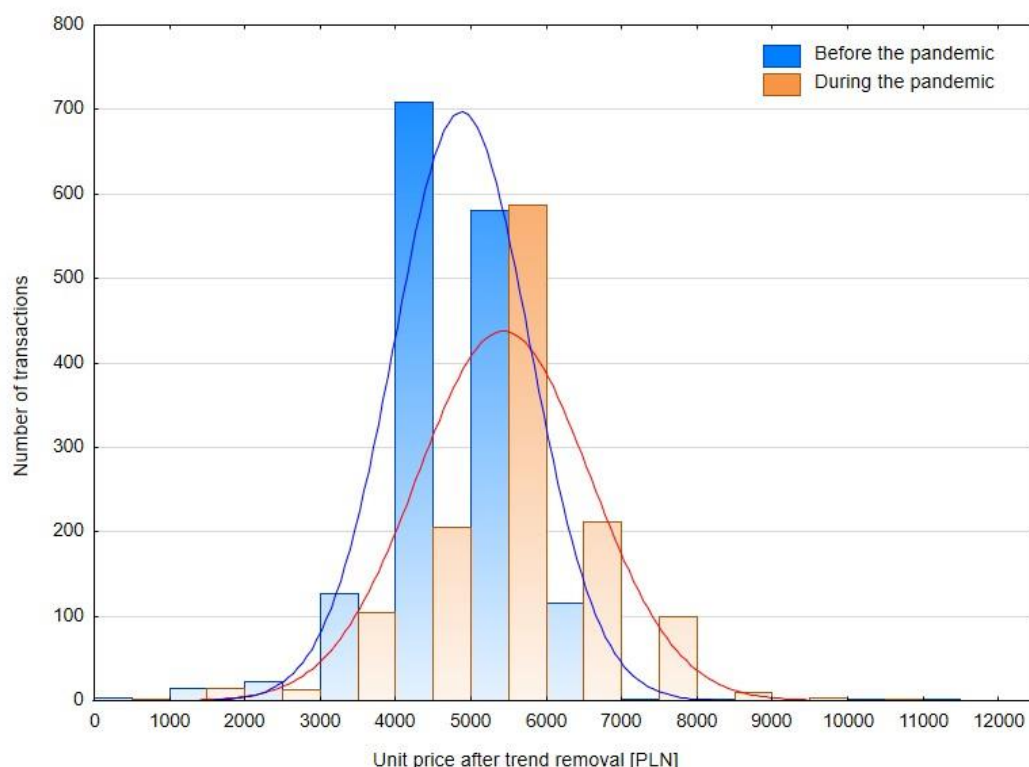
Period	N	Mean	Median	Min.	Max.	Stand. dev.
Before	1577	4880.4	4916.3	773.9	11559.0	904.3
During	1259	5509.8	5495.6	952.6	28757.4	1498.9

Note: N – number of transactions.

Source: Author's calculations based on housing market data.



Figure 2: A histogram of unit prices *Before* and *During* the pandemic excluding 9 the most expensive transactions from 2020



Source: Author's calculations based on housing market data.

In the post-pandemic period, there was a clear shift of the price distribution (Figure 2) to the right – towards higher values. During the pandemic, there were approximately twice as many transactions with a unit price in the range of PLN 6000–7000/m² and 99 transactions (compared to 2 before the pandemic) with a price in the range of PLN 7000–8000/m². The parameters of the theoretical distribution were adjusted to the empirical ones. Neither the theoretical nor the empirical case, however, can be considered on statistically significant grounds to be consistent with normal distribution, and raw data confirm that the real estate market changed during the pandemic as the unit value/unit prices of apartments became more varied.

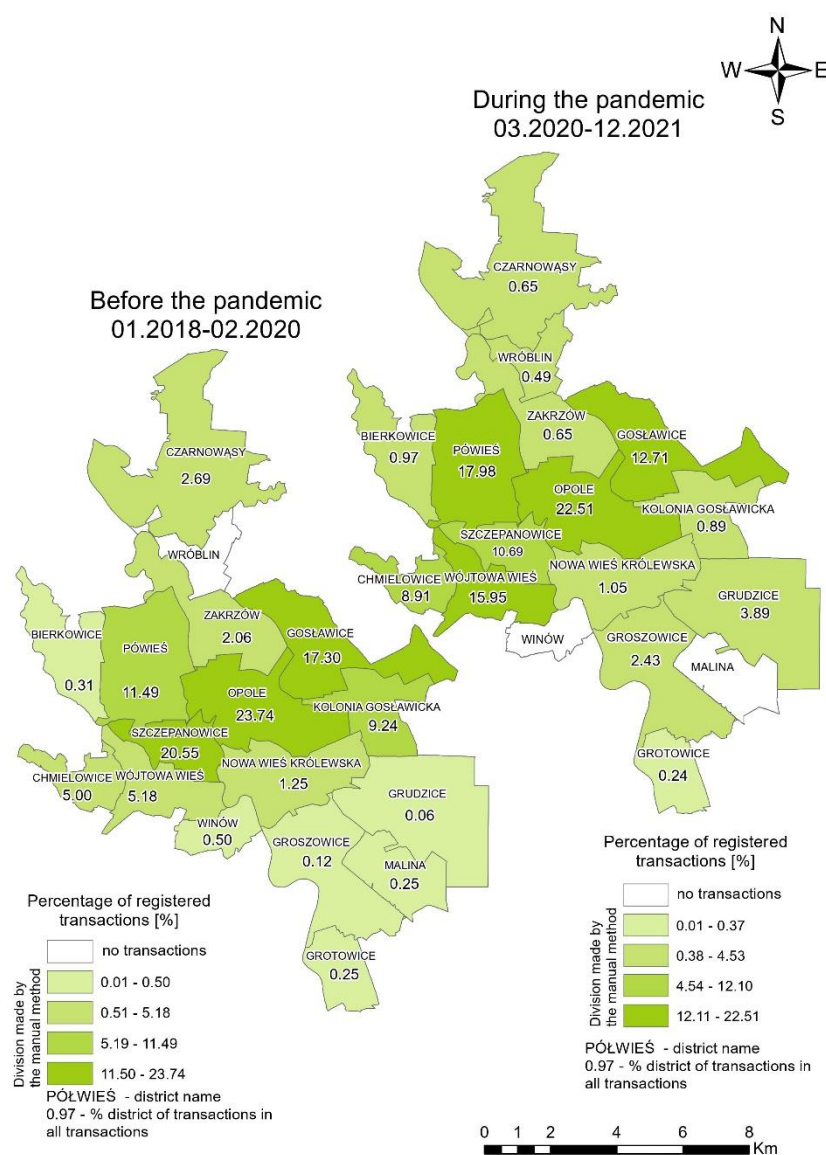
These unit prices attest to a more general feature of real estate markets in small cities. The real estate market has become more diverse and has begun offering apartments with a wider range of prices. Given that the research did not focus on the offer prices but on real transactions, it can be assumed that buyers have also become more socially diverse and, therefore, the local community in the city has become more economically heterogeneous. This can be proved with data based on the relative standard deviation (a ratio of standard deviation and the mean), which measures the level of dispersion. For transactions before the pandemic, the relative standard deviation was 18.5%, while during the pandemic period it rose to 27.2%.



Assessing the real estate market during the Covid-19 pandemic

As well as the change in the number of transactions, there are also some differences in their spatial distribution (Figure 3–4). The share of transactions in the central district of the city decreased by 1.2%, but this district remained a major area of purchase and sale agreements (accounting for 23.7% of real estate transactions in the city before the pandemic and 22.5% during the pandemic). Similarly, most of the districts surrounding the city's central one saw decreases in their share of the total transactions in the city, while only one surrounding district saw an increase in their share of transactions. Most of the increases in transactions were observed in locations more remote from the city centre.

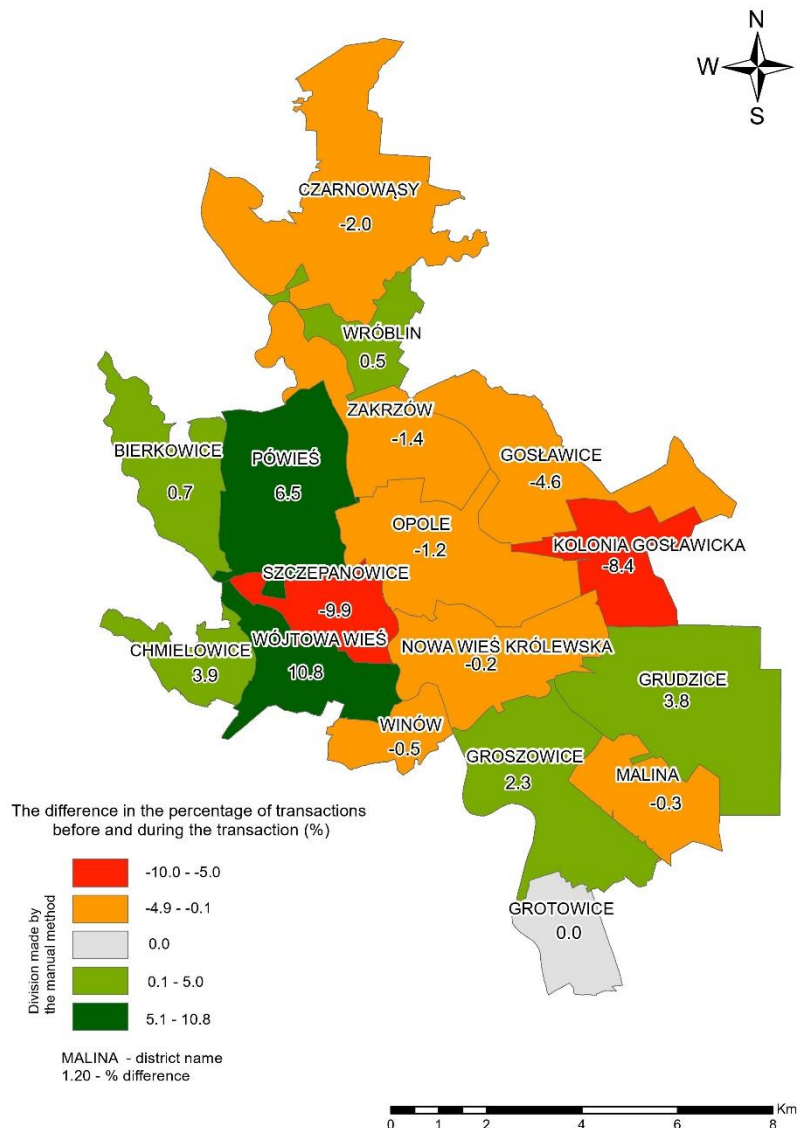
Figure 3: The share of transactions in the districts of Opole before and during the pandemic



Source: Author's elaboration based on housing market data and <https://gis-support.pl>



Figure 4: The difference in the share of transactions in the districts of Opole before and during the pandemic



Source: Author's elaboration based on housing market data and <https://gis-support.pl>

In order to assess the statistical significance of real estate price differences between two defined groups, the Student's t-test of equality of means for independent samples was used. This test allows for unequal sample sizes. A one-tailed test was used where:

$$H_0: \mu_1 = \mu_2 \text{ and the alternative hypothesis } H_1: \mu_1 < \mu_2.$$

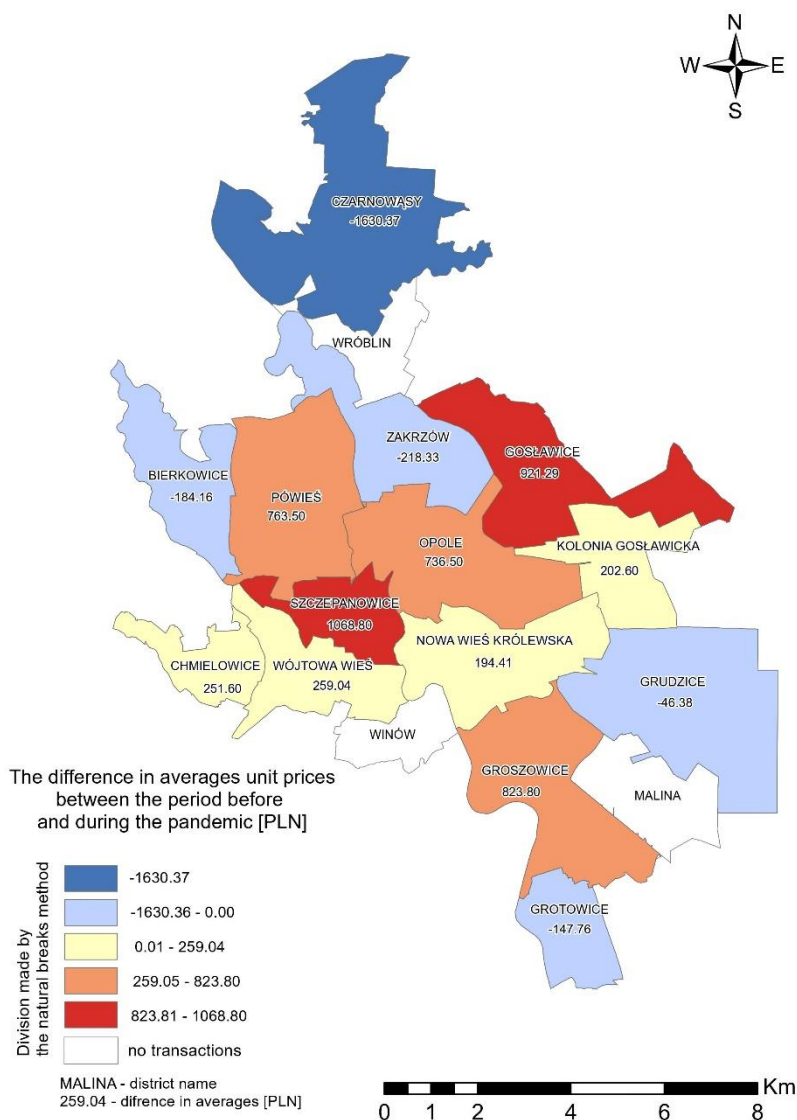
At a significance level of $\alpha = 0.05$, property prices were found to be higher during the pandemic than they were before the pandemic (taking into account the decrease in the long-term trend).

The spatial distribution of changes in the unit prices of residential properties within the city is interesting (Figure 5). The biggest increases in the unit prices of apartments were observed in



those districts in which the number of transactions dropped (between -5% and -10%). On the other hand, the districts with the biggest increase in the share of transactions saw an increase in unit prices, but at a medium level. It is important to remember that in a primary market there is a potential time lag between the decision to make a transaction and when that transaction is finalised. Therefore, although some transactions are recorded as having occurred during the pandemic, decisions about signing a development contract, an agreement on unit price, and the location of a piece of real estate could have been made before Covid-19 appeared.

Figure 5: Differences in the unit prices in Opole before and during the pandemic



Source: Author's elaboration based on housing market data and <https://gis-support.pl>

The results of the quantitative research presented in this article could be enriched in the future by a qualitative perspective. As the spatial distribution of real estate transactions shows, most of the turnover in the real estate market still happened in the centre of the city. This is consistent with findings showing that two-thirds of buyers reported that the Covid-19 pandemic had no impact on their housing preferences (Quint 2021). This pattern might differ when it comes to



the families that are benefiting from working remotely in the long term and those that only used this option during the pandemic (Counselors of Real Estate 2022). That could explain the location of the increased shares of transactions in our study. The possibility of using of working remotely could be one of the reasons that there was an increase in real estate transactions further away from the city centre and closer to open spaces. This indicates a more universal phenomenon that is well beyond the scope of this case study. In global mega-cities the choice of living outside of the core urban centre (and moving closer to open areas to which they then have easier access) may result in the migration of the urban population out of city centres and significant modifications to the urban structure in the form of urban sprawl. Conversely, in smaller cities places located only a few kilometres from the city centre may already provide good access to open areas, and therefore, it may not be necessary for people to migrate out of the city centre in order for people to still have the opportunity for daily recreation in a less urban neighbourhood.

Discussion

This study showed that real estate transactions before and during the Covid-19 pandemic differ both in terms of the price and the location of the residential properties. In the case of Opole, the number of transactions relating to residential units in the primary market increased in 2020 compared to other years. Other studies that considered shorter periods of real estate transactions, like quarters or months, observed a short-term decrease in the number of sales, but in a longer term the number of sales increased again, and this observation is consistent with the results of this research. The unit prices of recorded transactions confirmed that real estate buyers have become more economically heterogeneous, which indicates that the local community is becoming/has become more diverse. In a global context it is important that cities are able to offer a bigger variety of housing, especially given the current problem of housing (un)affordability on every continent. There is no clear spatial distribution of transactions that could characterise the pattern of clients' interests, which is a unique observation in the case of a small-sized city. In the case of districts located in a central part of the city that saw either increases or decreases in the number of transactions, the neighbourhood's spatial character could relate to its prestige (Foryś and Putek-Szelag 2017), much like what is observed during gentrification, or it could be the result of investment from developers (decisions made before the pandemic). One factor influencing the prestige of a location could be access to open spaces that offer an opportunity for recreation within the neighbourhood in which one lives. The importance of this factor noticeably increased during the pandemic in bigger cities globally, which resulted in a higher demand for real estate located more remotely from urban centres (Chmielewska et al. 2022; Gupta et al. 2022). Unlike in big cities, a small-sized city can offer citizens living a few kilometres outside the city centre more direct access to open spaces. Therefore, such cities may be more resistant to the global trends of urban sprawl and spreading suburbanisation.

The second assumption, connected with observed quantitative data characteristic in our research, is associated with time-lag. Transactions in the primary residential property market are delayed facts that result from contracts signed with real estate developers at an earlier point in time. However, other social aspects of buyers' activity in a local housing market can also have an impact here (Foryś, 2015). After adjusting the unit price value of residential properties for the trend in the pre-pandemic period, the study showed the impact of the pandemic on property transaction prices. The one-tailed Student's t-test of equality of means for independent



samples (before and during the pandemic period) proved that unit prices increased during the Covid-19 pandemic period, which means that society continued to see housing real estate as a stable form of investment of their financial resources. This is consistent with the findings of other research. Even the short-term shock did not change the fact that investors perceive real estate as a stable investment that guarantees the assets' value (Kowalski et al. 2023), which is reflected in a general pattern of value migration into the real estate sector. With increased demand for real estate and a relatively stable supply of this good, prices may increase as a result of investment activity. Prices may also rise as a result of a low level of competition between development companies. Studies have indicated that a high level of competitiveness between real estate development companies inhibited sharp jumps in housing prices during the pandemic (Augustyniak et al. 2021). At the same time, the rate of real estate construction in Opole was low compared to other cities in Poland (Antczak-Stępniać 2019). Investors in the real estate market may also have continued to engage in a noticeable level of market activity because the market was adjusting to new circumstances. Covid-19 had also an effect on how current technologies are used in the real estate sector (Zysk et al. 2022), as the limitations brought on by the epidemic forced businesses to substitute direct customer-seller contact with new technologies (Kania and Kmiec 2022).



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