


Analysis of the residential unit market in large-panel-system buildings, considering the forms of ownership

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Summary

The objective of this article was to assess whether the form of ownership of residential units can influence their transaction prices in the real estate market. The analysis considered two forms of ownership: full (separate) ownership of a residential unit and cooperative ownership rights to a condominium unit. The study focused on units sold between August 2020 and August 2022. The studied units are located in buildings belonging to the Nowy Prokocim Housing Cooperative in Kraków.

The study area is an example of a large, uniform housing estate characterized by block-of-flats' development with a regular urban layout. The buildings housing the units under analysis were constructed using large-panel-system technology, as part of the industrialized housing construction systems prevalent at the time, and they were built in the 1970s and 1980s.

The uniformity of location, technology, and functionality of these buildings allowed for the elimination of many variables affecting the market prices of residential units, making it possible to examine the impact of different forms of ownership on real estate prices. The analysis covered 123 residential property transactions, including 62 units with full (separate) ownership rights and 61 with cooperative (proprietary) ownership rights. The market analysis was conducted using descriptive statistics and linear regression. The results of the analysis showed that in the market in question, the studied ownership forms were not a factor in price differentiation. Residential units with both separate ownership rights and cooperative ownership rights achieved similar market prices, exhibiting similar growth rates over the two-year period under analysis.

Keywords

real estate market • cooperative proprietary rights to premises • full (separate) ownership rights
• housing cooperative

1. Introduction

The housing market in Kraków plays a key role in the city's development, attracting both investors and individuals seeking residential premises for their own needs. Although Kraków is most often associated with historic nineteenth-century tenement houses, distinguished by their exceptional decorative qualities and the distinctive ornamentation of their facades and staircases, a significant portion of the city's housing stock consists of large-panel-system buildings constructed using industrialized technologies between 1950 and 1990 [Runkiewicz 2021, Dzierżewicz and Starosolski 2010, Lewicki 1979]. These buildings are located in housing estate developments, typically with good access to municipal public transport, educational and commercial infrastructure, and abundant greenery [Wiśniewski 2024]. The buildings are mostly owned by housing cooperatives.

According to data from the Central Statistical Office of Poland, at the end of 2022, housing cooperative apartments constituted 29.6% of the housing stock in multi-apartment buildings throughout Poland [Housing Economy... 2023]. At that time, over 2,600 housing cooperatives operated in the country, managing a total of approximately 2 million apartments with an area exceeding 100 million m². The cited statistical data includes owner-occupied apartments (occupied under a cooperative proprietary ownership right to a residential unit) or tenant-occupied apartments (occupied under a lease agreement) located in buildings owned or co-owned by housing cooperatives [Stępień 2024].

Housing cooperatives have existed in Poland since the late nineteenth century. Their dynamic development occurred in the interwar period in response to the demand for housing in industrial centers. The first Polish law regulating the operation of cooperatives, including housing cooperatives, was the Act of October 29, 1920, i.e. the Cooperative' Laws (Journal of Laws of 1920, No. 111, item 733).

After World War II, despite the enormous demand for housing, cooperatives' activities were limited; they were also subordinated to the State. It was not until the second half of the 1950s, with a shift in the State's approach to housing, that the role of cooperatives significantly increased. Housing economy management tasks were largely entrusted to housing cooperatives, which then became the primary entity meeting society's housing needs. Since the mid-1970s, housing cooperatives have become a near-monopoly investor in urban housing construction. Favorable legal regulations, mass membership, favorable financing conditions, and the introduction of new, cheaper construction technologies [Malazdrewicz et al. 2022] contributed to the dynamic development of housing cooperatives [Stępień 2019]. With the development of housing cooperatives in Poland, the cooperative ownership right to a unit has emerged as one of the forms of ownership. Its essence and character are described primarily in Chapter 2 of the Act on Housing Cooperatives (Journal of Laws of 2024, item 558, as amended) and

classified in Article 244 § 1 of the Civil Code (Journal of Laws of 2024, item 1061, as amended). Pursuant to Article 17.2 of the Act on Housing Cooperatives, 'The cooperative ownership right to a unit is a transferable right, it is hereditary, and it is subject to enforcement. It is a limited property right.' The formal owner of a unit covered by a cooperative proprietary ownership right to a condominium unit is the housing cooperative. A person holding a cooperative ownership right to a unit has only a limited property right, which includes the use and disposal of the unit.

The owner has the broadest scope of rights to the housing unit under separate i.e. full ownership right (with unit as a separate property). The method of establishing separate ownership of independent residential property is specified in the Act on Ownership of Properties (Journal of Laws 1994, No. 85, item 388, as amended). Full ownership of property is characterized by compulsory, indivisible, and irrevocable joint ownership of parts of the land and those parts of buildings and facilities that are not intended for the exclusive use of the owners [Kisilowska 2011]. Examples of such parts include the roof, foundations, staircase, laundry room, drying room, electrical, water, heating, and air conditioning installations, and the elevator [Piekorz 2024]. Establishing separate ownership of property requires an entry in the land and mortgage register.

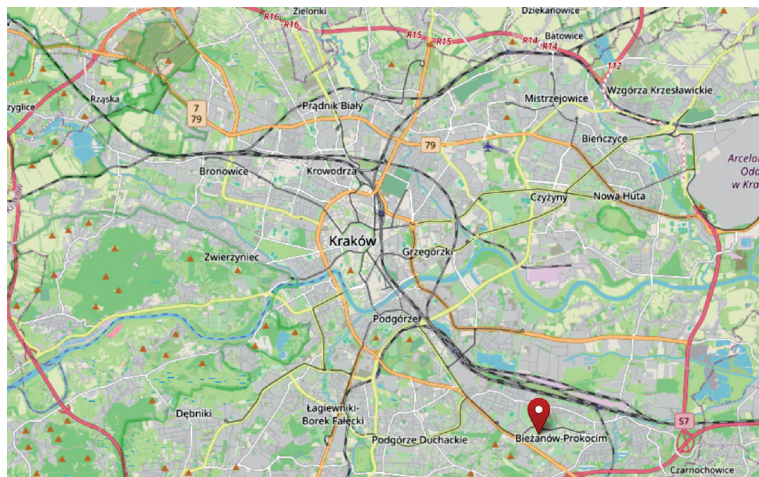
Members of housing cooperatives can obtain full ownership rights to their units through the transformation of the cooperative ownership right to the unit, in accordance with Article 17.14 of the Act on Housing Cooperatives.

The objective of the analysis presented in this paper is to answer the question of whether the form of ownership of the residential unit affects its price. The analysis considered two basic forms of ownership: the right of separate ownership of the unit, for simplicity referred to as the separate property right, and the cooperative ownership right to the residential unit. In other words, the goal of the analysis is to determine whether apartment buyers recognize and take into account the differences between these two forms of ownership and whether they are willing to pay a higher price for apartments with separate ownership rights, which are the broadest and most comprehensive right to possess a property.

The analysis was conducted for the housing stock of the Nowy Prokocim Housing Cooperative, operating in Kraków. Limiting the study area to the stock of a single cooperative minimized the impact of other property characteristics on prices, such as location relative to the city center or infrastructure, which the given housing cooperative is equipped with.

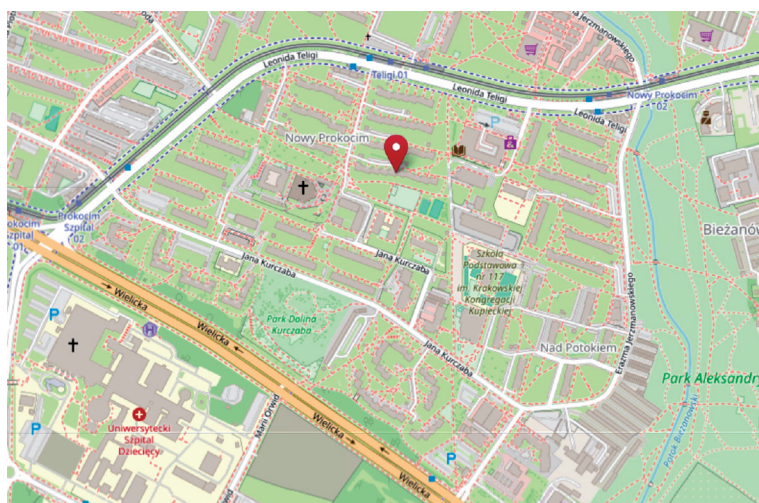
2. Research area

The study covered residential units located within the Nowy Prokocim Housing Cooperative in Kraków, located in the southeastern part of the city, in the Podgórze cadastral unit, cadastral district no. 55 (Fig. 1). Transactions involving residential units located on the streets of: Erazma Jerzmanowskiego, Jana Kurczaby, Konrada Wallenroda, Leonida Teligi, Lilli Wenedy, and Księdza Piotra Ściegiennego have been analyzed (Fig. 2).



Source: <https://www.openstreetmap.org> (accessed: 11 October 2025)

Fig. 1. Location of the studied area relative to the centre of Kraków



Source: <https://www.openstreetmap.org> (accessed: 11 October 2025)

Fig. 2. A plan of the area belonging to the Housing Cooperative, showing residential buildings and other facilities within its resources

The selected area constitutes a coherent urban complex with a homogeneous functional and spatial character, dominated by prefabricated, multi-family large-panel-system housing. The analyzed development is characterized by an open urban layout, with green areas, parking lots, and pedestrian paths located between the buildings. It

has full technical infrastructure and well-developed social amenities, including educational institutions, retail and service outlets, as well as health clinics.

The Nowy Prokocim Housing Cooperative was established on November 24, 2000, following the separation of the Na Kozłówce, Nowy Bieżanów, and Nowy Prokocim housing estates from the Kraków Housing Cooperative. The Cooperative's assets include a total of 48 five-story and 12-story residential buildings constructed using very similar construction techniques, six commercial pavilions, and garage complexes, which were acquired from the Kraków Housing Cooperative. These buildings were constructed between 1974 and 1994. Thermal modernization of the buildings was carried out between 2000 and 2010, improving energy efficiency, and the central heating system was modernized between 2005 and 2015 (<https://sm.nowyprokocim.pl/>).



Source: <https://sm.nowyprokocim.pl/zasoby/>, <https://sm.nowyprokocim.pl/> (accessed: 11 October 2025)

Fig. 3. Residential buildings within the housing stock of the Nowy Prokocim Housing Cooperative

The selection of a study area within a coherent urban complex enabled the designation of a set of residential units subject to transactions with a high degree of similarity in property characteristics, such as distance from the city center, access to public transportation, technical infrastructure, building construction technology, apartment layout, proximity to green spaces, and the overall attractiveness of the surrounding area.

3. Data and methods

The analysis covered purchase and sale transactions of residential units belonging to the housing stock of the Nowy Prokocim Housing Cooperative. Data on the sold units and their transaction prices comes from notarial deeds. Only units located in buildings constructed between 1975 and 1984 were selected for analysis, ensuring comparability in terms of technical condition and construction technology. Therefore, all transactions involving units located in buildings constructed in the 1990s were removed from the study database. The cooperative's holdings include four such buildings, constructed between 1992 and 1994.

The research covered two years, from August 2020 to August 2022. Only units with full set of information regarding usable area, floor location, ownership status, transaction date, and transaction price were included in the analysis. Ultimately, the analysis covered 123 secondary market transactions, 62 of which involved full ownership rights to the property and 61 involved cooperative ownership rights to the property. These data were divided into two sets, based on the form of ownership of the units for further analysis, and comparison of the results obtained for each set. Descriptive statistics were used to identify and characterize the data sets. Price trends were determined using a linear regression model in the form $y = ax + b$.

4. Results of the analysis

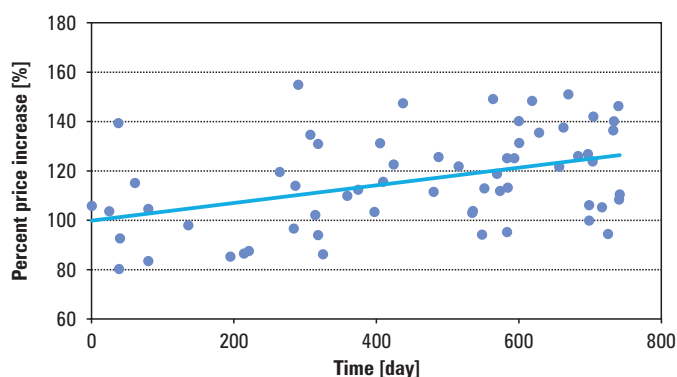
Since the transaction data study period covers two years, the analysis began by examining the price trend over the studied period [Bitner 2015]. Figures 4 and 5 present trend lines fitted to data for units with full ownership rights, and units with cooperative ownership rights, respectively. Trend lines, presented as percentages, were determined using the least squares method.

The trend line for units with full ownership rights over the two-year period under review (in Fig. 4) is obtained from the equation $y = 0.036x + 100$, $R^2 = 0.175$, which means that unit prices of residential units increased by an average of 0.036% per day, or 1.08% per month. For units with cooperative ownership rights, the trend line (in Fig. 5) is obtained from the equation $y = 0.035x + 100$, $R^2 = 0.113$, which means an average increase of 0.035% per day, or 1.05% per month. The resulting percentage unit price changes are very similar. This means that units with the two ownership types studied demonstrate very comparable increases in prices.

With price change indices determined, unit prices were updated to the date of the last transaction in the entire database, that is, August 26, 2022. Following that, basic statistics describing unit prices of units in the analyzed datasets were determined. The results are presented in Table 1.

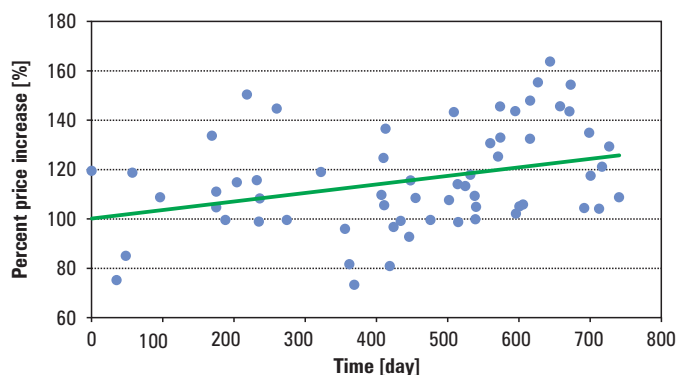
The obtained statistics, determined for the two analyzed data sets, have similar values. A positive but low skewness coefficient in both cases indicates a slight right-skewed asymmetry in the unit price distributions. In the case of asymmetric distributions, the median is a more appropriate measure of central tendency than

the arithmetic mean. In the analyzed data set, the median transaction price for units under separate (full) ownership is PLN 9,288.63, slightly higher than price for units under cooperative ownership, for which the median is PLN 8,985.83, but these results are still comparable. The unit price distributions for the two data sets are presented in Figures 6 and 7. These distributions have similar shapes. These are distributions with a slight right-skewed asymmetry, as indicated by the obtained skewness coefficient values presented in Table 1.



Source: Authors' own study

Fig. 4. Price trend for units with full (separate) ownership rights



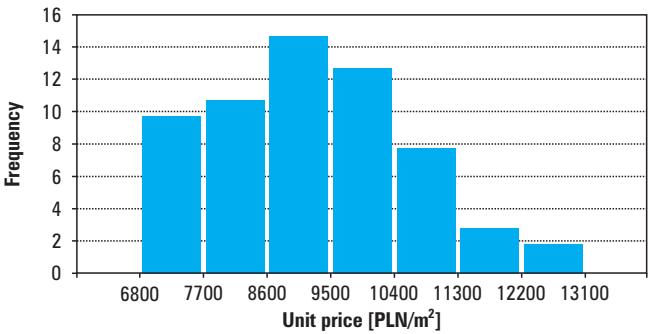
Source: Authors' own study

Fig. 5. Price trend for units with cooperative ownership rights

The usable area of the 123 units ranged from 22.8 m² to 68.8 m², with only 6 transactions for units exceeding 65 m² having been recorded. Table 2 presents the number of units and the average unit price determined for units in each usable area range. Due to the small number of transactions, units exceeding 65 m² were not included in the analysis. The last column of Table 2 presents the percentage difference between the average prices determined for the two forms of ownership.

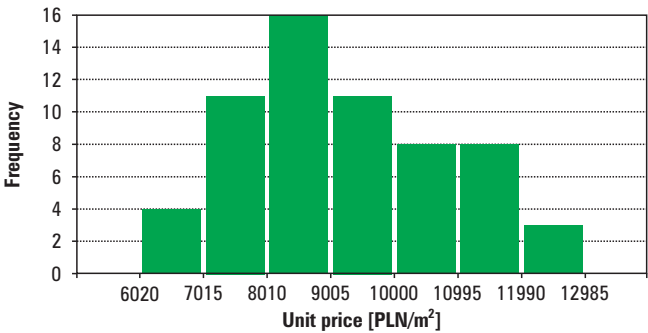
Table 1. Basic statistics describing unit prices of residential properties

Statistics	Ownership form of the residential unit	
	Full (separate) property ownership right	Cooperative ownership right to the residential unit
Mean	9259.21	9275.27
Standard error	181.54	199.92
Median	9288.63	8985.83
Standard deviation	1429.43	1561.41
Skewness coefficient	0.45	0.32
Set range	6222.13	6961.02
Minimum	6871.65	6020.03
Maximum	13093.78	12981.06
Set size	62	61



Source: Authors' own study

Fig. 6. Distribution of unit prices for units covered by full (separate) ownership rights



Source: Authors' own study

Fig. 7. Distribution of unit prices for units covered by cooperative ownership rights

Table 2. Number of units and their average unit prices according to usable area

Unit size – usable area [m ²]	Form of ownership of the residential unit				Price difference (per cent) $\frac{C_{spwl} - C_{wl}}{C_{wl}} \cdot 100$ [%]
	Full (separate) property ownership right		Cooperative ownership right to the residential unit		
	Number of units	Price (C_{wl}) [PLN/m ²]	Number of units	Price (C_{spwl}) [PLN/m ²]	
22–35	14	10144	17	10376	2.29
35–45	25	9310	13	9566	2.75
45–55	13	8813	17	8856	0.49
55–65	7	8398	11	8344	−0.64

The percentage price differences presented in the last column of Table 2 are small, not exceeding 3%, and have both positive and negative values. This means that buyers of residential units are willing to pay the same price for a unit with full ownership rights as for a cooperative ownership right to a unit.

Table 3 presents average unit prices for units by floor location, with the analysis limited to floors 1 to 5. To reiterate, the cooperative's stock includes 5- and 12-story residential buildings, therefore the majority of transactions, 69% to be precise, involved units located on floors 1 to 5. Above the 5th floor, the number of transactions was not sufficient to conduct a comparative price analysis.

Table 3. Average unit prices for residential units according to floor location

Floor	Form of ownership of the residential unit				Price difference (per cent) $\frac{C_{spwl} - C_{wl}}{C_{wl}} \cdot 100$ [%]
	Full (separate) property ownership right		Cooperative ownership right to the residential unit		
	Number of units	Price (C_{wl}) [PLN/m ²]	Number of units	Price (C_{spwl}) [PLN/m ²]	
1	13	9635	9	9329	-3.18
2	7	9235	10	9341	1.15
3	6	8419	8	8726	3.65
4	7	9136	11	9512	4.12
5	10	8912	4	8728	-2.06

It follows from Table 3 that the average unit prices of units located on various specific floors within the studied ownership types are comparable. The percentage price differences presented in the last column of the table have both positive and negative values. The maximum percentage price difference is slightly over 4%.

5. Conclusions

The selection of the Nowy Prokocim Housing Cooperative as the research area allowed for examining the impact of the form of ownership of residential units upon their prices. The analysis considered two forms of ownership: full (separate) ownership and cooperative ownership rights to the residential unit. The cooperative's housing stock is characterized by multi-family housing with a compact neighborhood structure, good infrastructure, and access to public transport. In order to eliminate the influence of differences resulting from the building's age and construction technology, only units located in buildings dating from 1975–1984, constructed using the same large-panel technology, were considered in the present analysis.

The analysis that we conducted revealed that the prices of units covered by full ownership rights and cooperative ownership rights to the property are comparable, and that they show a very similar upward trend over the two-year period under review. Average unit prices, depending on usable area and floor location, are also comparable. This means that real estate market participants treat these two forms of ownership in a similar way. This phenomenon can be explained, among other things, by limited awareness among market participants of the nature of cooperative ownership rights to the premises as a limited property right, as well as the fact that it is currently possible to easily convert this type of ownership right into the full (separate) ownership rights to the residential property.

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