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DOES THE APARTMENT'S WINDOW EXPOSURE IMPACT THE TRANSACTION PRICE?

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ABSTRACT

The aim of the study is to estimate the impact of the direction of window exposure on the unit price of an apartment using econometric methods. The data from the secondary market concerning transactions involving dwellings in G-15 buildings constructed using prefabricated technology in the 1960-70s were used. The study was conducted on data from 2015-2024 from 58 similar buildings located in Szczecin (Poland), where the exposure of the windows of the apartments was to the east or west. The results of the study are intended to capture certain regularities that will give insight into how the exposure of the apartment's windows to a given direction of the world influenced prices. The survey can help determine whether, given a choice between east-facing or west-facing windows of an apartment, one side of the world is better perceived by real estate market participants. The research hypothesis that east-facing windows increase the unit price of apartments is verified based on the observation of the secondary market for two-room apartments in buildings with exposure to two sides of the world (east and west). Differences between east and west exposure were tested. The research doesn't confirm that eastern exposure is associated with higher dwelling prices.

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1. Introduction

The exposure of the windows of a flat to the directions of the world determines the quantity and quality of sunlight reaching its interior, which directly affects the comfort of the inhabitants' lives. The sun has a positive effect on people's well-being and access to daylight sets the rhythm of our daily life.

In the northern hemisphere, apartments with southern exposure are usually the most desirable to buyers because they provide the most light throughout the day. North-facing apartments, on the other hand, are the least desirable, especially in countries with colder climates. East-facing or west-facing apartments, on the other hand, are a compromise.

Proper planning of the building's location on the plot in relation to the directions of the world is a challenge for every architect. Legal regulations, zoning plans, or the type and height of surrounding buildings are just some of the problems that architects all over the world face during the design phase. Designers must take into account the financial capabilities and requirements of the investor. Therefore, the direction of the windows in residential buildings in relation to the cardinal directions should be well thought out to ensure the well-being and comfort of the residents.

A southern window exposure provides the most daylight, but apartments with this exposure tend to experience elevated temperatures, especially in the summer. A northern exposure provides the least amount of daylight, which can be less attractive to potential buyers. On the other hand, east and west exposures offer morning or afternoon light, which can be either an advantage or a disadvantage for the residents of a given apartment.

Apartments with east-facing windows receive morning light, which can be beneficial for people who like natural light in the morning. In the summer, these apartments are less likely to heat up excessively during the day, which can be an advantage. These apartments may be appealing to people who appreciate cooler afternoons and evenings. On the other hand, apartments with west-facing windows are brighter in the afternoon and evening, which can be an advantage for people returning from work, who want to enjoy natural light. In the summer, these apartments can get hotter, especially on higher floors and in buildings with

large windows. This can also lead to higher air conditioning or cooling costs.

Ensuring the optimal amount of daylight reaching rooms intended for permanent human habitation is a result of the legal regulations in force in a given country. The laws that apply to the above subject matter in Poland include The Construction Law Act of July 7, 1994 and the Regulation of the Minister of Infrastructure of April 12, 2002 on the technical conditions to which buildings and their location should conform.

This study is attempting to identify the impact of the exposure of apartment windows to the cardinal directions on the transaction price, where differences between east and west exposure were tested.

The impact of window orientation on property prices has been a subject of extensive research in various geographical regions worldwide. The results of the study (Bas, 2024a) indicated that buyers value apartments with an eastern exposure more than those with a western exposure. The survey demonstrated that for single-sided apartments with east or west exposure, potential buyers valued apartments with eastern exposure more. On average, the price of apartments with east-facing windows is 12.13% higher than the price of apartments with west-facing windows. Furthermore, the survey indicated that apartments situated against the north wall of the building exhibited a 10.18% decrease in cost compared to other units. This shows that access to daylight may be important for real estate market participants.

A study conducted on secondary market data in Beijing proved that apartments in historical urban areas are more sensitive to orientation. Buyers are willing to pay the most for apartments oriented exclusively to the south, whereas west-oriented apartments are the most disliked units, with a 7.8% discount compared to their south-oriented counterparts (Song et al., 2019). In Shanghai researchers confirmed the first above finding. Buyers were willing to pay 7.2% more for south-facing apartments (with high levels of sunlight), relative to those north-facing (without direct sunlight) (Zhong et al., 2022). Another study shows that a south orientation is associated with an average premium of 14% in property value and from all the possible orientations, the south-facing view reflects the highest price (Lu, 2018).

However researchers in New Zealand found that, after controlling for neighborhood characteristics and house attributes, purchasers are willing to pay a premium of approximately 2.4% of the total house value, on average, for an additional daily hour of sunlight across the year, regardless of the suburb in which they choose to take up residence (Fleming et al., 2017). The orientation of a house is a significant factor in determining its value. The study conducted in San Diego shows that houses oriented directly on an east-west axis command a premium over houses oriented on a north-south axis (Ma & Narwold, 2019).

International research on lighting in residential buildings was conducted in Poland, Turkey, Sweden, and the United Kingdom (Aslanoğlu et al., 2021, 2023). The aim was to collect self-assessments from users in order to better understand their needs and problems related to lighting in residential buildings. The research revealed significant differences between seasons. In addition, it was shown that the ratio of window area has a greater impact on satisfaction with daylight in countries with longer winters. There were also seasonal differences in the correlation between artificial light factors and satisfaction. The use of artificial light is generally higher in winter, especially in Poland and Sweden. The COVID-19 pandemic, which has caused work and learning to be moved to homes, has highlighted the importance of lighting quality in dwellings as multifunctional spaces.

The orientation of a window can be just as important as the view it offers and nearby areas. Therefore, the surroundings of a property are also very important to potential buyers. (Panduro & Veie, 2013) addresses the impact of urban green spaces on housing prices using data from Aalborg, Denmark. The key findings indicate that the impact of green space on housing prices varies significantly depending on the type, for instance proximity to parks is associated with significantly higher prices for both houses and apartments. In contrast (Wen et al., 2017) investigates the spatial effect of the river landscape, specifically the Grand Canal, on housing prices in Hangzhou, China. Among others findings, it was stated that accessibility to the canal significantly impacts housing prices and the positive effect on housing prices gradually increases with distance, peaks in the 0.5 km to 1.5 km segment, and then significantly decreases when the distance exceeds 3 km. While the study from Hong Kong indicated that neighborhood parks could raise price by 16.88%, including 14.93% for availability and 1.95% for view. A comparison of various landscape elements reveals that neighborhood parks have the greatest impact on the intention to invest in home purchases. (Jim & Chen, 2010). Aslanoğlu et al. (2025) noticed that urban greenery is part of urban

development, but unfortunately receives less attention. Spatial constraints, structural requirements and the need for interdisciplinary cooperation make integrating green spaces into urban areas apparent a very complex problem.

In summary, the price of real estate can depend on many factors for instance (Cellmer et al., 2024). This was confirmed, among other things, in a study that focused on assessing the significance of residential property features based on the preferences expressed by selected groups of real estate market participants (Sajnóg & Jaskólska, 2025).

For the purposes of this study, data on transactions in G-15 buildings constructed in prefabricated technology in the 1960s and 1970s in Szczecin were used. In construction, prefabrication involves the production of construction elements or building modules under controlled factory conditions. The elements are then transported to and assembled on site. Early forms of prefabrication can be observed in ancient times (Krajewska et al., 2025). To this day, prefabricated buildings are still a permanent feature of the landscape in almost all Polish cities. Prefabricated buildings have a long history, and the Domino building concept from 1914 by Le Corbusier is considered to be the beginning of large-scale concrete prefabrication. The development of large-panel construction in Poland was particularly intensive in the 1970s and 1980s. Unfortunately, the buildings erected during this period are not viewed positively in popular opinion. This is mainly due to the functional and utility solutions of the buildings and apartments, which were the result of the design standards in force at the time, the use of inappropriate materials, elements and products, especially finishing and installation elements, as well as poor workmanship (Runkiewicz et al., 2020). Many consider this type of construction to be second-rate, even though most of the resources have already been renovated and thermally modernized. The lifespan of these buildings is also important (Putek-Szeląg & Ziembicka, 2016).

The residential real estate market depends on the purchasing power of potential buyers, which is usually based on their creditworthiness. The increase in interest rates in 2022 significantly reduced the number of loans granted in Poland. The Safe Credit Program 2%, launched in 2023, temporarily increased creditworthiness. However, its termination led to a further drop in the number of loans in 2024 (Nawrocka, 2025).

Nevertheless, it turns out that apartments in prefabricated buildings from the last century were and still are in demand today. This is mainly due to the fact that the housing estates, designed according to architectural and urban planning principles of the time, were intended to be open spaces with access to social infrastructure. Another advantage was their location, access to good public transportation. The functional layout with space-saving rooms is an advantage that cannot be overestimated. This is proven by the numerous transactions in this market, not only with ordinary individuals buying, for example, their first apartment to meet their housing needs, but also with flippers on the market.

The real estate markets are often local. They can form so-called micro-worlds that sometimes have their own rules. For this reason, it is necessary to observe global trends at the level of individual real estate markets. Only an analysis of more data, and thus of different cities and countries, will give a full picture of the impact of the location of windows in apartments on real estate prices.

The aim of this study is to use econometric methods to estimate the impact of the direction of window exposure on the unit price of a flat. The research hypothesis is that east-facing window exposure leads to an increase in the unit price of flats.

2. Material and methods

The objective of the study was to assess the impact of the location of windows in residential apartments in relation to the sides of the world (east and west) on unit prices in 2015-2024. An econometric model was applied and information on market transactions concluded on the secondary market was used.

This model posits that a heterogeneous commodity has several characteristics. The demand of consumers for goods depends on the inherent characteristics of a commodity. The combination of these features influences the utility, preferences, and choices of consumers (Lancaster, 1966; Rosen, 1974). Dwellings are a typical heterogeneous commodity, and the direction of window exposure can be an important factor that affects the housing choices of consumers. East-facing or west-facing windows of apartments are capitalized into housing price and can be assessed with a hedonic price model.

The Python programming language was employed for the execution of calculations, with the dependent variable being the logarithm of the price per square meter of residential unit area. The Ordinary Least Squares regression (OLS) method was employed to analyze the data. The same calculation method was used as in the previous study due to the similarity of

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the research material and in order to compare the results obtained.

Fig. 1. Example of the appearance of a building from the four directions of the world. *Source:* own study.

Dwelling transactions in G-15 buildings were selected for the study. This is the most characteristic

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building from the late 1960s and early 1970s in Western Pomerania due to the number of subsequent repetitions. It was originally designed for a building complex at the intersection of streets in the Downtown district of Szczecin. The G-15 building is a point block with a corridor floor plan. The buildings were replicated many times in projects in other cities in Western Pomerania and entered the regional catalog of repetitive objects with the symbol [R2-016] (Bal et al., 2022) (Figure 1).

This study was conducted on data from 58 buildings in one of the largest Polish cities, Szczecin. Buildings were located in three districts: North, Downtown and West, and the windows of the apartments faced only east or west. Only three buildings were located in the North District, and they were close to the border of the Downtown District. For the purposes of the study, these buildings were grouped with the Downtown district buildings.

Compared to the previous research material, the buildings differ in the layout of the apartments on each floor and the location of the elevators and staircases. The buildings are accessed from the north side. On the east side, there is a garbage chute and two elevators. On the west side, there is a staircase. Directly in front of the entrance to the building, there is a corridor with six apartments, with three apartments on each side of the corridor. There is a window in front of the corridor to provide light.

On the eastern side of the corridor, the first two apartments, counting from the north side, are two-room apartments. The next apartment on this side of the corridor has three rooms and also faces the south wall and has a balcony. On the other side of the corridor, i.e. on the west side, the situation is similar, as shown in Figure 2.

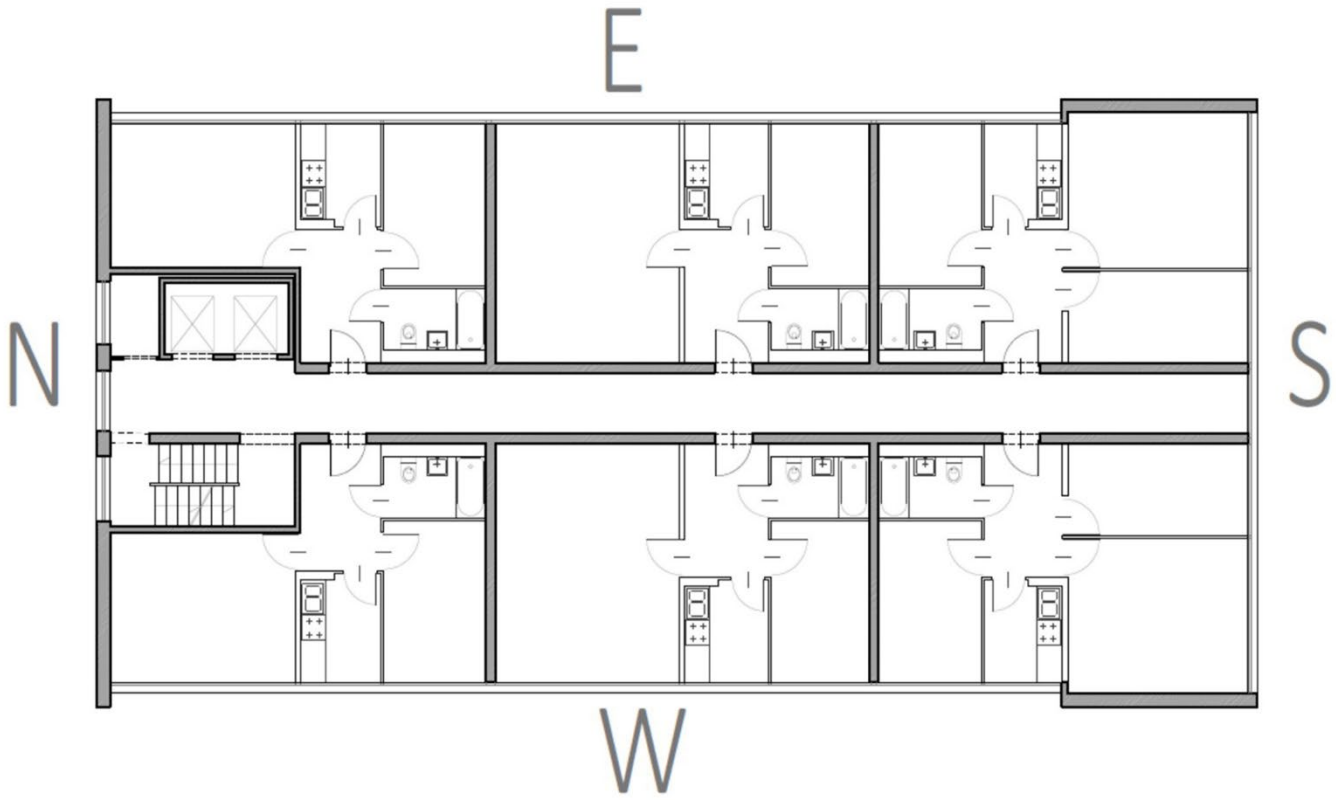

Fig. 2. Plan of the repetitive floor. *Source:* own study.

The floor plans of the apartments on either side of the corridor are similar. The two-room apartments adjacent to the north wall have a smaller usable area (from 35.44 to 39.01 m^2). The middle two-room apartments, on the other hand, are larger (from 45.06 to 47.90 m^2). All buildings included in the analysis have 11 floors. The layout of the apartments in the buildings from the ground floor to the 10th floor is identical. Only the last floor (11th) has a different room layout. Therefore, due to the lack of similarity to the floor layout below, sales transactions of apartments on the 11th floor were excluded from the study. Similarly, observations regarding the three-room apartments were excluded from the study.

The apartments used in the study had two rooms and faced only east or west. The area and window

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orientation of the dwellings, as well the location of apartments on floors, were also studied. The research material included transactions concerning ownership rights and cooperative rights to residential premises, which were also the subject of the study. The occurrence of repeat sales of the same apartments was identified in the dataset. Therefore, the occurrence of a sale of such an apartment within 12 months of the initial purchase was qualified as a property flipping transaction.

All buildings that were analyzed are located in well-connected parts of the city with access to public transportation. They are part of larger housing areas that have been successively expanded. The immediate neighborhood of the buildings is quite similar, which was typical for the time they were built.

Good transport accessibility usually means that the buildings are close to roads with heavy traffic. This, in turn, means that traffic noise can be more noticeable for residents. Some buildings are also located near railway or tram lines, which makes them potentially exposed to rail noise. Other buildings are located close to parks or green areas. Finally, the buildings in one of the administrative districts are located in an industrial noise impact zone.

In order to take into account the distance from the city center, the study determined the distance in a straight line from each of the analyzed buildings to Brama Portowa, which is considered one of the central points of the city of Szczecin.

The buildings were constructed in the 1960-70s and are currently in a similar technical condition, therefore this feature was not considered. Nevertheless buyers often raise the issue of thermal comfort. This is very important under the current legal conditions regarding thermal modernization of buildings. Thanks to the new central registry of energy performance certificates for buildings, they are now accessible online. Certainly, access to an additional source of information about the property currently improves the negotiating situation of market participants. Unfortunately, it was not possible to use the data from the system directly in the study, as it has only been operating for a short time, and the study covered transactions from 2015.

In summary, a total of 464 observations were included in the study. The survey included such characteristics as: the year of the transaction (from 2015 to 2024), area, east/west facing orientation, ownership, flipping, location on the floor, green neighborhood, rail noise, industrial noise, distance from the city center, location in the district. The variables that are suitable for examination by characteristic states are described in Table 1.

The initial stage of the research involved conducting a statistical analysis of the market characteristics of the properties included in the study. The subsequent stage in the process was the introduction of zero-one variables for each property's quantitative attribute state (except for the distance from center variable). Then an exponential linear regression model was estimated. A logarithm of the unit price of real property was designated as the dependent variable.

The structure of the model is as follows:

$$\ln(Y) = \alpha_0 + \alpha_1 year2016 + \alpha_2 year2017 + \alpha_3 year2018 + \alpha_4 year2019 + \alpha_5 year2020 + \alpha_6 year2021 + \alpha_7 year2022 + \alpha_8 year2023 + \alpha_9 year2024 + \alpha_{10} area + \alpha_{11} east + \alpha_{12} ownership + \alpha_{13} flipping + \alpha_{14} floor + \alpha_{15} green + \alpha_{16} rail\_noise + \alpha_{17} industrial\_nosie + \alpha_{18} distance + \alpha_{19} location + u \quad (1)$$

where:

ln(Y) - the natural logarithm of the unit price of housing; $\alpha_0, \alpha_1, \alpha_2, \ldots, \alpha_k$ - model parameters; *u* - error term;

The explanatory variables are shown in Table 1.

Table 1

Summary statistics of variables in the estimation

No	Attribute	Attribute variant	Explanation	Variable name
1	year2016	0 1	transaction year	y2016
2	year2017	0 1		y2017
3	year2018	0 1		y2018
4	year2019	0 1		y2019
5	year2020	0 1		y2020
6	year2021	0 1		y2021

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7	year2022	0		y2022
		1		
8	year2023	0		y2023
		1		
9	year2024	0		y2024
		1		
10	dwellings area	0	bigger flats	area
		1	smaller flats	
11	east facing dwellings	0	facing west	east
		1	facing east	
12	property right	0	cooperative	ownership
		1	ownership	
13	property flipping	0	not classified	flipping
		1	classified	
14	location on floor	0	from ground floor to 4th floor	floor
		1	from 5th to 10th floor	
15	green neighborhood	0	lack of parks or green areas in neighborhood (up to 300 m)	green
		1	parks or green areas in neighborhood (up to 300 m)	
16	rail neighborhood	0	building potentially exposed to railway or tram noise	rail_noise
		1	building not exposed to railway or tram noise	
17	industrial areas neighborhood	0	building potentially exposed to industrial noise	industrial_noise
		1	building not exposed to industrial noise	
18	distance from the city center	quantitative attribute	distance from the city center in km	distance
19	location in city district	0	building located in West district	location
		1	building located in Downtown/North district	

Source: own study.

Table 2 shows basic descriptive statistics for quantitative characteristics.

Table 2

Summary statistics of quantitative variables

	price per sqm [PLN]	distance [km]
minimum	3 119,07	1,087
first quartile	4 458,27	2,284
median	5 903,23	2,781
average	6 040,83	2,724
third quartile	7 453,82	3,203
maximum	11 591,15	5,283

Source: own study.

Table 3

Structure of data in the study period

Year	Observations	East View	West View
2015	34	14	20
2016	46	22	24
2017	39	10	29
2018	57	28	29
2019	41	19	22
2020	48	31	17
2021	59	26	33
2022	47	15	32
2023	55	20	35
2024	38	21	17
Total	464	206	258

Source: own study.

3. Results

The model was constructed for the purpose of interpretation, with the objective of assessing the strength of the observed effect, the direction of the relationship between the variables, and the statistical significance of the observed data. The OLS method was complemented by a Lasso regression model with regularization. The strength of the regularization was optimized. When alpha is set to 0.0001, the parameter for the east variable is 0.0026. Furthermore, the mean square error (MSE) is 0.0169, and the R-squared is 0.8128. Subsequent to the implementation of the Lasso regression model, the parameter associated with the "east" variable was found to be equivalent to that of the multiple regression model. Consequently, the further exploration of more sophisticated models was discontinued.

The first version of the model did not meet the objectives of the study. Hence, using the so-called backward stepwise regression, variables were gradually eliminated so as to keep the model with the highest value of the coefficient of determination while maintaining the significance of the parameters. The level of significance was defined as for $p<0.05$. In the end, the following variables remained in the model: y2018, y2019, y2020, y2021, y2022, y2023, y2024, area, flipping, and green. The results of the baseline and final

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model estimation are presented below.

Information about the fit of the created final model is provided in Table 5.

Table 4

Parameters of the estimated models

Baseline / Final	Coefficient		Standard error		t		P>|t|	
intercept	8.2474	**8.2546**	0.043	**0.015**	190.975	**556.262**	0.000	**0.000**
y2016	0.0637		0.031		2.078		0.038	
y2017	0.0924		0.032		2.910		0.004	
y2018	0.2302	**0.1710**	0.029	**0.022**	7.877	**7.881**	0.000	**0.000**
y2019	0.3128	**0.2623**	0.031	**0.025**	9.982	**10.650**	0.000	**0.000**
y2020	0.4732	**0.4181**	0.031	**0.023**	15.510	**18.132**	0.000	**0.000**
y2021	0.5414	**0.4889**	0.029	**0.022**	18.464	**22.458**	0.000	**0.000**
y2022	0.6691	**0.6133**	0.031	**0.023**	21.800	**26.174**	0.000	**0.000**
y2023	0.6797	**0.6224**	0.030	**0.022**	22.935	**28.100**	0.000	**0.000**
y2024	0.8153	**0.7604**	0.032	**0.025**	25.193	**30.053**	0.000	**0.000**
area	0.0828	**0.0849**	0.013	**0.013**	6.443	**6.635**	0.000	**0.000**
east	0.0026		0.013		0.199		0.842	
ownership	-0.0161		0.014		-1.189		0.235	
flipping	0.1081	**0.1087**	0.022	**0.022**	4.835	**4.845**	0.000	**0.000**
floor	0.0215		0.013		1.687		0.092	
green	0.0319	**0.0286**	0.018	**0.014**	1.784	**2.053**	0.075	**0.041**
rail_noise	-0.0155		0.014		-1.084		0.279	
industrial_noise	-0.0189		0.028		-0.668		0.505	
distance	-0.0111		0.010		-1.161		0.246	
location	-0.0294		0.020		-1.449		0.148	

Source: own study.

Table 5

Model fit:

Dep. Variable:	ln price per sqm	R-squared:	0.805
Model:	OLS	Adj. R-squared:	0.801
Metod:	Least Squares	F-statistics:	186.9
No. Observations:	464	Prob (F-statistic):	8.70e-154
Df Residuals:	453	Log-Likelihood:	278.51
Df Model:	10	AIC:	-535.0
Covariance Type:	nonrobust	BIC:	-489.5

Source: own study.

Table 6

Variable	y2018	y2019	y2020	y2021	y2022	y2023	y2024	area	flipping	green
VIF	1.303980	1.255410	1.267543	1.351742	1.284509	1.317523	1.236928	1.051438	1.064158	1.039715

Source: own study.

The White's test statistic is 50.7409 and the corresponding p-value 0.0324. The residuals are heteroscedastic. The variance inflation factor (VIF) was calculated (Table 6).

Given that almost each of the VIF values for the explanatory variables in the regression model are between 1 and 2, multicollinearity is not a problem in the study. The Runs test value is -0.790 and the corresponding p-value is 0.430.

We have sufficient evidence to say that the model specification is correct.

The model parameters were estimated using the least squares (OLS) method. The model was built on the basis of 464 observations. The relationship between the logarithm of the price per 1 sqm and the individual characteristics that constituted the independent variables was determined. The model shows a good fit (R-squared = 0.805), which means that about 80.5% of the variation in the logarithm of prices can be explained by the included independent variables. Adj. R-squared is 0.801. On the other hand, the p-value in the F-test is Prob (F-statistics) = 8.70e-154, which means that the analyzed variables have a significant effect on the unit price.

Despite the large number of observations (464), this paper did not confirm the hypothesis put forward at the beginning of the study, according to which the exposure of windows to the east increases the unit price of a dwelling. It should be noted that only two-room apartments were analyzed in the current study. In

contrast, the previous study included one-room and two-room apartments, which could have had an impact on the result obtained.

4. Discussion

The survey does not confirm that eastern exposure is associated with higher dwelling prices. In the literature review one study was noted that focused only on the exposure of the apartment to the directions of the world, such as east and west, where the price apartments with east-facing windows was, on average, 12.13% higher than the price of apartments with west-facing windows (Bas, 2024a). Most of the available studies, however, refer to south-facing dwellings (Lu, 2018; Song et al., 2019; Zhong et al., 2022). Researchers have observed a positive impact on housing prices for apartments located near green areas (Jim & Chen, 2010; Panduro & Veie, 2013; Wen et al., 2017), which may also be due to the view from the apartment window.

The limitation of this study is that not all data from the buildings that were the subject of the analysis were used. Data on three-room apartments were not used. From the researcher's point of view, however, it was necessary for the unit under study to be as similar as possible (two-room apartments).

The model also attempted to examine many other features that could potentially affect the unit price. The parameter for "area" feature turned out to be significant, i.e. smaller apartments are more valued by buyers. On average, the price of small apartments is 8.86% higher. Therefore, the demand for them could naturally be higher than for larger apartments because buyers generally evaluate real estate based on the total cost, rather than the price per square meter.

The occurrence of repeated sales of the same apartments was noticed. An attempt was made to take into account the fact of repeated trading in apartments (so-called flipping), with the parameter for this feature turning out to be significant. Also the positive impact of the proximity of green spaces to the analyzed buildings was noted. The parameter for the "green" feature proved to be significant. This study confirms that green spaces are appreciated in the urban fabric.

The parameter for the "ownership" variable, on the other hand, proved to be irrelevant. In Poland, ownership provides greater benefits, yet Polish law allows non-EU citizens to purchase cooperative rights in border areas. That is why since 2022 the demand for this right has been noticed among citizens from outside the European Union and an influx of refugees to Poland led to an increase in prices and rents (Bas, 2024b; Gluszak & Trojanek, 2025; Trojanek & Gluszak, 2022).

Also the parameter for the "floor" feature regarding the location on the floor has proven to be irrelevant. Perhaps in the dense urban fabric in the types of buildings that were the subject of the study, this feature is not considered by buyers. The feature should definitely be examined in more detail in future studies.

The absence of the significance of suchparameters for features as "rail_noise", "industrial_noise", "distance", "location", i.e. those related to the immediate neighborhood and the location aspect, may be perceived as somewhat unexpected. Analyzing the spatial layout of the city, the location of buildings in its individual parts and access to urban infrastructure, it can be concluded that the buildings under analysis have a similar neighborhood. This "microclimate" of the location probably meant that potential buyers did not pay attention to the location in the city district, the distance to the center or possible road or rail noise.

It should be noted that the study did not consider the technical condition of the dwellings, which has a significant impact on prices. The reason was obvious. Unfortunately, it is difficult to access information about the individual states of this feature. It is practically impossible to gather knowledge for all properties regarding their technical condition at the time of sale.

The negotiation capacity of the parties was an additional piece of information that could not be identified. The identification of this phenomenon is particularly challenging. Furthermore, it is also difficult to determine whether the price agreed in the transaction was not, for example, the result of price anchoring (Doszyń & Kokot, 2024).

The results of this study can be used by both real estate market specialists and potential participants. The knowledge gained can be the next step towards new considerations, especially among real estate experts, about the characteristics that influence prices and the precision of real estate valuation. The expert knowledge can significantly improve the estimation results of econometric models in the case of low data quality (Doszyń, 2024).

This study should be a prelude to further research on the observation of the housing market in prefabricated buildings. This is due to the fact that the obtained results should be verified in other parts of the city with a similar housing substance. The next step should be research conducted in other cities in Poland.

5. Conclusions

The study used transaction data on the sale of apartments in buildings where the apartments on the

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east and west sides were very similar. Dwellings differed in their exposure to the cardinal points (east/west), their size, as well as characteristics that we are unable to read from the data obtained, such as the technical condition and the negotiating power of the parties.

The research does not confirm that eastern exposure is associated with higher dwelling prices. This finding contradicts a prior study, cited in the literature review, that identified the east-facing side as the more popular choice among buyers. Further studies on transactions in similar buildings and buildings with different structures are needed to solve this issue.

It is possible that the above results are influenced by the fact that real estate prices were rising during the period under review, and properties in this market segment were selling quite quickly. Thus, the choice among offers on the market was limited. Potential buyers did not have enough time to consider their additional preferences, which they might have taken into account under different circumstances.

The study was conducted using an econometric model, which allowed for the analysis of the impact of selected characteristics on the unit price. The model did not explain 100% of the market variability, however, looking at the value of the R-squared statistic = 0.805, it can be assumed that yet another important characteristic should be included in the model. For comparison in a study (Bas, 2024a), the result obtained was R-squared = 0.698.

The positive effect of a location near urban green spaces was noted. On average the price for flats located in buildings near green areas is 2.90% higher. This study confirms the positive impact of green spaces on the value of residential properties.

The observed phenomenon of flipping should also be mentioned. A number of transactions were noted that showed signs of flipping, and the feature's parameter was important for the estimation model. In future studies, the author will try to take a closer look at this subject as it accompanies the real estate market and is worth investigating.

The study shows that real estate appraisers can try to look at this type of property from a different perspective, e.g. by revising the set of characteristics that influence the price and trying to include new characteristics in the market analysis. In turn, real estate agents can use the collected knowledge when setting offer prices for apartments in similar buildings.

The results provide valuable insight into the current state of knowledge regarding the perception of window exposure in dwellings, especially in prefabricated buildings from the 1960s and 1970s located in similar neighborhoods on housing estates.

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