Changes in the Structure of the Apartments Rental Segment in Poland During the COVID-19 Pandemic

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Abstract:

Purpose: The main purpose of the paper is to indicate the structure of a rented apartments during the COVID-19 pandemic in a group of 6 largest cities in Poland. The question was furthermore raised: has there been a change match supply and demand in the rental segment during this period?

Design/Methodology/Approach: The research used one of the statistical method. This made it possible to research developing the apartments structure in the rental segment regarding the analysis of the structural series.

Findings: The research presented shows that the sanitary and epidemiological restrictions during the COVID-19 pandemic had a significant impact on the structure of rental apartment. During this period, the degree of matching of supply and demand in the rental segment in Poland also changed.

Practical implications: Research has shown that the structure of a rented apartments is also affected by factors related to the global COVID-19 pandemic. This broadens the catalogue of factors determining change in this area. It is possible to continue this research in other Polish cities to provide a comprehensive picture of the changes in the structure of rented apartments.

Originality/ value: This research question complements real estate research by analysing the structure of the apartments stock in the rental segment during the COVID-19 pandemic. These researches are in line with the development trend of research on the rental segment, which in the literature to date, often remains on the margins of economic research.

Keywords: Rent, Residential Real Estate, Statistical Method, COVID-19 pandemic.

JEL codes: R31, C18.

Paper type: A research paper.

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1. Introduction

The COVID-19 pandemic had far-reaching consequences for the global economy. Not only individual companies and households but also entire economies have undergone significant socio-economic changes. Causing the pandemic was disrupting supply and production continuity, which was reflected available individual goods and services.

One sector of particular interest to researchers in this context is the apartments market. As the pandemic developed, there was a wave of speculation about the impact on the Polish rental segment. There has been speculation about the effects of lockdowns and remote work, the outflow of students from large metropolitan areas, a possible weakening of demand, developing rent prices and the declining profitability of investments in this market (Tomal and Marona, 2021a, p. 30).

An important aspect in this context, however, is the impact of the pandemic on the apartment structure in Poland. This problem seems to be crucial, as the changes in this structure highlight the impact of the crisis on the demand for different premises. This makes it possible to characterise the market in a shortage of apartments with the characteristics desired by potential tenants or a possible oversupply of individual apartments (Kuk *et al.*, 2021, p. 4).

The Polish housing and apartments rental market is underdeveloped compared to other European Union countries (Górski *et al.*, 2021, 53-68; Rącka and Khalil ur Rehman, 2018). The vast majority of Poles want to own a home, while almost half of Poles consider renting unprofitable (Rubaszek and Czerniak, 2017, 197-233). This segment continues to develop.

This is reflected in the increase in the number of natural and legal persons offering apartments for rent, which has almost doubled in recent years. The domestic rental segment is concentrated in cities. By the end of 2021, the vast majority of rental offers were in metropolitan areas with over 500,000 inhabitants and large cities with 100,000 to 500,000 inhabitants.

It was these reasons, among others, that led to identifying the research problem. There are two key issues at stake. Has the structure of a rented apartments in Poland changed because of the COVID-19 pandemic? Has the demand and supply of the individual apartments groups changed? The analysis of the impact of the pandemic crisis on the Polish rental segment in changes in the structure of demand and supply was carried out based on data for six cities, Gdansk, Gdynia, Krakow, Lodz, Poznan and Wroclaw.

Warsaw was established because of the peculiarity of the capital's rental market, which is because Warsaw is the largest economic centre in Poland and Central

Europe (Waszczuk, 2018). Therefore, the study selected the other largest cities in Poland, where both the real estate market and the rental segment are well developed.

2. Materials and Methods

To explain developing the rental sector during the COVID-19 pandemic, a quantitative method, the statistical method, was used. This made it possible to study the changes in the apartments structure in the rental segment, especially regarding the analysis of the structural series (Krzeczewski, 2015; Ott and Longnecker, 2015).

The research used structural indicators and moving averages. Based on the method of descriptive statistics, a time series study (Granger and Hatanaka, 2015) was also used to analyse the dynamics of changes during the COVID-19 pandemic. Rental prices have not been considered, which is the most common practice of apartments market analysis (Tomal and Marona, 2021a). The focus was on the structure of the apartments ownership.

The research used statistical data collected by the National Bank of Poland as part of the Real Estate Market Survey. They include data on offers and transactions in the rental segment of apartments. They are divided by cities and by many original features that describe the property.

However, two characteristics were used in the research submitted. That is the area and the number of rooms. The first feature has been divided into several surface groups. The analysis included flats with an area of 21-40 sq. m. (group II), 41-60 sq. m. (group III), 61-80 sq. m. (group IV) and 81-120 sq. m. (gr. V). The remaining area groups were omitted because of the small share of these apartments in the rental segment in Poland. Because of the number of rooms, the apartments are grouped into 1, 2, 3 and 4 or more rooms.

In the research, a period of 1Q2015 to 2Q2020 and data shall be provided at quarterly intervals. It was assumed that early 2020 was the phase of the outbreak of the COVID-19 pandemic in Poland. Changes in apartment structure in the six largest cities in Poland were investigated. These include Gdansk, Gdynia, Krakow, Lodz, Poznan and Wroclaw.

The analysis of the structure of the apartments in the rental segment in Poland estimated the share of offer/transaction in the individual characteristic groups in relation to the totality. For this purpose, the formula was used:

$$SNO_t = \frac{NO_{t,i}}{NO_t} * 100 \text{ and } SNT_t = \frac{NT_{t,i}}{NT_t} * 100 \tag{1}$$

where:
SNO_t/SNT_t – structure of the number of offers/transactions

$NO_{t,i}/NT_{t,i}$ – number of offers/transactions for apartments with i-term characteristic,
NO_t/NT_t – total number of offers/transactions over time t,
i – i-this feature of the apartment.

The time t is the individual quarters examined. Since the rental segment in Poland is dynamic and subject to some seasonal fluctuations (Belej and Kulesza, 2015), the simple moving average for 4 quarters was estimated using the formula:

$$SMA_{t,i} = \frac{SN_{t,i} + SN_{t-1,i} + SN_{t-2,i} + SN_{t-3,i}}{4} \tag{2}$$

These values were estimated for the supply structure (SNO) and the transaction/demand structure (SNT).

The research submitted also estimated adapting apartments supply to rent demand. The apartments supply was defined as a rental offer. As a result, the real demand for apartments is revealed in the rental transactions. This is because of the flow of resources in the apartments market, which reveals the dynamic interaction between supply and demand (Kohler and van der Merwe, 2015). In this context, the change of demand for apartments supply has been calculated using the formula:

$$SIRA_{t,i} = \frac{SMAO_{t,i}}{SMAT_{t,i}} - 1 \tag{3}$$

where:
$SIRA_{t,i}$ – supply index of rented apartments
$SMAO_{t,i}/SMAT_{t,i}$ – SMA values for offers/transactions at time t.

The SIRA index should be interpreted as follows. If the index value is zero, there will be an ideal match between supply and demand. However, if the SIRA value is greater than zero, the market will have an oversupply of rental offers and vice versa. The results to be interpreted for the apartments structure in the rent segment under consideration. A positive value of this index indicates an oversupply of apartments with a particular characteristic compared to the demand for such apartments.
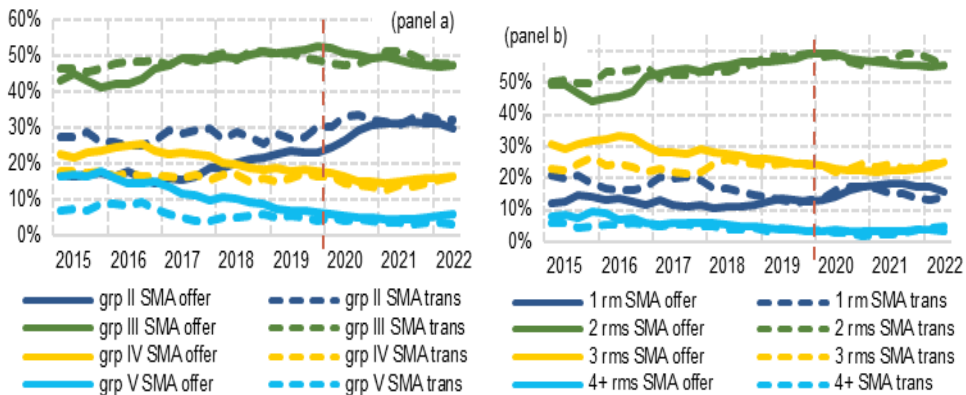
3. Results

As a first step, developing the property structure in the apartments rental segment in Poland during the COVID-19 pandemic was analysed. Some changes have already occurred at this stage (Figure 1). It was found that the structure of the apartment on offer has changed. There was a significant increase in the number of apartments in the second area group. This was clear in 2020, where the average YoY index was 119.7%. The following year, growth was also quite dynamic, with the average YoY index of 113.6%.

The increase in the number of apartments from 41 to 60 sq. m. was accompanied by declines in other areas. During the entire period 1Q2020-2Q2022, the average quarterly YoY dynamic index was 96.7% for apartments of the III-Gr., 95.6% for the IV-Gr. and 93.2% for the V-Gr. area.

However, these developments are in line with the trends observed throughout the period considered. Exceptions, however, are developing this trend for apartments in area group III and the marked acceleration of the growth of apartments in 2020. Similar changes were observed in the structure of the apartments because of the number of rooms. This dependency is not surprising, since the area of the apartments and the number of rooms are linked.

Figure 1. *Comparison of apartments structure (average 4Q) for offers and transactions by area group (panel a) and number of rooms (panel b) – group of 6 cities.*

Source: *National Bank of Poland.*

The previous list of analytical results also indicates some changes in transactions. However, they should be examined to match demand with the supply of rental apartments (Figure 2). The SIRA index was used for this purpose. The figure indicates some changes that occurred after 2020 in the group of apartments in an area of 21-40 sq. m..

An upward trend was observed, which started in 2017 and sped up in the second half of 2020. As a result, the SIRA index for this group of apartments was close to zero, reaching 1.8% at 2Q2020. It looks different in the residential group with an area of 41-60 sq. m.. A powerful match between supply and demand can be observed here, especially in 2017. An exception was also the period 3Q2019-3Q2020, in which a short-term increase in fit was observed.

After that, the situation has become normal, with the SIRA index deviating from zero. With quite obvious changes, we have to consider in the group of apartments with an area of 61-80 sq. m. After a significant decline in the SIRA index in the

period 2018-2019, the value has stabilised. In the period 2020-2021, the average was 10.7%. Last year it fell to -1.0% at 2Q2022. Strong changes in the SIRA index can be observed for the largest apartments studied.

These results were placed on the right axis. After the dynamic declines in 2018, the index stabilised and fell further in 2020. The average quarterly index value was 22.6% in the period 1Q2020-2Q2021 and then increased to 93.9% at 2Q2022. Panel b in Figure 2 also indicates the values of the SIRA index for the apartments structure by the number of rooms. Also in this case, clear changes were observed after 2020. Since 2Q2020, there has been a rapid increase in the index for 1-room apartments. It increased from -12.8% (2Q2020) to 33.4% (1Q2022).

This means an increase in the oversupply of this apartments group. In contrast, the SIRA index for the most roomed apartments increased in 2020 (to 55.2% at 4Q2020), before declining to -30.5% at 2Q2022. In the remaining apartments groups, the SIRA index remained stable during the COVID-19 pandemic. The average quarterly values for the period 1Q2020-2Q2022 were -1.2% for 2-bedroom apartments and -3.0% for 3-bedroom apartments.

Figure 2. *Supply index of rented apartments (SIRA) by area group (panel a) and number of rooms (panel b) – group of 6 cities.*
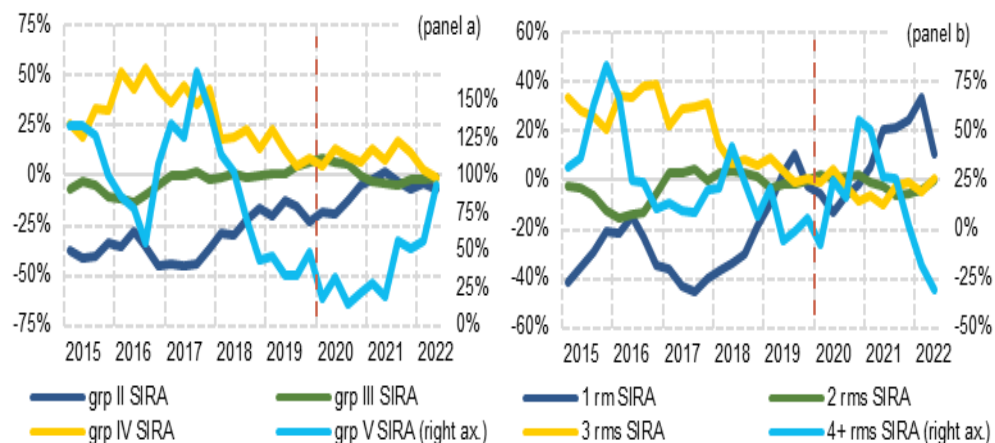
Source: *National Bank of Poland.*

Changes in the structure studied can also be seen when comparing developing the SIRA index with developing the supply and demand situation of apartments to be rented for each group.

Figure 3 indicates these comparisons by area group. In a group of apartments with an area of 21-40 sq. m., significant changes were noted in the change of supply to demand. After a strong demand side compared to apartment supply, the SIRA index for 2Q2021 was revised above zero (1.8%) for the first time since 2010.

Thus, after the outbreak of the COVID-19 pandemic, there has been a strong alignment between supply and demand, with the latter having only a minor advantage. A different situation was observed for apartments in an area of 41-60 sq. m. The onset of the pandemic coincided with a strong increase in rented apartment oversupply. In 1Q2020, the SIRA index reached a value of 8.3% and then fell to -4.8% at 3Q2021.

After a period of relative stability (2017-2019), these changes are characterised by strong short-term shocks. Another situation was observed for apartments with an area of 61-80 sq. m. During the current COVID-19 pandemic, a relative convergence of the SMA values for offers and rentals of this group of apartments has been observed. This shows the relative match between supply and demand during this period. The average SIRA index for the period 1Q2020-2Q2022 was 8.7%.

In the period 1Q2010-4Q2019, it reached an average of 27.3%. Some changes after the outbreak of the pandemic also occurred in a group of apartments with an area of 81-120 sq. m. Since 1Q2020, the SIRA index has declined. Up to 2Q2021, the mean value was 22.6% and then increased to 93.9% at 2Q2022.

Figure 3. *Comparison of apartments structures (average 4Q) for offers and transactions and SIRA index separated by area groups (panels a-d) – group of 6 cities.*
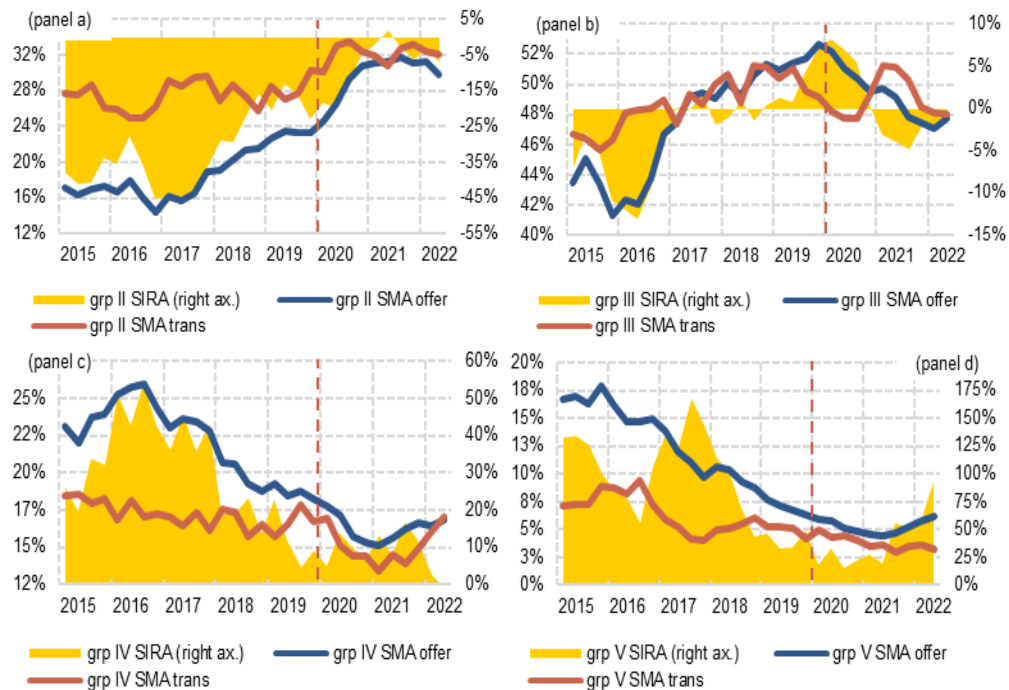
Source: *National Bank of Poland.*

Similar changes were observed in groups of apartments by number of rooms after the outbreak of the COVID-19 pandemic. The relationship between the area and the number of rooms is quite obvious, but it is not an exact relationship. It is therefore useful to describe also the characteristic changes in the change of supply and demand for rented apartments according to this criterion (Figure 4).

In the group of one-bedroom apartments, there was a strong increase in their share of the total population in 2020, while the SIRA index remained stable. The average value for this period was -6.6%. Since 2021, a large discrepancy has been identified, comprising a decrease in the demand for these apartments.

The highest level of the SIRA index was reported at 1Q2022 when it was 33.4%. Variations in the level of change were also observed in 2021 for 2-room apartments. Here, however, there was an increased demand for rental offers. The SIRA index reached its minimum at 3Q2021 with -5.9%.

In the group of 3-bedroom apartments, a relative stabilisation of supply and demand was observed after the outbreak of the pandemic. The average SIRA index in the period 1Q2020-2Q2022 reached -3.0% with an average value of 19.1% in the period 1Q2020-4Q2019.

In the group of apartments with the most rooms, a strong increase in the SIRA index was observed after the outbreak of the pandemic. The highest value was reached at 4Q2020, when it was 55.2%. In the following quarters, the value decreased to -30.5% at 2Q2022.

4. Discussion and Conclusions

The COVID-19 pandemic has proved to be a determinant of many socio-economic changes in almost all parts of the world. It correlated with changes function entire communities (Pedrosa et al., 2020). This led to a chain of changes in the economy (Granovetter, 2017). Changes in human behaviour also have a significant impact on rational decisions (Herfeld, 2018).

This mechanism, although described here in a simplified way, has also been observed in the real estate market and also in the rental of apartments in Poland. The research presented was aimed at examining the structural changes in this sector during the ongoing COVID-19 pandemic.

The research results presented indicated two major changes. Foremost, changes in the structure of the apartments because of the area and number of rooms should be mentioned. In this area there has been a significant increase in offers and transactions of apartments with an area of 21-40 sq. m. and 1-room apartments with simultaneous decline of apartments of 41-60 sq. m. and 61-80 sq. m. and

especially2-room apartments. This shows a change in structure after the outbreak of the COVID-19 pandemic.

Figure 4. *Comparison of apartments structure (average 4Q) for offers and transactions and SIRA index separated by number of rooms (panels a-d) – group of 6 cities.*
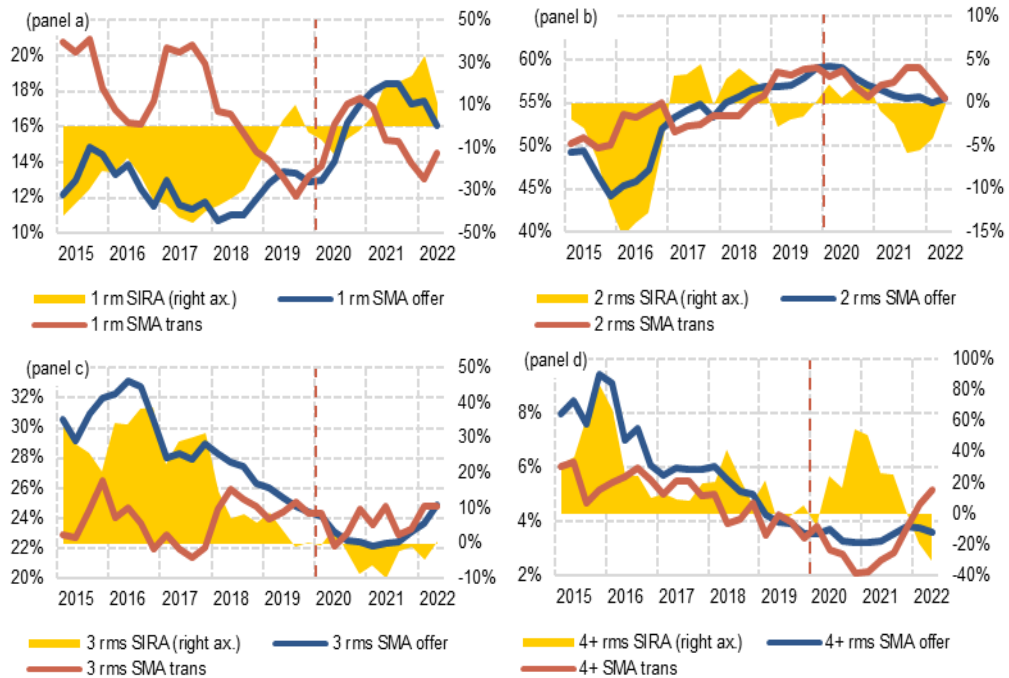
Source: *National Bank of Poland.*

The second change concerns matching demand and supply of rental apartments, as described above. On this basis, it may be concluded that the sanitary-epidemiological restrictions which have led to changes function society in Poland have also become an indirect determinant of changes in the structure of rented apartments on both the demand and supply sides.

However, it should be emphasized that the apartments rental segment concerns heterogeneous goods (Bocart and Hafner, 2015; Freybote and Seagraves, 2017; Robinson and McAllister, 2015). This alone means that there are various factors that influence consumer choices. The supply side is also influenced by several determinants with different characteristics (Piasecka, 2017). All this means that the above statement may not be justified, at least to a certain extent.

Changes in the structure of the apartments rental segment in Poland may have changed during the outbreak of the pandemic also because of other determinants. This does not mean that sanitary and epidemiological restrictions should be put aside.

Changes in work style (Adamowicz, 2022), way of studying (Szopinski and Bachnik, 2022), restriction on professional mobility (Kramer and Kramer, 2020) and even changes in our lifestyle (Alzueta *et al.,* 2021) during the COVID-19 pandemic in was determined by consumer choices, also in the segment of apartment rental.

The research results presented here make it possible to defend the above statement. It can be concluded that the COVID-19 pandemic, to some extent, changed the structure of apartments for rent in Poland, both in terms of demand and supply. This is also confirmed by other scientific studies (Kuk *et al.,* 2021; Marona and Tomal, 2020; Tomal and Helbich, 2022; Tomal and Marona, 2021b; Trojanek *et al.,* 2021).

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