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Determinants of Real Estate Prices in Kazakhstan

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Abstract

The study analyzes the determinants of residential real estate prices in the Republic of Kazakhstan based on data from apartment sale listings posted on the website krisha.kz. The dependent variable used is the logarithm of the price per square meter. To assess the impact of property characteristics and locational factors, multiple linear regression models with robust standard errors are applied, which allows for accounting for the presence of heteroskedasticity.

The results indicate a significant influence of a city's status as a city of republican significance, building type, ceiling height, building age, the apartment's status as a former dormitory, and the stage of construction completion. A separate analysis for the cities of Astana and Almaty reveals pronounced spatial differences in price formation. In Astana, key factors include proximity to the Ishim River banks, closeness to parks, and accessibility to shopping and entertainment centers; in Almaty, the relevant factors are the city district, location relative to Al-Farabi Avenue, and distance to the nearest metro station.

The findings confirm the importance of considering both property characteristics and locational factors when analyzing residential housing prices in Kazakhstan.

Keywords: *housing market in Kazakhstan, hedonic model, real estate prices.*

JEL-classification: *R3, R31*

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1. Introduction

The residential real estate market is one of the key segments of the economy, exerting a significant influence both on the welfare of the population and on macroeconomic stability. Housing prices reflect the combined impact of numerous factors-from the characteristics of the properties themselves to the spatial features of the urban environment. In the context of urbanization and increasing economic activity in Kazakhstan's largest cities, issues related to housing price formation in the real estate market are becoming particularly relevant.

Changes in real estate prices can influence consumer behavior and investment activity. In this regard, analyzing the determinants of housing prices makes it possible to better understand the structure of the market and to identify the key factors shaping its dynamics.

Existing literature on this topic highlights the importance of both structural characteristics of real estate properties (such as size, age, and building type) and locational factors (such as proximity to infrastructure, transport accessibility, and natural amenities). However, for Kazakhstan, empirical studies in this area remain limited.

This study aims to address this gap and focuses on analyzing the determinants of housing prices in the residential real estate market of the Republic of Kazakhstan. The analysis uses data from apartment sale listings posted on the platform krisha.kz. The results show the significance of factors such as whether a city has the status of a city of republican significance, ceiling height, whether the apartment was formerly a dormitory, and whether construction had been completed at the time of observation.

In addition, the analysis is conducted separately for the cities of Astana and Almaty. In Astana, the key locational determinants include whether the apartment is located on the left or right bank of the city, proximity to parks and shopping and entertainment centers, as well as distance from the embankment. Among property characteristics, ceiling height, monolithic building type, former dormitory status, and expected completion in 2026–2028 have a significant impact.

In Almaty, the most important locational factors are the district in which the apartment is located, its position relative to Al-Farabi Avenue (above or below), and the distance to the nearest metro station. Ceiling height and the planned commissioning of the property in 2026–2028 also have a significant effect.

The study consists of several sections. The first chapter provides an introduction. The second chapter presents a review of the relevant literature. The third chapter describes the data collection process and the methodology employed. The subsequent section reports the model results for the entire country, as well as for the cities of Astana and Almaty. The final section outlines the main conclusions of the study.

2. Literature Review

The hedonic pricing methodology proposed by Rosen (Rosen, 1974) laid the foundation for the quantitative assessment of the contribution of individual characteristics to real estate values. Hedonic regression is widely used to analyze the combined effects of structural, qualitative, and locational factors that determine a property's market price. In housing market research, this approach models the price of a real estate property as a function of its characteristics, where the dependent variable is the housing price and the explanatory variables represent various property attributes. This method is extensively applied in the urban economics literature to examine housing demand. Previous studies demonstrate that housing prices are significantly influenced by property characteristics. Key factors include dwelling size, building age, number of rooms, housing type, and number of floors. Ligus and Peternek (2016), in their study of the housing market in Wroclaw, find that house size, the presence of a garage, number of rooms, floor level, and building age are statistically significant determinants of housing prices. In an analysis of the housing market in Istanbul, Keskin (2008) shows that building age, number of floors, size, as well as the presence of a swimming pool and a garage, are statistically significant at the 1% level. Bible and Hsieh (1996), examining the rental housing market in Shreveport, demonstrate that apartment age and size significantly affect rental price per square meter. Among locational factors, distance to a college is statistically significant, whereas distance to a supermarket is not. In lower-income countries, access to utilities substantially increases housing attractiveness. For instance, Choumert, Stage, and Uwera (2014) note that in Kigali, the presence of piped water supply within a dwelling raises rental prices, as installation costs are high and many households cannot afford them.

The authors of the article "Real Estate Prices in Mumbai: Does the Metro Rail Have an Impact?" (Gandhi et al., 2014) examine the determinants of residential property prices in Mumbai using a log-linear OLS model in which the dependent variable is the logarithm of price in Indian rupees per square meter. Their findings indicate that housing prices are significantly influenced by distance from the central business district, proximity to the western coastline, the presence of slums, the share of residential and commercial development, and proximity to a railway station. In contrast, amenities and open spaces do not have a statistically significant effect on prices. Additionally, the authors assess the impact of the planned metro line on the real estate market and conclude that the anticipated metro opening does not have a significant effect on housing prices.

In the paper "The Impact of Rail Transport on Real Estate Prices: An Empirical Analysis of the Dutch Housing Market" (Debrezion, Pels & Rietveld, 2011), the authors examine the effect of railway accessibility on housing prices using a log-linear hedonic pricing model estimated on transaction data from three Dutch urban agglomerations: Amsterdam, Rotterdam, and Enschede. Railway accessibility is measured both by distance to a station and by an index of railway service quality. Two types of stations are considered: the nearest station and the station most frequently used by residents. Controlling for a wide range of factors, the authors show that the model based on the most frequently chosen station outperforms the model using the nearest station in estimating the effect of railway accessibility on housing prices. Moreover, the differences between the two approaches increase with the level of urbanization of the agglomerations under study. In the context of the present research, it is therefore of interest to examine how proximity to metro stations in Almaty affects housing prices.

The authors of "A Spatial Hedonic Analysis of the Value of Urban Land Cover in the Multifamily Housing Market in Los Angeles, CA" (Li & Saphores, 2012) investigate the impact of different types of urban vegetation cover on the value of multifamily housing in Los Angeles. Their main finding is that an increase in the share of lawns on a parcel or in its immediate surroundings generally does not raise the value of multifamily properties, and greater tree coverage within the parcel itself also has no noticeable effect. By contrast, for most properties, a positive effect is observed when tree cover increases in the surrounding neighborhood (outside private parcels). It would be particularly relevant to examine how proximity to parks affects apartment prices, especially in Astana, where the level of urban greening is relatively low.

In the Kazakhstani context, several studies have also addressed the residential real estate market. For example, Mynbaev and Ibrayeva (2011) analyze the determinants of housing prices in Almaty using a hedonic approach. The authors examine a sample of approximately 2,500 residential properties across seven districts of the city, compiled from newspaper advertisements. The key pricing factors identified include housing size, quality, and location. The estimation results indicate the presence of a price bubble in 2006–2007, as well as substantial price differences across districts and a strong dependence of housing value on quality and floor level. A negative effect of corner location and first-floor placement on price is also reported. However, the study is limited to a single city and does not cover the housing market of Kazakhstan as a whole.

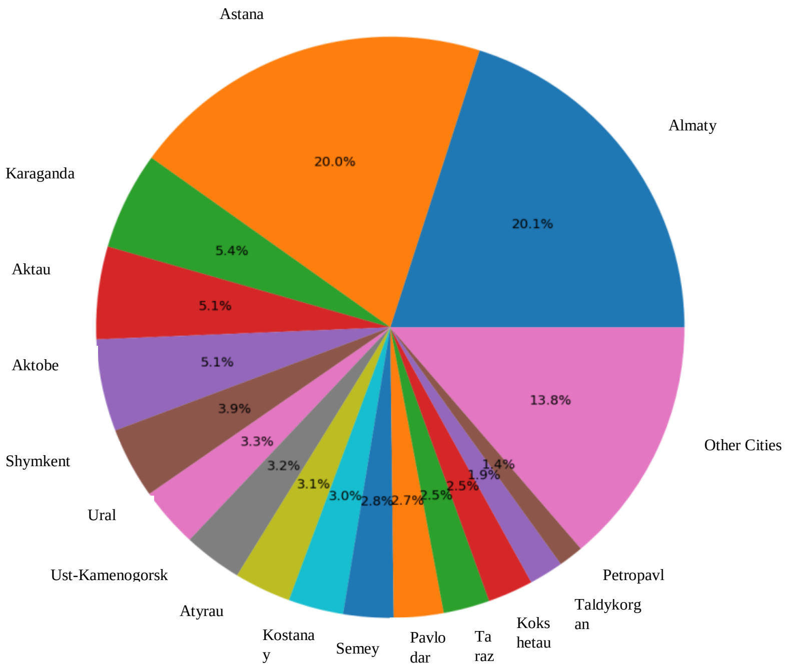
3. Data and Methodology

3.1. Data

The data used to construct the model were collected from the website krisha.kz between June and August 2025 and include 230,667 listings of all available apartments. Since sellers independently report property characteristics, the dataset contained a substantial number of missing values. After selecting the relevant variables, the sample size decreased to 149,708 apartments. The final dataset includes such variables as floor level, total area, former dormitory status, possibility of exchange, year of construction, locality, ceiling height, price, building type, and geographic coordinates (longitude and latitude). Several data transformations were performed. Prices were converted into price per square meter and then transformed into logarithms to facilitate interpretation. The variables “former dormitory,” “exchange possible,” and “building type” were converted into dummy variables. Additional dummy variables were created for “first floor” and “top floor.” Building age was calculated as the difference between 2025 and the year of construction. For properties scheduled for completion after 2025, a dummy variable (under_construction) was introduced. To analyze price differences between cities of republican significance and other localities, dummy variables for Astana, Almaty, and Shymkent were constructed. Three models were estimated within the study: a nationwide model and separate models for Astana and Almaty.

To prepare the national model, outliers were removed: apartments with ceiling heights above 4 meters and below 2 meters, the 0.5% of apartments with the smallest and largest floor areas, as well as apartments built before 1950. This made it possible to clean the data of extreme values. As a result, the number of apartments in the dataset decreased by 2,347 and now amounts to 147,361 properties. Chart 1 presents the distribution of apartments in the dataset. More than 40% of the observations are concentrated in Astana and Almaty. Although Shymkent is also a city of republican significance with a population exceeding one million, the number of apartments listed for sale there is substantially lower than in some smaller cities. This imbalance can be explained by the fact that a significant share of Shymkent’s housing stock consists of detached private houses, data on which were not collected in this study. A similar pattern is observed in the southern regions of the country; therefore, they are not displayed in the figure.

Chart 1. Distribution of Apartments by Locality



Source: *Krisha.kz, author's calculations.*

The average apartment size is 64.7 square meters, while the median size equals 59 square meters. The median age of apartments is 15 years, whereas the mean age is 23 years. The dataset includes 37,736 apartments built since 2021, accounting for 25.6% of the total sample. There are also 1,997 apartments that were previously classified as dormitories. The vast majority of properties were constructed before Kazakhstan gained independence, predominantly using brick and typically featuring relatively small floor areas. More than 10.7% of apartments are available for exchange. The median age of these properties is more than twice the corresponding figure for the entire dataset, indicating that older units are overrepresented among exchange listings. The dataset further contains 983 apartments scheduled for completion between 2026 and 2028. The maximum number of floors observed is 42, corresponding to the residential complex "Grand Alatau" in Astana. The median building height across the dataset is four floors.

Apartments are classified by construction type as follows: monolithic buildings account for 35.4%, panel buildings for 24.9%, brick buildings for 37.5%, and other types for 2.2%. The age distribution differs substantially by construction type. Monolithic buildings are relatively new: half of them are less than five years old, reflecting the active wave of monolithic construction that has intensified particularly over the past 20 years following independence. In contrast, panel buildings are predominantly a legacy of the Soviet period. Their median age is 44 years, indicating that most panel housing stock was developed before 1991. Brick buildings are represented by two main groups: Soviet-era properties and those constructed over the past two decades. The median age of brick buildings is 15 years, and 63.1% of them were built after independence, with a noticeable increase in brick construction also observed during the last 20 years.

3.2. Methodology

Model 1: Nationwide Model

For this study, the Ordinary Least Squares (OLS) model was chosen, as it allows for the estimation of linear relationships between the price per square meter and multiple quantitative and categorical real estate characteristics, such as area, floor level, building type, year of construction, and location. OLS provides interpretable coefficients that indicate the magnitude of the effect of each variable on price, which is essential for real estate market analysis. Moreover, the method is well suited for large samples, as in our case, and under the assumptions of homoskedasticity and independence of errors, it yields unbiased and efficient estimates. To account for potential heteroskedasticity, robust standard errors were employed, thereby increasing the reliability of the model's inferences.

Equation (1) and Table 1 present the variables included in the model. The functional form is specified as log-linear, following the approach used in Gandhi et al. (2014). The dependent variable is the logarithm of price per square meter. The set of independent variables includes various apartment characteristics. To assess differences in depreciation rates depending on building type, interaction terms between property age and building type were incorporated into the model. Additionally, dummy variables for cities of republican significance were included.

Equation 1. Nationwide Model.

$$\ln(price\_per\_meter) = B_0 + B_1 * area + B_2 * former\_dorm + B_3 * exchange\_possible + B_4 * age + B_5 * under\_construction + B_6 * brick + B_7 * monolith + B_8 * ceiling\_height + B_9 * first\_floor + B_{10} * top\_floor + B_{11} * type\_other + B_{12} * age\_brick + B_{13} * age\_monolith + B_{14} * age\_type\_other + B_{15} * Almaty + B_{16} * Astana + B_{17} * Shymkent$$

Table 1. Description of Variables Included in the Model.

Variable Name	Description
ln_price_per_meter	Log-transformed price per square meter
area	Apartment area (square meters)
former_dorm	Dummy variable: 0 – the apartment is not a former dormitory 1 – the apartment is a former dormitory
exchange_possible	Dummy variable: 0 – the apartment cannot be exchanged 1 – the apartment can be exchanged
age	Age of the apartment
under_construction	Building to be constructed in 2026–2028
brick	Dummy variable: 0 – the building is constructed using prefabricated concrete panels 1 – the building is constructed of brick
monolith	Dummy variable: 0 – the building is constructed using prefabricated concrete panels 1 – the building is constructed using cast-in-place reinforced concrete
ceiling_height	Ceiling height of the apartment
first_floor	Dummy variable: 0 – the apartment is not on the first floor 1 – the apartment is on the first floor
top_floor	Dummy variable: 0 – the apartment is not on the top floor 1 – the apartment is on the top floor
type_other	Dummy variable: 0 – the building is constructed using prefabricated concrete panels 1 – the building is constructed using another method
age_brick	Interaction between apartment age and brick building
age_monolith	Interaction between apartment age and cast-in-place reinforced concrete building
age_other	Interaction between apartment age and “other” building type
Almaty	Dummy variable: 0 – the apartment is not located in Almaty 1 – the apartment is located in Almaty
Astana	Dummy variable: 0 – the apartment is not located in Astana 1 – the apartment is located in Astana
Shymkent	Dummy variable: 0 – the apartment is not located in Shymkent 1 – the apartment is located in Shymkent

Tests for heteroskedasticity were conducted for all three models using the White and Breusch–Pagan procedures. The results indicate the presence of heteroskedasticity. To obtain consistent standard error estimates and ensure valid statistical inference, robust standard errors (HC1) were applied, thereby improving the reliability of coefficient significance tests. Some degree of multicollinearity is observed in the models, primarily due to the inclusion of interaction terms between variables.

Model 2: Astana

Model 2 was estimated exclusively for the city of Astana. The initial sample included 29,727 apartments located in Astana. After cleaning the data with respect to ceiling height, building age, and apartment size, 29,392 observations remained. Equation (2) and Table 2 present the variables included in the model. The variables *Almaty* and *Shymkent* were excluded, as the model was constructed solely for Astana. Several new dummy variables were introduced: *park*, *mega_silkway*, *asia_park*, *keruen*, *keruen_city*, *saryarqa*, *left_bank*, and *river*. The variable *left_bank* indicates whether the apartment is located on the left bank of Astana. The variable *river* captures whether the property is located within a 1 km radius of the embankment, while *park* indicates proximity within a 1 km radius to parks. The Appendix lists the names of the parks and the coordinates of the embankment line. All other newly introduced variables indicate whether the apartment is located within a 1 km radius of the respective shopping and entertainment center. The coordinates of parks, shopping centers, and the embankment were obtained using Google Maps. Distances for these variables were calculated based on the coordinates of the apartment and the corresponding park, shopping center, or embankment. The following shopping centers were included in the analysis: Mega Silkway, Asia Park, Keruen, Khan Shatyr, Saryarqa, and Keruen City. In the model specification, Khan Shatyr was chosen as the reference shopping center; therefore, the coefficients of the other shopping centers are interpreted relative to it. For the *park* variable, parks located on both the left and right banks of Astana were selected.

Equation 2. Astana Model.

$$\ln(price\_per\_meter) = B_0 + B_1 * area + B_2 * former\_dorm + B_3 * exchange\_possible + B_4 * age + B_5 * under\_construction + B_6 * brick + B_7 * monolith + B_8 * ceiling\_height + B_9 * first\_floor + B_{10} * top\_floor + B_{11} * type\_other + B_{12} * age\_brick + B_{13} * age\_monolith + B_{14} * age\_type\_other + B_{15} * park + B_{16} * mega\_silkway + B_{17} * asia\_park + B_{18} * keruen + B_{19} * keruen\_city + B_{20} * saryarqa + B_{21} * left\_bank + B_{22} * river$$

Table 2. Description of Variables Included in the Model.

Variable Name	Description
park	Dummy variable: 0 – the apartment is located within a 1 km radius of a park 1 – the apartment is located more than 1 km from a park
mega_silkway	Dummy variable: 0 – the apartment is located more than 1 km from Mega Silk Way 1 – the apartment is located within a 1 km radius of Mega Silk Way
asia_park	Dummy variable: 0 – the apartment is located more than 1 km from Asia Park 1 – the apartment is located within a 1 km radius of Asia Park
Keruen	Dummy variable: 0 – the apartment is located more than 1 km from Keruen 1 – the apartment is located within a 1 km radius of Keruen
Keruen_city	Dummy variable: 0 – the apartment is located more than 1 km from Keruen City 1 – the apartment is located within a 1 km radius of Keruen City
Saryarqa	Dummy variable: 0 – the apartment is located more than 1 km from Saryarqa 1 – the apartment is located within a 1 km radius of Saryarqa
left_bank	Dummy variable: 0 – the apartment is located on the right bank of Astana 1 – the apartment is located on the left bank of Astana
river	Dummy variable: 0 – the apartment is located more than 1 km from the embankment 1 – the apartment is located within a 1 km radius of the embankment

Model 3: Almaty

Model 3 was estimated exclusively for the city of Almaty. Initially, data were collected for 30,295 apartments in Almaty. After cleaning the dataset with respect to ceiling height, building age, and apartment size, 29,727 observations remained. Equation (3) and Table 3 present the variables included in the model. The variables *Astana* and *Shymkent* were excluded from this specification.

The following variables were created: *Auezov*, *Almaly, Nauryzbai, Alatau, Medeu, Turksib, Zhetysu, Al-Farabi*, and *metro*. The variable *metro* indicates whether the apartment is located within a 2 km radius of a metro station. To construct this variable, the coordinates of all operating metro stations in the city were used.
The variable *Al-Farabi* indicates whether the apartment is located above or below Al-Farabi Avenue in Almaty. The coordinates of Al-Farabi Avenue are provided in the Appendix. The remaining variables represent the administrative district in which the property is located. In the model, Bostandyk district was chosen as the reference category; therefore, the coefficients for all other districts are interpreted relative to it.

Equation 3. Almaty.

$$\ln(price\_per\_meter) = B_0 + B_1 * area + B_2 * former\_dorm + B_3 * exchange\_possible + B_4 * age + B_5 * under\_construction + B_6 * brick + B_7 * monolith + B_8 * ceiling\_height + B_9 * first\_floor + B_{10} * top\_floor + B_{11} * type\_other + B_{12} * age\_brick + B_{13} * age\_monolith + B_{14} * age\_type\_other + B_{15} * Auezov + B_{16} * Almaly + B_{17} * Nauryzbai + B_{18} * Alatau + B_{19} * Medeu + B_{20} * Turksib + B_{21} * Zhetysu + B_{23} * Al - Farabi + B_{24} * metro$$

Table 3. Description of Variables Included in the Model.

Variable Name	Description
Auezov	Dummy variable: 0 – the apartment is not located in Auezov District 1 – the apartment is located in Auezov District
Almaly	Dummy variable: 0 – the apartment is not located in Almalinsky District 1 – the apartment is located in Almalinsky District
Nauryzbai	Dummy variable: 0 – the apartment is not located in Nauryzbay District 1 – the apartment is located in Nauryzbay District
Alatau	Dummy variable: 0 – the apartment is not located in Alatau District 1 – the apartment is located in Alatau District
Medeu	Dummy variable: 0 – the apartment is not located in Medeu District 1 – the apartment is located in Medeu District
Turksib	Dummy variable: 0 – the apartment is not located in Turksib District 1 – the apartment is located in Turksib District
Zhetysu	Dummy variable: 0 – the apartment is not located in Zhetysu District 1 – the apartment is located in Zhetysu District
Al–Farabi	Dummy variable: 0 – the apartment is located below Al-Farabi Avenue 1 – the apartment is located above Al-Farabi Avenue
metro	Dummy variable: 0 – the apartment is located within 2 km of a metro station 1 – the apartment is located more than 2 km from a metro station

4. Results

The results of Model 1 are presented in Table 4. The estimated regression model explains 58.7% of the variation in the logarithm of price per square meter. Most of the independent variables are statistically significant at the 1% level, as evidenced by large t-values. The variable *type_other* is not statistically significant at the 10% level. The variable *age_brick* is not significant at the 5% level but reaches significance at the 10% level.

Although apartment size is statistically significant, its economic effect is relatively small: an increase of 1 square meter in size raises the price per square meter by only 0.08%. This is because the dependent variable in the model is price per square meter rather than the total apartment value. If total price were used as the dependent variable, the effect of size would be more pronounced, as total price is directly proportional to apartment area. Thus, ceteris paribus, the difference in price per square meter between a 40 m² and a 50 m² apartment is approximately 0.8%.

Apartments that were formerly dormitories are priced, on average, 14.7% lower per square meter than non-dormitory apartments. The possibility of an exchange reduces the price by approximately 4.2%. An increase of 1 meter in ceiling height raises the price per square meter by 19.4%.

Model 1: Nationwide

Table 4. Results of Model 1 - Nationwide

Variable Name	Coefficient	Standard Error	T (t-statistic)	p-value
const	12.2958	0.0153	804.6525	0.0000
area	0.0008	0.0000	24.0348	0.0000
former_dorm	–0.1474	0.0078	–20.5550	0.0000
exchange_possible	–0.0418	0.0027	–15.7437	0.0000
age	–0.0029	0.0001	–23.5298	0.0000
under_construction	–0.1235	0.0108	–12.1820	0.0000
brick	0.0248	0.0057	4.3167	0.0000
monolith	0.0993	0.0057	16.5371	0.0000
ceiling_height	0.1940	0.0053	33.6421	0.0000
first_floor	–0.0693	0.0027	–26.5690	0.0000
top_floor	–0.1130	0.0022	–54.7762	0.0000
type_other	0.0101	0.0100	1.0049	0.3149
age_brick	–0.0002	0.0001	–1.7403	0.0818
age_monolith	–0.0058	0.0002	–26.7136	0.0000
age_other	–0.0037	0.0003	–14.0755	0.0000
Almaty	0.9920	0.0023	305.7698	0.0000
Astana	0.3989	0.0020	168.0501	0.0000
Shymkent	0.2830	0.0031	80.6779	0.0000

Source: author's calculations.

The type of building construction affects apartment prices. Compared to panel buildings, brick apartments are 2.5% more expensive, monolithic apartments are 9.9% more expensive, and apartments in buildings of other types are 1% more expensive. Floor level also has the expected effect on price per square meter: compared to middle floors, apartments on the first floor are 6.9% cheaper, while those on the top floors are 11.3% cheaper.

Analysis of the interaction between building age and type shows that the rates of residential property depreciation vary significantly across construction types. The obtained coefficients indicate that panel buildings show the lowest sensitivity to age: a one-year increase in age reduces the price per square meter of panel apartments by approximately 0.29%. For brick buildings, the negative age effect is similar in magnitude (about 0.31%), whereas monolithic buildings demonstrate the highest rate of depreciation-around 0.87% for each additional year.

Differences in age-related depreciation rates are mainly associated with the life cycle stages of different building types. Panel buildings, having a large accumulated age, have already passed the main stages of physical wear and tear, so an additional year barely affects their condition, which explains the minimal age effect. Brick buildings exhibit moderate aging: their structural durability and mixed age composition lead to a small but consistent decrease in value with age. Monolithic buildings are predominantly new, and during the early stages of their service life, changes in physical characteristics occur more rapidly-hence the highest rate of age-related depreciation.

The price per square meter for apartments under construction (to be completed in 2026–2028) is on average 12.4% lower than for completed properties. Square meter prices also vary significantly by region. In Almaty, prices are almost twice as high as in settlements not classified as cities of republican significance (by 99.2%). In other cities of republican significance, the gap is less pronounced: in Astana, the price per square meter is 39.9% higher, and in Shymkent, it is 28.3% higher compared to other settlements.

Model 2: Astana

The results of Model 2 are presented in Table 5. The estimated regression model explains 47% of the variation in the logarithm of the price per square meter in Astana, and most coefficients are significant at the 1% level, as confirmed by the high values of the t-statistics. The variables brick, keruen_within_1000m, and type_other are not statistically significant at the 10% level.

Table 5. Results of Model 2 – Astana.

Variable Name	Coefficient	Standard Error	T (t-statistic)	p-value
const	11.8713	0.0302	392.5830	0.0000
area	0.0002	0.0001	3.0648	0.0022
former_dorm	–0.1296	0.0369	–3.7591	0.0002
exchange_possible	–0.0199	0.0056	–3.5818	0.0003
age	–0.0023	0.0003	–8.5430	0.0000
under_construction	–0.1569	0.0169	–10.1181	0.0000
brick	–0.0008	0.0112	–0.0736	0.9413
monolith	0.1180	0.0113	9.8564	0.0000
type_other	–0.0095	0.0175	–0.5442	0.5863
ceiling_height	0.5917	0.0103	44.9414	0.0000
first_floor	–0.0484	0.0062	–7.9720	0.0000
top_floor	–0.0619	0.0041	–15.5172	0.0000
age_brick	–0.0014	0.0003	–4.3452	0.0000
age_monolith	–0.0119	0.0005	–24.5874	0.0000
age_other	–0.0028	0.0009	–3.2475	0.0012
park	–0.1051	0.0028	–39.6073	0.0000
mega_silkway	0.0753	0.0100	7.2646	0.0000
asia_park	0.1001	0.0070	13.6038	0.0000
keruen	–0.0051	0.0086	–0.5920	0.5539
keruen_city	0.0561	0.0208	2.6205	0.0088
saryarka	0.1953	0.0113	15.7535	0.0000
left_bank	0.1127	0.0029	36.8206	0.0000
river	0.1040	0.0058	17.0407	0.0000

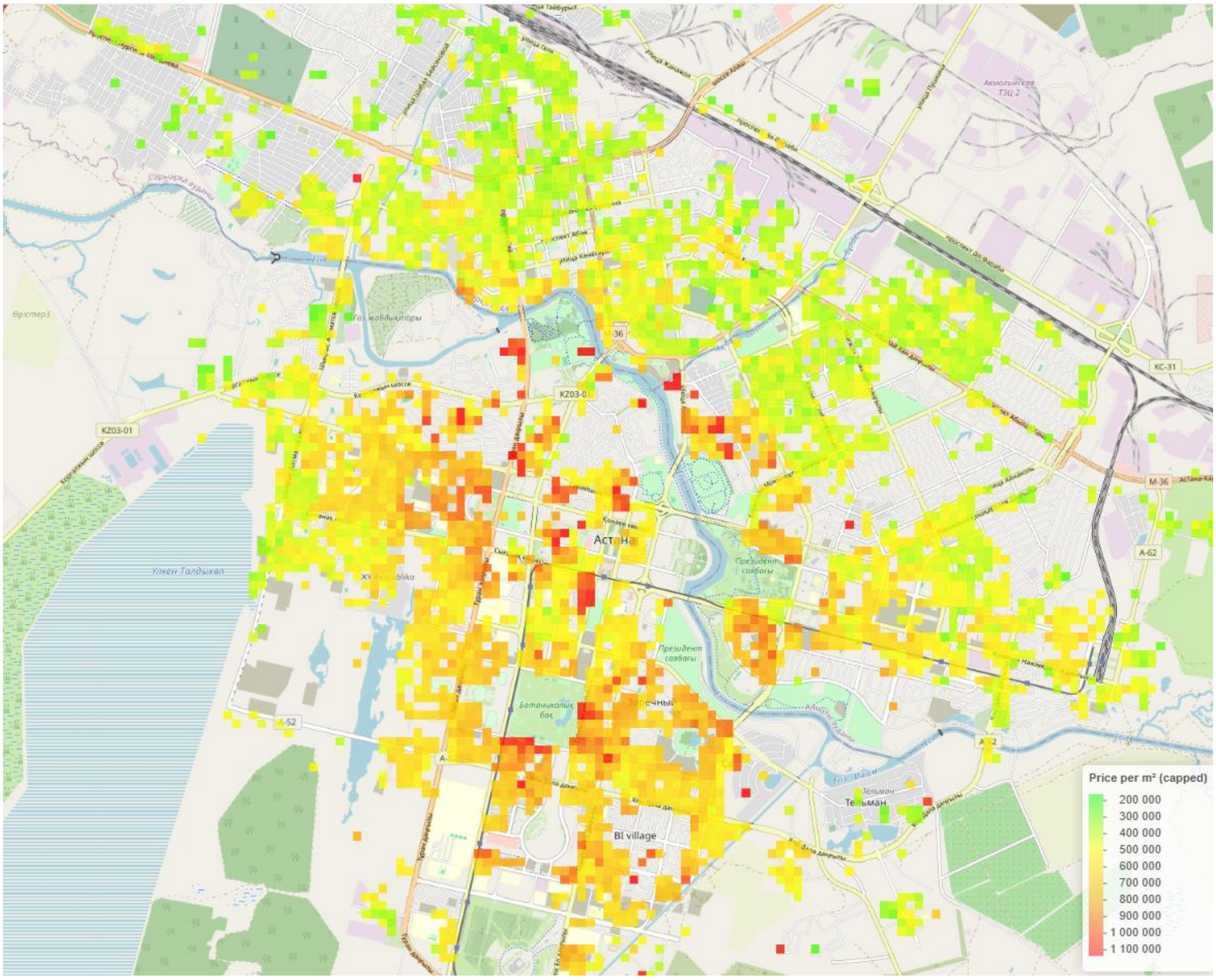
Source: author's calculations.

Similar to the Republican model, the apartment's area has a modest effect on the price per square meter. The price per square meter in monolithic buildings is 11.8% higher compared to panel buildings. Apartments previously used as dormitories have an average price per square meter about 13% lower than other properties. The possibility of an exchange reduces the price per square meter by approximately 2%.

As in the Republican model, the analysis of the interaction between building age and type shows that panel housing experiences the lowest rate of depreciation. A one-year increase in the age of a panel building reduces the price per square meter by approximately 0.23%. For brick buildings, the negative age effect is 0.38%, while monolithic buildings show the highest rate of depreciation-around 1.43% per additional year. These differences are explained by the age distribution of apartments across building types, as in the Republican model.

The price per square meter for apartments under construction (to be completed in 2026–2028) is on average 15.7% lower. An increase in ceiling height by 1 meter raises the price per square meter by 59.2%. Graph 1 shows the price per square meter of apartments in Astana. Properties priced around 200,000 tenge are marked in green, while those over 1 million tenge are marked in red. A clear pattern emerges: apartments located near parks generally have higher prices compared to those farther from green areas. The most pronounced effects are observed in the areas of the Botanical Garden, Sfera Park, Presidential Park, Linear Park, and Lovers' Park. The model results confirm this conclusion: the price per square meter of housing located more than 1 km from parks is on average 10.5% lower. On the right bank of Astana, this relationship is less pronounced. A possible explanation is that the left bank is significantly less green, so having a park nearby is a more valuable advantage. On the right bank, where greenery is more abundant, proximity to parks does not have such a strong effect on property prices.

Graph 1. Astana



Source: Krisha.kz, author's calculations.

Overall, the graph shows that prices per square meter on the right bank of Astana are on average lower than on the left bank. According to the model results, the price per square meter on the left bank exceeds that on the right bank by an average of 11.3%. Proximity to the riverfront is also a significant factor. Housing located closer to the river is characterized by higher prices: apartments within a 1 km radius of the riverfront have an average price per square meter 10.4% higher compared to properties located farther away.

The graph also demonstrates that the price per square meter of apartments located in close proximity to shopping centers is higher than for those farther away. This trend is most pronounced in the areas of the shopping centers “Khan Shatyr”, “Mega Silk Way”, and “Saryarqa”.

In the model, “Khan Shatyr” was chosen as the baseline shopping and entertainment center. Compared to it, the price per square meter of apartments within a 1 km radius is higher by 19.5% near “Saryarqa”, 10% near “Asia Park”, 7.5% near “Mega Silk Way”, and 5.6% near “Keruen City”. At the same time, the price per square meter near “Keruen” is on average 0.5% lower. However, this variable is not statistically significant at the 10% level.

Model 3: Almaty

The results of Model 3 are presented in Table 6. The estimated regression model explains 45.3% of the variation in the logarithm of the price per square meter in Almaty, and most coefficients are significant at the 1% level, as confirmed by the high values of the t-statistics. The variables age_brick, age_other, area, and type_other are not statistically significant at the 10% level. The variable monolith is not statistically significant at the 1% level but is significant at the 5% level.

Table 6. Results of Model 3 – Almaty.

Variable Name	Coefficient	Standard Error	T (t-statistic)	p-value
Const	12.9542	0.0347	373.7789	0.0000
area	0.0001	0.0001	0.8027	0.4222
former_dorm	–0.0275	0.0104	–2.6952	0.0070
exchange_possible	–0.0161	0.0052	–3.1128	0.0019
age	–0.0017	0.0003	–6.1571	0.0000
under_construction	–0.1164	0.0290	–4.2758	0.0000
brick	0.0466	0.0166	2.7409	0.0061
monolith	0.0316	0.0125	2.4897	0.0128
type_other	–0.0183	0.0273	–0.6762	0.4989
ceiling_height	0.3175	0.0111	24.8413	0.0000
first_floor	–0.0250	0.0048	–5.2977	0.0000
top_floor	–0.0482	0.0038	–13.1172	0.0000
metro	–0.0616	0.0034	–18.5561	0.0000
age_monolith	–0.0029	0.0004	–7.5856	0.0000
age_brick	0.0006	0.0004	1.5024	0.1330
age_other	0.0007	0.0007	1.1213	0.2622
auezov	–0.1929	0.0037	–57.4838	0.0000
almaly	–0.1000	0.0043	–24.4163	0.0000
nauryzbai	–0.3066	0.0058	–63.4447	0.0000
alatau	–0.3246	0.0049	–80.8174	0.0000
medeu	–0.0295	0.0059	–5.1004	0.0000
turksib	–0.3383	0.0061	–67.6919	0.0000
zhetysu	–0.2796	0.0066	–49.9375	0.0000
al–farabi	0.2063	0.0101	18.5591	0.0000

Source: author's calculations.

The price per square meter of apartments previously used as dormitories is on average 2.8% lower compared to other properties. In Astana, the former dormitory effect is particularly pronounced: if an apartment is located in a former dormitory, the reduction in price per square meter is significantly greater than the corresponding decrease in Almaty. The possibility of an exchange reduces the price per square meter by an average of 1.6%.

The price per square meter in brick buildings is on average 4.7% higher than in panel buildings, and in monolithic buildings it is 3.2% higher compared to panel buildings. This pattern differs from Astana, where the price per square meter in monolithic buildings was significantly higher than in Almaty. An increase in ceiling height by 1 meter raises the price per square meter by 31.2%.

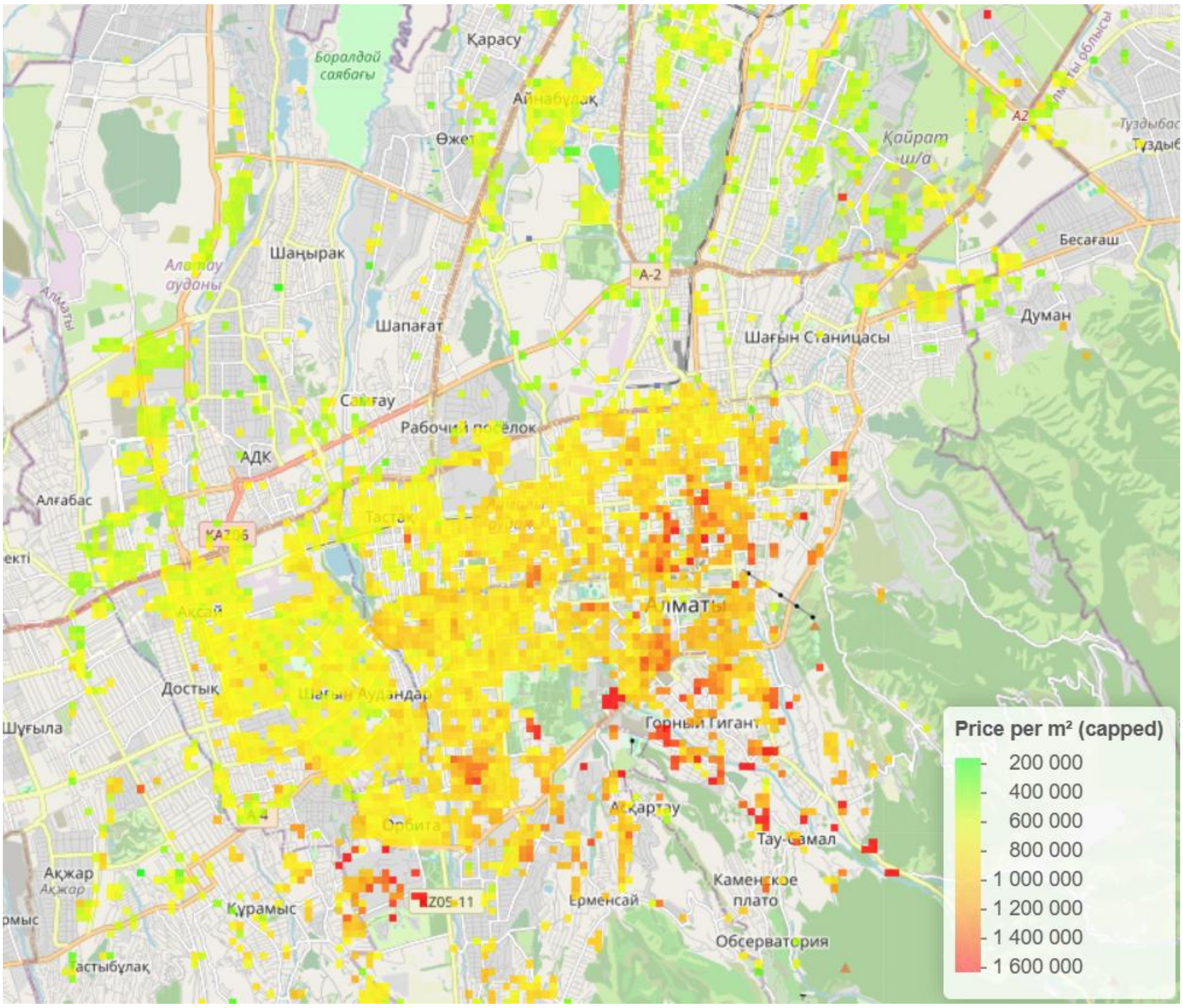
Since the variables age_brick and age_other are statistically insignificant, their coefficients cannot be considered reliable, and therefore no valid conclusions can be drawn about their effect on the price per square meter. In practice, this reflects a characteristic of the Almaty real estate market: apartment prices in the city remain generally high regardless of the building's age.

The analysis of the interaction between building age and type shows that panel buildings demonstrate the lowest sensitivity to aging: a one-year increase in their age reduces the price per square meter by approximately 0.17%, which is lower than in Astana (0.29%). This is due to market characteristics: Astana has a larger share of new buildings, whereas in Almaty a significant portion of the housing stock consists of panel buildings, so the impact of age on their price is less noticeable. At the same time, monolithic buildings exhibit the highest rate of depreciation-around 0.46% per additional year. The price per square meter of apartments under construction (to be completed in 2026–2028) is on average 11.6% lower than for completed properties.

Gpaph 2 shows the price per square meter of apartments in Almaty. Properties priced around 200,000 tenge are marked in green, while those over 1.6 million tenge are marked in red. Overall, a clear pattern is observed in Almaty: the closer an apartment is to the mountainous part of the city, the higher the price per square meter. There are significant price differences between Almaty's administrative districts, which is clearly visible both on the map and in the model results.

Bostandyk District, one of the most expensive in the city, was chosen as the baseline district. Compared to it, the price per square meter in Turksib District is 33.8% lower, in Alatau District 32.5% lower, in Nauryzbay District 30.7% lower, in Zhetysu District 28.0% lower, in Auezov District 19.3% lower, in Almaly District 10.0% lower, and in Medeu District 3.0% lower. Thus, the largest price differences are observed in Turksib and Alatau districts, whereas Medeu District is almost at the same level as the baseline Bostandyk District, reflecting a similar price range.

Graph 2. Almaty



Source: Krisha.kz, author's calculations.

The graph also shows a trend that apartments located above Al-Farabi Avenue, in the direction of the mountains, are significantly more expensive than properties situated below the avenue. The model results confirm this finding: the price per square meter of apartments located above Al-Farabi Avenue is on average 20.6% higher compared to apartments below the avenue. Furthermore, the price per square meter of apartments located more than 2 km from a metro station is on average 6.2% lower than that of properties within a 2 km radius of a station.

5. Conclusion

As part of the study, three models were constructed to assess the determinants of the residential real estate market in Kazakhstan.

In the nationwide model, significant determinants of the price per square meter include whether the city is classified as a city of republican significance, ceiling height, the apartment's status as a former dormitory, and the building's expected completion date. For example, in Almaty, excluding Astana and Shymkent, the price per square meter is almost twice as high as in other settlements. An increase in ceiling height by 1 meter raises the price per square meter by 19.4%, whereas the status of an apartment as a former dormitory reduces it by 14.7%. In addition, if the building is expected to be completed in 2026–2028, the price per square meter will be 12.4% lower.

The results of the model for the city of Astana show that the price per square meter is determined by a number of locational factors, including whether the apartment is on the left or right bank of the Ishim River, proximity to parks and shopping and entertainment centers, as well as distance from the riverfront. For instance, being located on the left bank increases the price per square meter by 11.3%, and proximity to parks raises it by 10.5%. Among shopping centers, proximity to Saryarqa has the greatest impact on the price. Significant property characteristics include ceiling height, monolithic building type, former dormitory status, and planned completion in 2026–2028.

In the model for Almaty, the key locational determinants are the district where the apartment is located, its position relative to Al-Farabi Avenue (above or below), and the distance to the nearest metro station. Among Almaty's districts, the highest price per square meter is observed in Bostandyk District, while in Turksib District it is lower than in other districts. Apartments located above Al-Farabi Avenue have a price per square meter 20.6% higher. The presence of a metro station within a 2 km radius increases the price per square meter by 6.2%. Significant property characteristics include ceiling height and planned completion in 2026–2028.

Limitations of the study include the use of cross-sectional data, which does not allow for the analysis of housing price dynamics over time or the identification of long-term effects. The analysis does not account for a number of important factors that can influence housing prices, including the quality of interior finishes, the technical condition of the building, noise levels, views from windows, and access to social infrastructure such as schools, kindergartens, hospitals, and other medical facilities. Institutional and regulatory aspects, such as urban planning restrictions and government housing programs, are also not considered, which may limit the generalizability of the results.

In the future, it is advisable to conduct additional research to analyze price changes over time. Of particular interest is assessing the impact of the launch of the LRT in Astana on housing prices: comparing how apartment prices change before and after the line becomes operational, and determining whether proximity to the LRT leads to an increase in property values. The development of transport infrastructure increases mobility within the city and generally has a positive effect on housing prices. By analogy with Almaty, proximity to the metro typically leads to higher prices. A similar effect can be expected from the LRT. However, it is important to consider potential negative factors: if the LRT generates high levels of noise and discomfort, it could reduce the attractiveness of nearby housing and have a downward effect on its price.

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Appendix

List of parks included in the Variable "Park"

Botanical Garden
Presidential Park
Central Park
Ghashyktar Park
Zheruyik Park
Defenders of the Fatherland Square
Linear Park
Ataturk Park
Bauyrzhan Momyshuly Park
Zhetisu Park
EXPO Park
Journalists Park
Student Park
Rescuers Park
Afghan War Park
Central Mosque Park
Koktal Park
Triathlon Park
Sphere Park
Railway Workers Park
Bucharest Park
Pushkin Park
Botanical Garden

List of Coordinates of the Embankment Line

№	Latitude	Longitude
1	51.15688	71.40781
2	51.15907	71.41606
3	51.15845	71.42406
4	51.15274	71.42717
5	51.14969	71.43447
6	51.14605	71.44084
7	51.14088	71.44158
8	51.13583	71.44495
9	51.13125	71.44683
10	51.12608	71.45263
11	51.12256	71.44795
12	51.11997	71.44589
13	51.11727	71.44814
14	51.11492	71.45076
15	51.11198	71.4502
16	51.10916	71.45094
17	51.10716	71.45413
18	51.10587	71.45937
19	51.10563	71.46536
20	51.10516	71.47229
21	51.10269	71.47547

List of Coordinates of Al-Farabi Avenue

№	Latitude	Longitude		30	43.20716	76.91378
1	43.19137	76.88852		31	43.20946	76.91602
2	43.18853	76.88953		32	43.21125	76.91858
3	43.18611	76.88953		33	43.21274	76.92143
4	43.18338	76.88938		34	43.2143	76.92378
5	43.18032	76.88996		35	43.21449	76.92349
6	43.17696	76.89025		36	43.21607	76.9258
7	43.17411	76.89039		37	43.21801	76.92934
8	43.17138	76.8914		38	43.21991	76.93201
9	43.16874	76.8914		39	43.22049	76.93273
10	43.1659	76.89169		40	43.22891	76.96465
11	43.16369	76.89212		41	43.22645	76.96659
12	43.15979	76.894		42	43.22281	76.96802
13	43.15716	76.89429		43	43.22065	76.96792
14	43.15137	76.8966		44	43.21842	76.96904
15	43.148	76.89848		45	43.21648	76.97057
16	43.14654	76.89925		46	43.21381	76.97078
17	43.14326	76.90083		47	43.21224	76.97169
18	43.14114	76.90216		48	43.21016	76.97241
19	43.13812	76.9035		49	43.2086	76.97323
20	43.13547	76.90277		50	43.20689	76.97414
21	43.13263	76.90471		51	43.2057	76.97629
22	43.19482	76.88822		52	43.20466	76.97894
23	43.19481	76.88967		53	43.20242	76.97986
24	43.19543	76.89611		54	43.19989	76.98139
25	43.19818	76.89999		55	43.19818	76.98302
26	43.20004	76.90327		56	43.19632	76.98425
27	43.20121	76.90765		57	43.19468	76.98619
28	43.20247	76.91174		58	43.19357	76.99007
29	43.20426	76.91368		59	43.18991	76.99757