

## Impact of the COVID-19 pandemic on the secondary market of real estates. A case study

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**Abstract.** The topic of the paper is the analysis of the situation in the secondary real estate market in Krakow from 2017 to 2020. The research was conducted based on data obtained from the register of real estate prices and values. The results of the research helped detect changes occurring in the indicated years; the number of transactions in the housing market in the city oscillated around the value of 4,000 for each year. The high demand for real estate was significantly disrupted by 2020 and the outbreak of the COVID-19 pandemic. Despite an almost 50% drop in the number of transactions and reduced interest from potential buyers, the price of 1m<sup>2</sup> of residential space rose steadily. Thus, the pandemic only affected the number of transactions, while no deceleration of the rising trend was observed in terms of the average transaction price or the average price per square meter.

**Keywords:** property, real estate, valuation, COVID-19, pandemic, real estate market, secondary market

### 1. Introduction

Real estate is an asset whose distinctiveness is characterized by a set of interacting factors. Three main groups can be distinguished, the combinations of which determine the uniqueness of real estate; these are physical, economic, and legal characteristics [1]. All these factors are mainly objective in nature, directly influencing the value of the property and most strongly affecting it, but the price is also determined by the subjective tastes and preferences of the buyer [2]. Among the physical factors, we distinguish: location, area of the property, and attractiveness of the surroundings (environment, available infrastructure, access to public transport, and service points). In the case of a dwelling, additional factors include the standard of the building (structural and technical solutions used, volume,

number of rooms, floors) and the manner of development of common parts [3]. The term "real estate" itself includes the most important of the physical factors – the inseparable connection of the object of the transaction with the land, and thus the immutability and constancy of the location. It determines the value and interest in a given property [4]. The economic (financial) category, in turn, is best defined and reflected by supply and demand, with the main assumption undoubtedly being equilibrium for these two phenomena [5]. Speaking of the real estate market, it is assumed that such a state of equilibrium practically does not exist, primarily due to the long-term growth of demand caused by the size and wealth of the local population, and the diversity of supply [6]. Deviations from this equilibrium are therefore a source of volatility in the market [7]. According to generally recognized norms of behaviour, the seller shapes the supply, and the buyer expresses his willingness to carry out the transaction. Thus, the real estate market is a system based on its own mechanisms that create it and are self-perpetuating [8]. The factors that determine the formation of a transaction are primarily the actors; there would be no transaction without demand, which is integrated with the living conditions and preferences of the community [9]. It cannot be overlooked that the market, as a regulatory mechanism in both the macro and microeconomic sectors, is unrivalled [10] in shaping the economy of the state as well as in creating complementary markets that include production sectors, services, capital markets, and monetary policy [11]. Legal factors are related to the type of property rights. Ownership and co-ownership rights are the most desired by the subjects of the transaction, closely correlated with the rights concerning the use of real estate [12]. The main characteristic of this market is the form of ownership of the property [2].

Characterization of the market and sales trends should be based on up-to-date and insightful analysis of transactions and factors, especially social, that may affect a given market. The quality and thorough study of phenomena are the elements least developed in the Polish market concerning the need for such data [4]. Considering the fact that the purchase of residential real estate is a long-term and expensive investment, and until the end of 2021, also a favourable alternative to bank deposits, it is important to collect and process data that would clearly help detect the mechanisms governing such a market [13]. The multitude of elements characterizing the real estate market makes the formation and analysis of data resources inexhaustible. However, the variation in the frequency of their use for aggregation and evaluation of phenomena creates great difficulties [4]. The field for maneuvering with data is greatly expanded by the obligation imposed by the legislator to collect data on transactions. The resource that is the register of real estate prices and values allows us to analyse sales trends and provides data that can be used when considering the impact of various factors, both anthropogenic and those of natural origin, shaping the real estate market.

## **2. Krakow's real estate market**

Krakow is a city with exceptional technological and development potential. Thanks to the opportunities it offers, especially to young people, it has become an attractive market primarily for students. The city of Kraków is an excellent place for both acquiring knowledge and working, which is why students often choose the Kraków agglomeration as their destination for further development [14]. Krakow's real estate market is the second most popular place to conclude transactions, after the capital [15]. In 2018, 64.7% of sold apartments came from city-counties, accounting for 74.7% of the sales value [16]. As indicated by the CSO, in 2019, for the areas of cities with county rights, sales reached more than 62% of the residential units sold, with the total value accounting for 72.5% of the turnover of this category of real estate [17]. According to data compiled by the Central

Statistical Office for 2020, more than 56% of the apartments sold on the secondary market came from the areas of cities with county rights, accounting for 67.3% of the total value of sales for the surveyed market [18]. There continues to be increased interest in apartments in the city center, leading to greater price differences between the inner city and areas away from it. While the secondary real estate market is often associated with something used and unattractive, many apartments appearing on the market are, in fact, renovated and do not differ in standards from those on the primary market [19]. Moreover, a renovated apartment is often accompanied by fencing and an improved appearance of the building. The Old Town area and the surrounding areas that make up Krakow's Srodmiescie are famous for their picturesque townhouses and backstreets, which are all the more enticing to potential buyers [13].

Based on data obtained from the residential real estate price database (Register of property prices maintained by the City of Kraków), the analysis in this paper was conducted. The relationship between transaction and bid prices in the secondary market is illustrated in Fig. 1. For the bid price, there was a gentle decline in late 2020 and early 2021, primarily caused by the outbreak of the COVID-19 pandemic and the national lockdown, leading to a temporary slowdown in the economy. The remaining quarters are marked by a clear linear increase, suggesting an upward trend in demand.

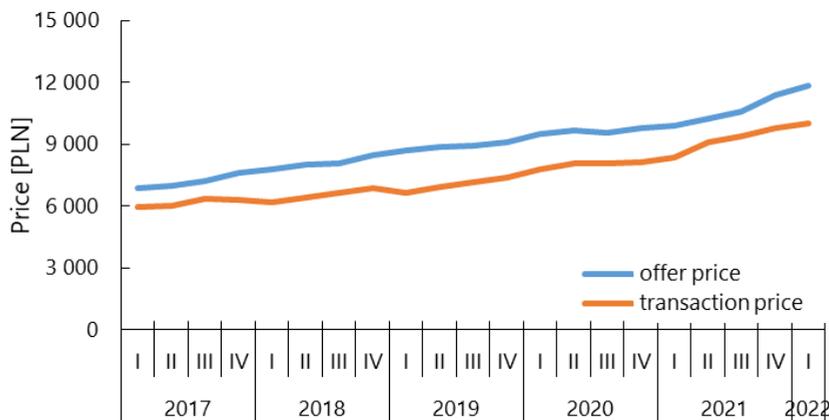


Fig. 1. Average prices per 1 sqm (square meter) of an apartment on the secondary market in Krakow [20]

The clear impact on the decline in the transaction price was inflation, which, at the beginning of 2019, was around 0.9%, increasing later to 2.6% and progressively growing each month, reaching more than 10% in 2022. This situation caused prices to fall more in the first two quarters than in the rest of the year. Before 2019, the average transaction price rose linearly and largely uniformly. The difference between the offered price and the transaction price draws attention to the pandemic period. Fewer investments were made due to fears about the future, and the work of real estate agents was hampered by restrictions.

### 3. Methodology

To analyse the secondary real estate market, data from 2017-2020 were collected on transactions of residential units in the secondary market within the city of Krakow. The year 2021 was excluded from the analysis due to the time lapse between the transaction and the corresponding entry in the price register. Data received from the relevant office were filtered

based on the parties involved in the transaction and the document confirming its conclusion. Residential units from the secondary market, including the area, gross price of the unit, and identifier used for further analysis of sales in individual districts of Krakow, were extracted. The register was organized according to the transaction date, and empty or incomplete records were removed. Transactions with incomplete data were discarded. Initially, the register contained over 70,000 records per year, covering all transactions in the market. After analysis and appropriate data filtering, this range was reduced to about 2-4 thousand. The significant difference is primarily due to the fact that the database received from the authority includes all transactions, even those not relevant to the analysis. Additionally, some records lacked data, making their inclusion in the market study impossible. The completeness and authoritative nature of the register were also influenced by the human factor, as it contained coarse errors resulting mainly from mistakes during data entry.

The data ordering mechanisms were based on selecting parameters in accordance with those proposed in the registry to ensure comparability of properties. The data were also analysed for reliability and correctness; prices per square meter of housing were considered in the range of PLN 3,500 to PLN 11,000. Extreme values, representing coarse errors, were removed, accounting for about 5% of the data.

#### 4. Results

The Krakow secondary market has maintained a state of stable periodic growth in terms of the number of transactions until 2018. Each year, the holiday season witnesses a higher number of transactions compared to the months around the turn of the year. An exception to this pattern was 2020, where only the first quarter resembled other years, with the subsequent quarters marked by a decline in the number of apartments sold (Fig. 2). On an annual basis, the decrease in the number of transactions in 2020 exceeded 45% compared to previous years. Among the years analysed, the highest number of apartments sold was recorded in the third quarter of 2018.

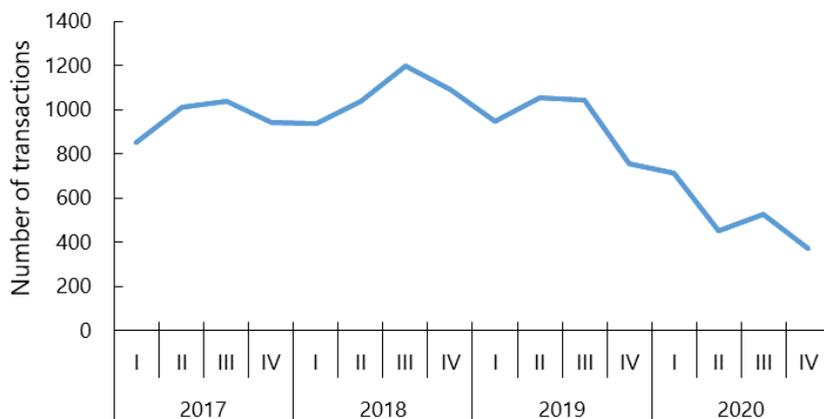


Fig. 2. The number of transactions in Krakow's secondary apartments market

The market was then examined in terms of the average price per square meter of housing by location (Fig. 3). Despite a significantly lower number of transactions, the prices of units steadily increased. In 2020, the price per square meter of an apartment oscillated around PLN 8,000. The dominant district in this regard remains Srodmiescie (PLN 8,621),

followed by Krowdrza (PLN 8,393) and Podgorze (PLN 8,126). The cheapest apartments per square meter were found in the area of Nowa Huta (PLN 7,759). The difference between the average marginal prices in the Srodmiescie and Nowa Huta districts has gradually decreased over the years from PLN 1,705 per square meter to PLN 634 per square meter. In the case of the Podgorze district, the average price is closest to the median of the analysed set, making it the most optimal price for a potential buyer. Analyzing the distribution of prices over four years, the prices of 1 sqm increased the most for Nowa Huta (by 46%, or PLN 2,450), while the smallest increase (by 22%, or PLN 1,526) was recorded in Krowdrza.

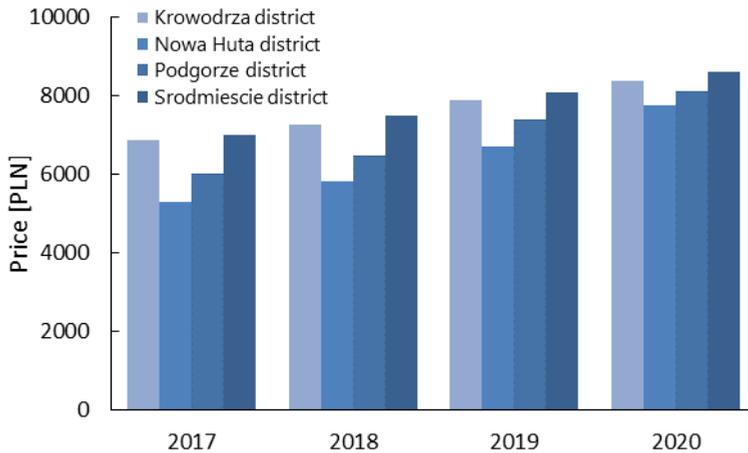


Fig. 3. Mean price of 1 sqm of an apartment in Krakow's districts

Invariably for years, the district where the largest number of transactions is concluded has remained Podgorze district. Every year, more than a third of the apartments sold come from this area. Similar to the price analysis, the number of transactions experiences an increase until 2018, and then there is a decrease. The area for which transactions are concluded most often is the Podgorze district, while the least transactions are observed in the Srodmiescie area (Fig. 4). The gap between prices in Podgorze and Krowdrza is steadily shrinking, which could be the result of more affordable housing appearing on the market or the depletion of stock in areas that have been leading so far.

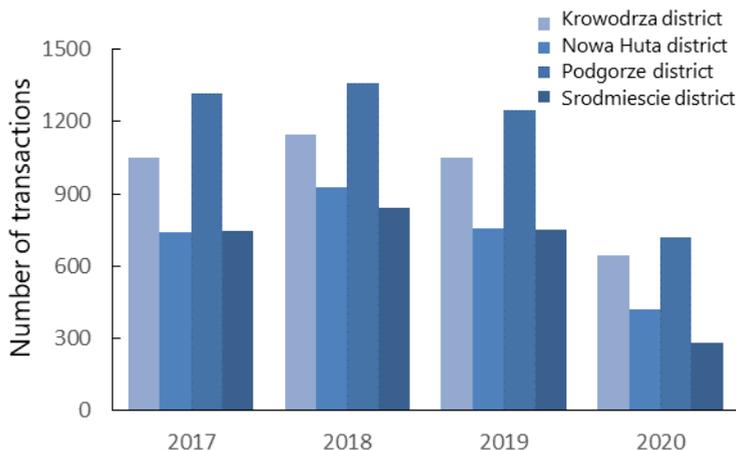


Fig. 4. Number of apartments transactions divided by year and district

The structure of sold apartments was also examined, and the data were divided into ranges differentiating apartments by size. The charts below depict the distribution of apartments across four ranges: less than 30 sqm, 30-50 sqm, 50-70 sqm, and above 70 sqm (Fig. 5).

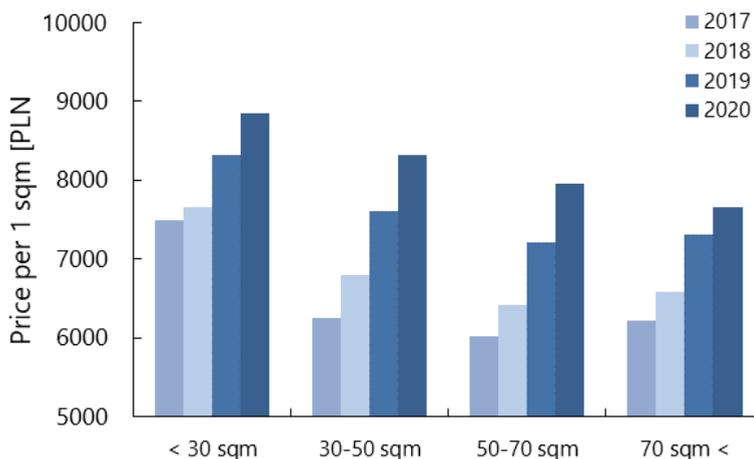


Fig. 5. The distribution of the price per square meter depending on the size of the apartment

Medium-sized apartments are the most popular, with dwellings in the range of 30-50 sqm being overwhelmingly favoured by buyers, constituting approximately half of all transactions. The turnover of small apartments, i.e., those below 30 sqm, as well as larger ones (above 70 sqm), remains stable. In terms of the total transactions made, approximately 50% involve medium-sized dwellings in the range of 30-50 sqm.

## 5. Summary and discussion

The COVID-19 pandemic has significantly impacted the housing market, bringing about numerous changes in buyers' preferences and needs. Increased interest in off-center properties has been observed in many cities globally, as remote working has provided greater flexibility in choosing a place to live. In some regions, property prices have risen as investors sought secure places to invest their capital, considering real estate a relatively stable asset. The pandemic has also affected the construction of new housing, leading to delays in projects and increased costs associated with the supply of building materials, potentially influencing the availability and prices of housing on the market. The study focused on analysing the secondary real estate market in the city of Krakow, aiming to detect trends determining sales in the market under study. Data from residential unit transactions from 2017 to 2020 were obtained from the City Hall of Krakow in the form of a register. Comparing 2020 with previous years, the number of transactions dropped by half, largely due to the COVID-19 pandemic. Strict measures hindered the buyer-seller relationship, leading to reduced investments and the introduction of remote learning, affecting the demand for student housing. Despite the decrease in transactions, the price per square meter steadily increased. In 2020, the highest prices for 1 sqm of an apartment reached an average of PLN 8,621 in Krakow's City Center, while the cheapest remained apartments located in Nowa Huta (an average of PLN 7,759 per 1 sqm). Over four years, the largest price increase was recorded in Nowa Huta (by PLN 2,450), and the smallest in the Krowdrza area (by PLN 1,526). Podgorze emerged as the district with the greatest interest due to its convenient infrastructure and location in the vicinity of the city center. In contrast, the central part of Krakow (Srodmiescie) had apartment prices closest to the average, making it the most popular choice as location aligned with price. Medium-sized dwellings in the range of 30 sqm to 50 sqm have consistently been the most sought after for years, accounting for about half of all choices. The least interest is shown in the smallest apartments (below 30 sqm) and the largest ones (above 70 sqm), with the former tending to be the most expensive and the latter the most challenging to access.

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