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## HEDONIC PRICING, RENTAL YIELD AND HOUSING AFFORDABILITY: THE CZECH MICRO-APARTMENT MARKET AND ITS LESSONS FOR CENTRAL AND EASTERN EUROPE

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**ABSTRACT.** Micro-apartments, the smallest self-contained dwellings, have expanded rapidly as a response to the housing affordability crisis, yet they remain almost unstudied in the Central European context. This paper analyses the micro-apartment segment (16-23 m<sup>2</sup>) in the Czech Republic and compares it with two larger categories of small apartments, using listing-level data from January 2018 to June 2026. It combines descriptive analysis with hedonic regression, quantile regression, an Oaxaca-Blinder decomposition, and a survival analysis of time on market. Micro-apartments are simultaneously the cheapest apartments in absolute terms and the most expensive per square metre; this unit-price premium of about 22 percent is genuine and structural rather than a product of location or composition, and it strengthens in the upper price bands. The premium is economically rational, underpinned by the highest gross rental yield of all categories, which makes the segment both an affordable outlet for budget-constrained buyers and an investment product for small landlords. Micro-apartment prices are also the most sensitive to mortgage rates, whereas the smallest units sell at least as quickly as larger ones, so the premium does not reflect impaired liquidity.

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## Introduction

Housing affordability has become one of the most pressing socioeconomic problems in the Czech Republic and the wider Central European region. Between 2018 and 2022 apartment prices rose far faster than wages, and the subsequent increase in mortgage rates further restricted access to owner-occupied housing, leaving a growing share of households priced out of the market (Kalabiska & Hlavacek, 2022; Slavata, 2023). Dynamic affordability modelling in a transition-economy context similarly shows that elevated price-to-income ratios leave households struggling simultaneously with down-payment and monthly-repayment constraints, confirming that affordability measurement must capture both price levels and financing conditions rather than income ratios alone (Mukayev et al., 2022). Comparable strains are visible across European cities, where affordability has deteriorated unevenly between and within urban areas (Le Goix et al., 2021). In this environment, the smallest self-contained dwellings, here termed micro-apartments, have expanded as a distinct market response, offering an entry point to ownership and a compact rental product where conventional apartments have become unaffordable (Urban Land Institute, 2014; Wang et al., 2025).

Micro-apartments present an apparent paradox that motivates this study. On the one hand, they are the cheapest apartments in absolute terms, which makes them accessible to budget-constrained buyers such as first-time owners and single-person households. On the other hand, anecdotal market evidence and international research suggest that they are the most expensive category per square metre. It is not obvious whether this unit-price premium is a genuine effect of small size or merely an artefact of where and how micro-apartments are built, whether the segment functions primarily as an affordability outlet or as an investment vehicle, and whether its high unit price is compensated by any disadvantage such as poorer sellability. These questions have so far received little systematic attention in the Czech and Central European context, where research has concentrated on aggregate affordability, regional price determinants, and the credit channel rather than on the smallest size class as a market in its own right. Linking minimum wages to a local rent-price index has been proposed as a policy mechanism to keep housing attainable at roughly 30% of labour income, underscoring that rent levels and wage-setting interact in shaping effective affordability for lower-income households (Lough, 2024).

The purpose of this paper is to provide a systematic quantitative analysis of the micro-apartment segment (16-23 m<sup>2</sup>) in the Czech Republic and to compare it with two larger categories of small apartments (24-35 m<sup>2</sup> and 36-50 m<sup>2</sup>). Five research questions are addressed. First, how do the prices of micro-apartments, both per square metre and in absolute terms, compare with the larger categories and evolve over time? Second, is the higher unit price of micro-apartments a genuine size effect once differences in location, construction, and condition are controlled for? Third, what is the economic explanation for the premium and, in particular what role is played by rental yield and investment demand? Fourth, how sensitive is the segment to changes in mortgage rates relative to larger apartments? Fifth, does the unit price premium reflect a liquidity discount, that is, do micro-apartments take longer to sell?

To answer these questions, the study draws on a large body of listing-level data on the Czech residential market covering the period from January 2018 to June 2026, and combines

descriptive analysis of prices, rents, yields, supply shares and regional composition with hedonic regression, quantile regression, an Oaxaca-Blinder decomposition and a survival analysis of time on market. The contribution is twofold. Empirically, the paper offers what is, to the authors' knowledge, the first dedicated quantitative treatment of micro-apartments as a separate segment in the Central European context. Substantively, it shows that the unit-price premium of micro-apartments is real and structural rather than compositional, and that it is economically rational, being underpinned by a systematically higher rental yield, which reframes micro-apartments simultaneously as an affordability outlet and as an investment product. The remainder of the paper is organised as follows. Section 1 reviews the relevant literature, Section 2 describes the data and methods, Section 3 presents the results across the price, supply, yield, sensitivity, hedonic, decomposition and liquidity analyses, and the final section concludes with a discussion of limitations and implications.

## 1. Literature review

Housing affordability in the Czech Republic and the wider Central European region has deteriorated markedly in the past decade. Regional analyses document large and persistent differences in affordability across the country (Slavata, 2023) and in the determinants of housing prices between regions (Kalabiska & Hlavacek, 2022), while comparative work places the Czech market alongside its Slovak counterpart in a common deterioration of access to housing (Poliaková & Kameníková, 2023). Comparable pressures are reported throughout Europe, where affordability differs sharply between and within cities (Le Goix et al., 2021; Klasić & Svirčić Gotovac, 2024), where supply constraints amplify price growth (Hilber & Vermeulen, 2016; Engerstam, 2021), and where the COVID-19 shock reshaped demand in several countries (Głuszak & Belniak, 2021; Hebdzyński, 2024). Analysis of multifamily residential land in Polish cities shows that plot quality and location fundamentals systematically shape residential-market outcomes, confirming that land and location constraints transmit directly into housing prices and the structure of new supply (Rącka, 2023).

A second strand of the literature examines the drivers of these dynamics. The cost and availability of mortgage credit are central. Czech studies analyse the calibration of borrower-based macroprudential measures (Hejlová et al., 2021), the application of DSTI and DTI limits to the mortgage market (Venhoda, 2022) and the interaction between real-estate prices and monetary policy through the consumer price index (Táborský, 2024). On the supply side, the role of construction activity in transmitting demand into prices and rents has been examined for the V4 countries and Austria (Kadeřábková & Řežábek, 2023), while the length of the permitting process has been shown to raise development costs and prices and local opposition to residential development further constrains new supply (Lukavec et al., 2024).

Subsidy policy can also feed into prices rather than affordability (Krolage, 2023), and real estate is increasingly treated as an investment asset competing with financial markets (Krulický & Horák, 2019; Trojanek et al., 2023). Segmentation analyses of housing demand reveal that buyer clusters differ fundamentally in the weight they attach to price, with some segments treating dwellings primarily as consumption goods and others as investment assets, which anticipates the dual demand structure documented here for micro-apartments (Głuszak, 2011). The investment motive also shapes how new residential supply is financed and acquired: off-plan sales, in which units are purchased before completion, act simultaneously as a financing channel for developers and as an investment for buyers, who secure a lower entry price and capture price appreciation over the construction period (Katwa & Obala, 2023; Yoon et al., 2024).

The pricing of apartments by their attributes is conventionally analysed with hedonic regression (Trojanek, Tanaś, & Trojanek, 2019). For the Czech market, Lukavec and Kadeřábková (2017) estimate the implicit price of location by relating Prague apartment prices to distance from the city centre, and automated valuation approaches have been developed on Czech data (Endel et al., 2020); a wide international literature applies the same approach to apartment markets from Kosovo (Hoxha et al., 2022) to Vietnam (Nguyen et al., 2020) and Kenya (Kieti & Ogolla, 2021). Applications of the hedonic method to Warsaw dwelling prices further demonstrate that locational disamenities are capitalised into prices with measurable percentage discounts, reinforcing the importance of controlling location rigorously when isolating pure attribute effects such as the size premium (Trojanek, 2014).

A recurring finding is that floor area enters non-linearly: the price per unit of area declines as size increases, so that smaller dwellings are systematically more expensive per square metre, a pattern often described as a size or quantity premium. Local Czech evidence confirms this pattern on the municipal scale: in the town of Sedlčany the price per square metre falls as unit area rises, newly completed apartments command a marked premium over the older stock, and advertised asking prices sit consistently above the transaction prices recorded in the cadastre (Holcman & Škoda, 2022). This unit-price premium for smaller units is precisely the mechanism that makes the smallest apartments economically distinctive, yet it is rarely isolated as an object of study in its own right.

Micro-apartments, the smallest self-contained dwellings on the market, have attracted growing attention internationally as a response to high urban housing costs. Industry research describes them as a durable housing type for high-cost markets, whose occupants trade space for affordability and central location, and notes that they command a higher rent per unit of floor area than conventional apartments (Urban Land Institute, 2014).

Wang et al. (2025) provides one of the first systematic, data-driven analyses of US urban micro-housing, identifying several distinct project typologies and their locational patterns. The international evidence converges on two points: micro-units are driven jointly by the affordability crisis and by investor demand, and they carry a unit-price premium relative to larger dwellings.

Despite this attention, the micro-apartment segment remains almost unstudied in the Central European and Czech context, where the existing literature focusses on aggregate affordability, regional price determinants, and the credit channel rather than on the smallest size class as a distinct market. The present study addresses this gap by treating micro-apartments (16-23 m<sup>2</sup>) as a separate segment and comparing them with two larger categories of small apartments across price, rent, yield, regional distribution, and liquidity. Combining descriptive trends with hedonic, quantile and decomposition methods on a large body of listing-level data, it tests whether the unit-price premium of micro-apartments is real and structural, and characterises their role in the Czech housing-affordability crisis.

## **2. Methodological approach**

This study draws on a single, internally consistent body of micro-data on residential real-estate advertising in the Czech Republic. This section describes the data source, the definition of the size categories, the cleaning of the data, and the statistical methods applied in Section 3.

## 2.1. Data source and EVAL software

The outputs are based on EVAL software, developed by one of the authors since 2007, which has previously been used to map the volume and regional structure of advertised supply on the Czech residential market (Hromada, 2021). The software continuously collects, analyses, and evaluates residential real-estate advertising published on the main Czech property servers, covering apartments offered for sale and for rent across all municipalities of the Czech Republic, with data collected at monthly intervals. Research on property-technology adoption among Baltic real-estate professionals shows that digital analytics increasingly mediate valuation and investment decisions, while professional readiness, legal ambiguity, and knowledge gaps condition how effectively such data-driven tools are integrated into market practice (Banaitiene et al., 2025). For each listing, it records a wide range of attributes, including city and street, apartment layout, asking price and price per square metre, listing identifier, building material and condition, type of ownership, position within the building and floor, usable and floor area, balcony, loggia, terrace, cellar, garage and parking, year of reconstruction, utilities, the energy-performance certificate and its indicator, accessibility, fittings and lift. Because every listing is archived offline and can be traced back across time by its identifier, the software detects duplicates, errors, and manipulative agency practices, such as the repeated withdrawal and re-listing of a property at a changed price, which are removed during cleaning. Auxiliary series are taken from public sources: the average rate on new mortgage loans from the Czech National Bank and the consumer price index from the Czech Statistical Office. The analysis covers the period from January 2018 to June 2026, with the listing level tracking used in the survival analysis beginning in November 2017. Unit values are summarised by medians rather than means, because the median is robust to extreme values and better captures the typical asking price; where series are aggregated to quarters, the quarterly value is the number-of-listings-weighted average of the monthly medians.

## 2.2. Definition of size categories and data cleaning

Throughout the study, apartments are grouped into three size categories by usable floor area, defined in Table 1: micro-apartments (16-23 m<sup>2</sup>), small apartments (24-35 m<sup>2</sup>) and standard small apartments (36-50 m<sup>2</sup>). The micro-apartment band corresponds to the smallest self-contained dwellings on the market, while the two larger bands serve as comparison groups of conventional small apartments. To avoid contamination of the rental figures, the rental data are cleaned of room rentals and shared housing, so that the rental supply and the rental yield refer to whole self-contained apartments only. For the hedonic and decomposition analyses, the extreme 1st and 99th percentiles of the price per square metre are removed before estimation.

Table 1. Definition of apartment size categories by usable floor area

| Size category             | Usable floor area    |
|---------------------------|----------------------|
| Micro-apartments          | 16–23 m <sup>2</sup> |
| Small apartments          | 24–35 m <sup>2</sup> |
| Standard small apartments | 36–50 m <sup>2</sup> |

Source: *own definition*

### 2.3. Statistical methods

The descriptive series (Sections 3.1 to 3.6) report medians of asking prices, rents, and derived ratios; long-term trends are extracted from the volatile monthly or quarterly series by locally weighted regression (LOWESS, smoothing parameter  $\text{frac} = 0.18$ ), with the raw series retained in the background. The gross rental yield is the annual rent per square metre (the monthly rent per  $\text{m}^2$  multiplied by 12) divided by the asking price per square meter. The sensitivity of price growth to interest rates (Section 3.6) is estimated by ordinary least squares (OLS) of the year-on-year growth of the median price per  $\text{m}^2$  on the average rate of new mortgage loans, separately for each size category; because year-on-year growth computed from overlapping windows is serially correlated, the significance is verified with autocorrelation-consistent standard errors.

The effect of size on the unit price is isolated by a log-linear hedonic regression (Section 3.7) of the logarithm of the price per square metre on the logarithm of usable area and a set of controls (building condition, panel construction, location classified as Prague, Brno, or other, and year), estimated on a random sample of 200,000 listings with heteroskedasticity-robust (HC3) standard errors; the coefficient on log area has the interpretation of an elasticity. Two further techniques probe the robustness and structure of this effect. Quantile regression (Koenker & Bassett, 1978; Section 3.8) re-estimates the same model at the 10th, 25th, 50th, 75th, and 90th percentiles of the conditional price distribution, with confidence intervals obtained by bootstrap. The Oaxaca-Blinder decomposition (Oaxaca, 1973; Blinder, 1973; Section 3.9) splits the price-per- $\text{m}^2$  gap between micro-apartments and standard small apartments into a component explained by differences in composition and an unexplained structural component, using pooled reference coefficients (Neumark, 1988; Oaxaca & Ransom, 1994) and bootstrap confidence intervals.

Finally, the liquidity analysis (Section 3.10) treats the disappearance of a listing from the offer as an event. Listings are tracked in monthly snapshots by their identifier, and time on market is the number of months between the first and last appearance. Listings still active in the last available month are right-censored, and listings already present in the very first month are excluded to avoid left-censoring. Survival is estimated by the Kaplan-Meier estimator, and the effect of size, net of location, by a Cox proportional-hazards model.

## 3. Results

### 3.1. Price per square metre across size categories and over time

Figures 1 and 2 trace the median asking price per  $\text{m}^2$  for the three size categories nationwide (Figure 1) and in Prague (Figure 2); the bold lines are the LOWESS trend and the faint lines the actual monthly medians. The central result is that the smallest apartments are not the cheapest per unit of area: for most of the period micro-apartments command the highest unit price of all three categories. Buyers pay a surcharge for an extremely small area because a residence with minimal floor space still carries full technical equipment (kitchenette, bathroom), the cost of which is spread over fewer square metres.

Nationwide the premium is present but not constant. In January 2018 a micro-apartment cost 49,972 Czech koruna (CZK) /  $\text{m}^2$  compared to 42,439 for a standard small apartment, about one fifth more, and during 2018-2020 it exceeded small apartments by approximately 7,300 CZK/ $\text{m}^2$ . The ordering then shifts: micro-apartments led until mid-2022, after which small apartments overtook them, so that over 2023-2026 micro-apartments were about 7,300 CZK/ $\text{m}^2$  cheaper than small apartments. At the end of the period (May 2026), the medians were 126,504,

136,765 and 118,530 CZK/m<sup>2</sup> for micro, small, and standard small apartments; standard small apartments remained the cheapest per m<sup>2</sup> throughout.

In Prague the premium is stronger and never closes: micro-apartments hold the highest unit price throughout the period, exceeding small apartments by about 18,900 CZK/m<sup>2</sup> in 2018-2020 and still 17,400 in 2023-2026, and reaching 243,731 CZK/m<sup>2</sup> by May 2026, more than double the 2018 level. In both markets, prices follow the general cycle, rising to a 2021-2022 peak, correcting in 2022-2023, and resuming growth from 2024. The stronger month-to-month fluctuation of micro-apartments reflects their small sample (about 156 listings per month nationwide and 58 in Prague, against thousands for the larger categories), not genuinely more volatile pricing, which is why a LOWESS trend is fitted to each series.

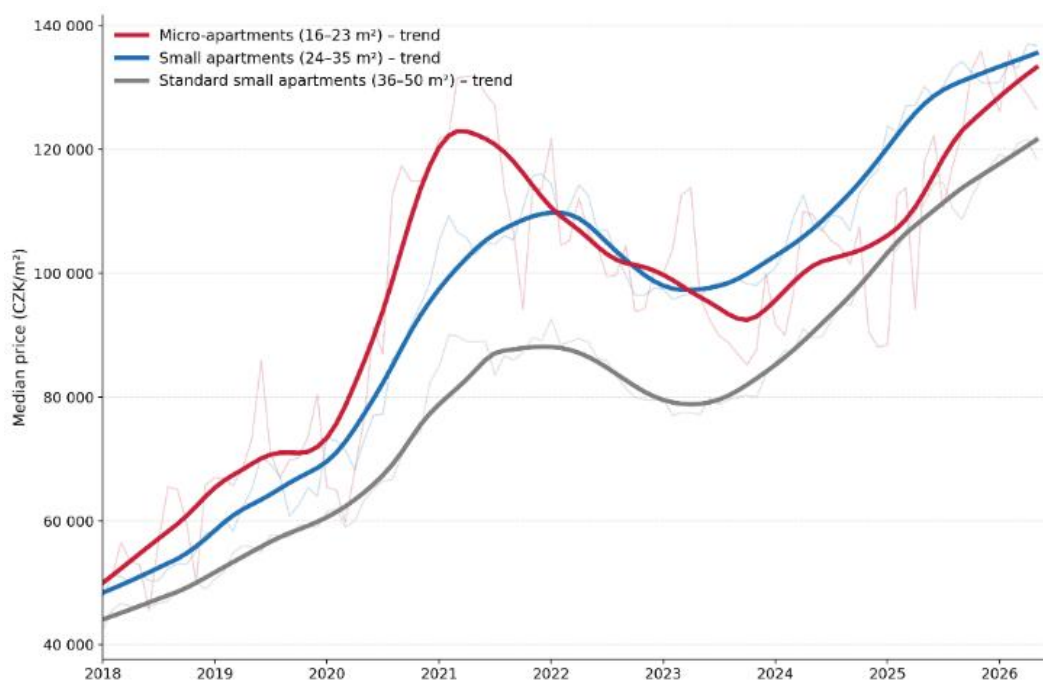


Figure 1. Median asking price per m<sup>2</sup> by apartment size category. Apartments for sale, Czech Republic, January 2018 - May 2026 (LOWESS trend in actual monthly series).

Source: *EVAL software, January 2018 - May 2026, asking prices, medians, Czech Republic.*

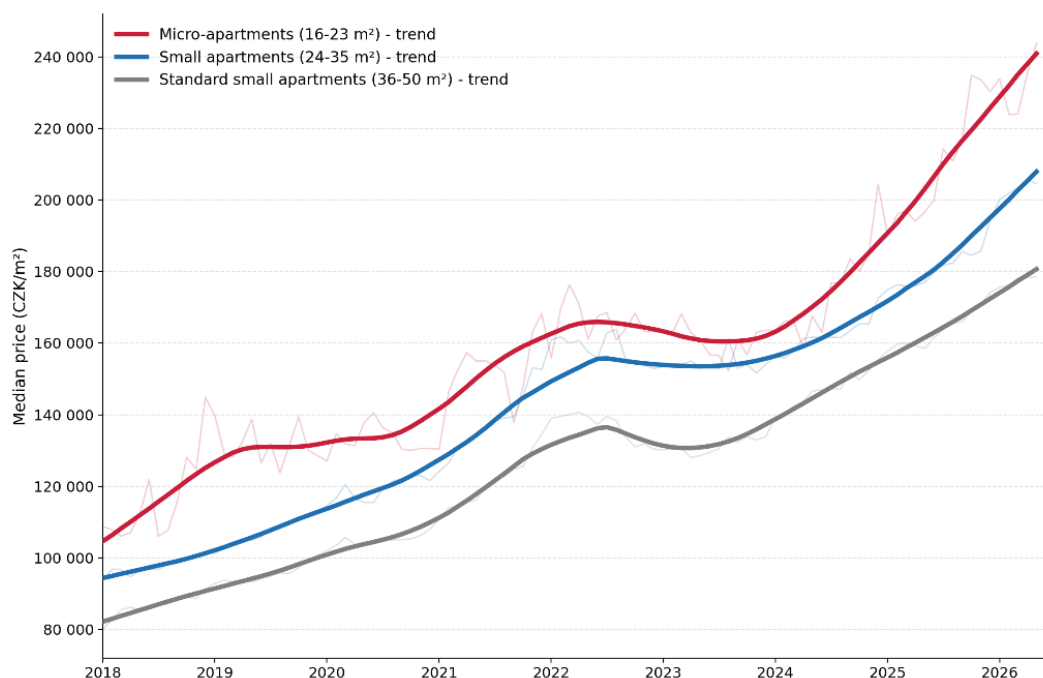


Figure 2. Median asking price per m<sup>2</sup> by apartment size category. Apartments for sale, Prague, January 2018 - May 2026 (LOWESS trend in actual monthly series).

Source: *EVAL software, January 2018 - May 2026, asking prices, medians, Prague.*

### 3.2. Total purchase price and absolute affordability

Figure 3 turns to the absolute purchase price, the other side of the paradox. The micro-apartment curve lies below the other two throughout and never crosses them. At the end of the period (2026) the median total price was about CZK 2.8 million for a micro-apartment, 4.1 million for a small apartment and 5.2 million for a standard small apartment, so a micro-apartment is roughly 1.3 million cheaper than a small apartment and 2.4 million cheaper than a standard one. The same ordering holds in Prague at a higher level, with medians of about CZK 4.8, 6.1 and 7.9 million, respectively.

This is the second pillar of micro-apartment demand. In addition to investors attracted by the higher rental yield (Section 3.5), micro-apartments appeal to budget-constrained buyers, in particular first-time buyers and single-person households, for whom the decisive figure is the total price and the associated mortgage, not the price per m<sup>2</sup>. Because larger apartments appreciate faster in absolute terms, the gap between categories widens over time, reinforcing the relative affordability of the smallest units.



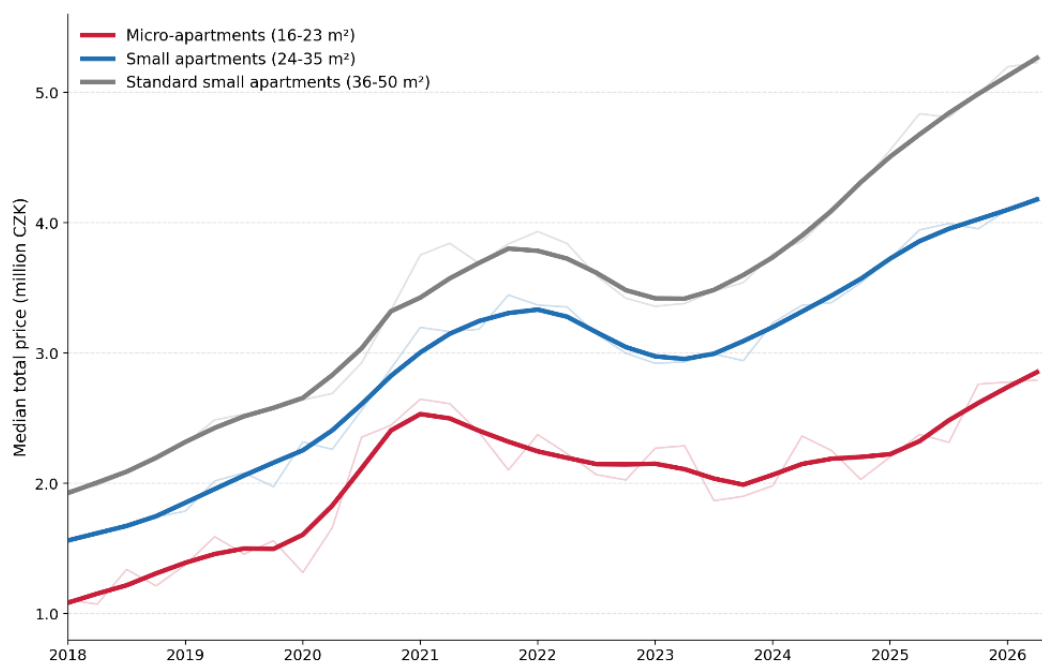


Figure 3. Median total purchase price by apartment size category. Apartments for sale, Czech Republic, quarterly, January 2018 - June 2026 (LOWESS trend in the actual quarterly series). Source: *EVAL software, January 2018 - June 2026, asking prices, medians of total price, Czech Republic.*

### 3.3. Share of micro-apartments in the sale and rental supply

Figure 4 compares the share of micro-apartments (16-23 m<sup>2</sup>) in total supply on the sale and rental markets. Micro-apartments make up a far higher share of the rental supply than of the sale supply, by roughly a factor of three: about 0.7 to 1.0 percent of apartments for sale against 1.8 to 3.0 percent of apartments for rent. This follows from their nature as an investment product bought for letting rather than owner-occupation, so they accumulate in the rental supply while remaining rarer on the sale market, a pattern consistent with their higher rental yield (Section 3.5).

Both shares rise over time. The rental share grew markedly during the 2020-2021 boom and then settled around 2.7 to 3.0 percent, while the sale share rises more gently and stays below one percent. The micro-apartment segment is therefore gaining ground, although it remains marginal overall.

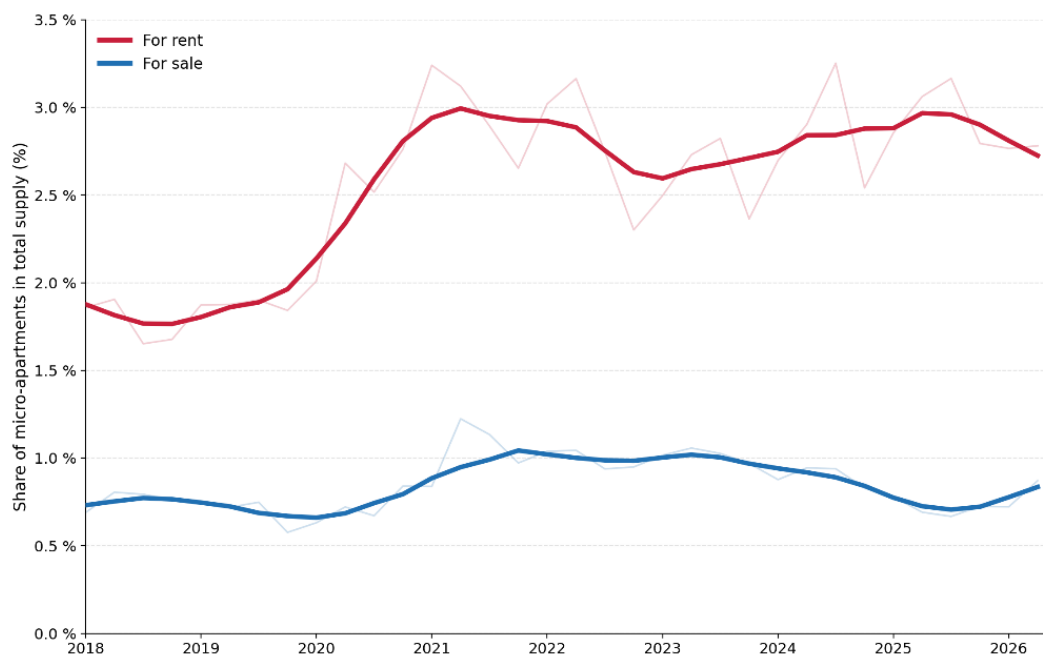


Figure 4. Share of micro-apartments (16-23 m<sup>2</sup>) in the total supply of apartments, for sale versus for rent. Czech Republic, quarterly, January 2018 - June 2026 (LOWESS trend over the actual quarterly series).

Source: EVAL software, January 2018 - June 2026, share of the number of listings, Czech Republic. Clean up of rental data from room rentals.

### 3.4. Regional composition of supply: Prague, Brno, and the rest

Figure 5 shows the regional composition of the micro-apartment supply on the sale market, each quarter summing to 100% across four groups: Prague, Brno, regional cities and other towns and municipalities. Micro-apartments are not a big-city phenomenon: other towns and municipalities account on average for around half of all micro-apartments, Prague for about a third, regional cities for about a sixth, and Brno for only a few percent.

The distribution also changes with time. The share of other towns and municipalities rose from about 40 percent in 2018 to roughly 53 percent in 2025-2026, while Prague fell from about 33 to 28 percent, regional cities from about 19 to 15 percent and Brno from about 7 to 4 percent. Micro-apartments thus spread from the metropolises into smaller settlements over the period.

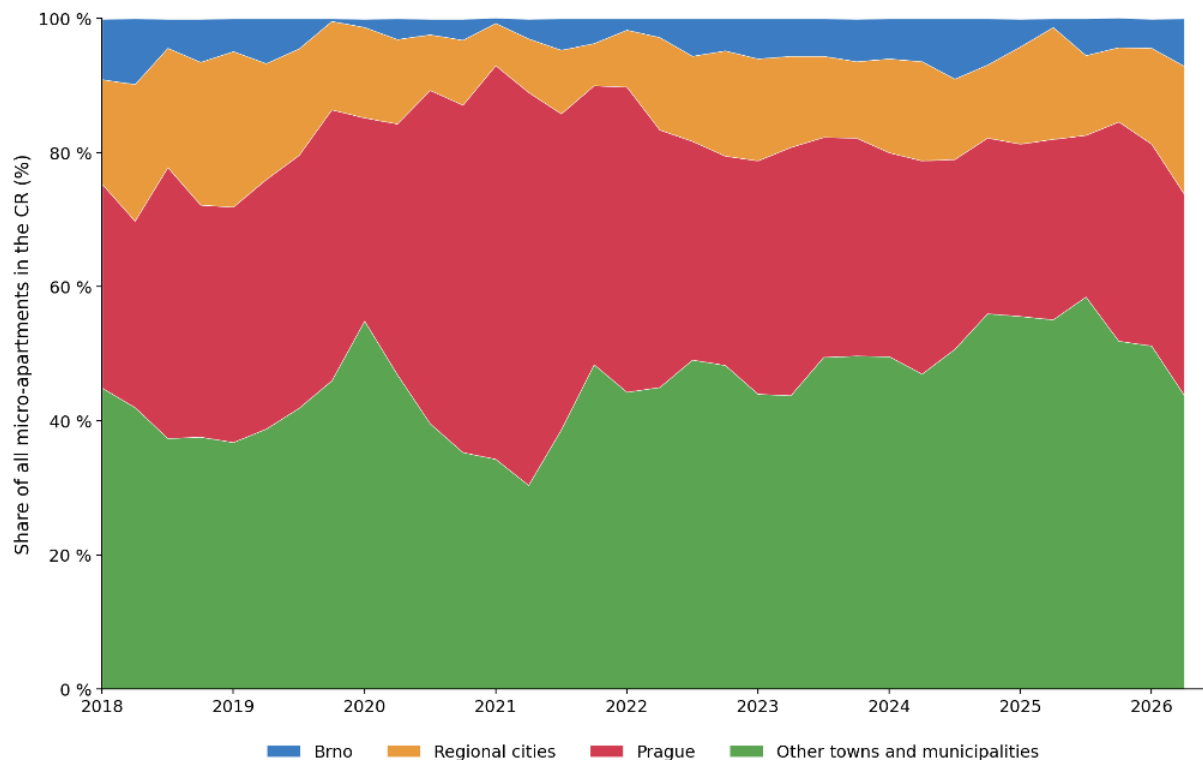


Figure 5. Regional distribution of micro-apartment (16-23 m<sup>2</sup>) supply. Apartments for sale, share of each region in the national total, Czech Republic, quarterly, January 2018 - June 2026. Source: EVAL software, January 2018 - June 2026, number of micro-apartment listings for sale, composition by region, Czech Republic.

### 3.5. Gross rental yield across size categories

Figure 6 shows the gross rental yield (annual rent per m<sup>2</sup> over price per m<sup>2</sup>) by size category for Prague, chosen because the capital is a price-homogeneous, high-liquidity market in which the series is smooth. Throughout the period, micro-apartments carry the highest gross yield, above small apartments and above standard small apartments, with the ordering stable and the curves not crossing for most of the period.

This explains the economic logic of the price premium: investors pay more per m<sup>2</sup> for micro-apartments because the rent per m<sup>2</sup> is higher still, so the yield is higher, and the premium is a rational reflection of return rather than an irrational surcharge. Prague yields are somewhat lower than the national figures because prices are higher while rents do not fully close the gap; they ran at 5 to 6 percent at the start, fell to about 3 percent during the 2020-2021 boom and recovered to around 3.6 percent for micro-apartments by the end of the period. The fact that the result is still valid even in Prague, the most expensive market, underlines its generality.

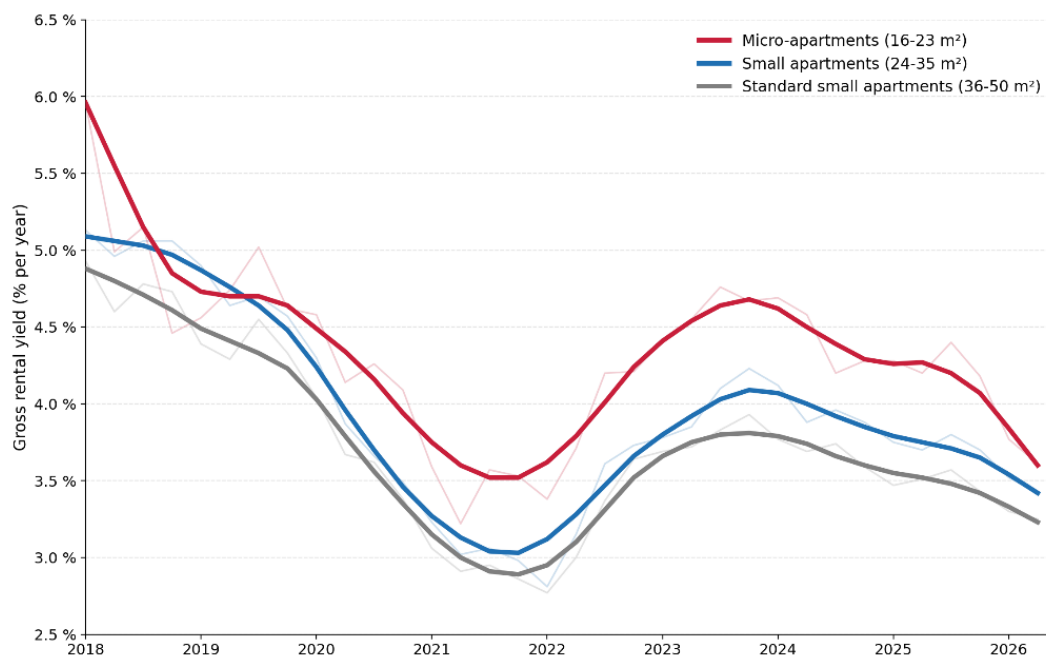


Figure 6. Gross rental yield by apartment size category. Prague, quarterly, January 2018 - June 2026 (LOWESS trend over the actual quarterly series).

Source: *EVAL software, January 2018 - June 2026, asking prices and rents, medians, Prague. Clean up of rental data from room rentals.*

### 3.6. Price-growth response to mortgage rates

Figure 7 plots, for each quarter, the year-on-year growth of the median price per m<sup>2</sup> against the average rate on new mortgage loans, with OLS lines fitted by category; a steeper slope means higher sensitivity. The relationship is negative and statistically significant for all categories, confirming interest rates as a key driver of the market.

The categories differ markedly. Micro-apartments have the steepest slope, about -12.8 percentage points of growth per one percent rise in the rate, against -9.7 for small apartments and -7.0 for standard small apartments, so they are almost twice as sensitive as the largest category. The micro-apartment line crosses the others: at low rates their prices grow fastest; at high rates they fall deepest. Contrary to the intuition that the smallest, most affordable units would be resilient, micro-apartments are the most cyclical, most credit-sensitive segment, consistent with their character as an investment product whose demand relies on credit financing. The conclusion is robust to autocorrelation-consistent (Newey-West) standard errors.

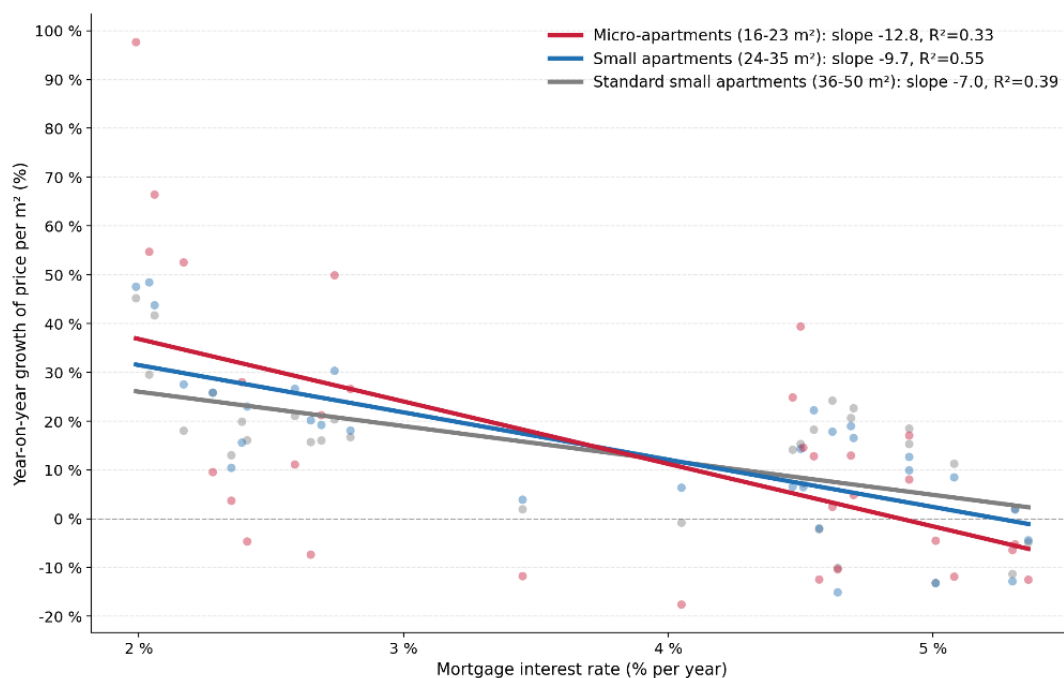


Figure 7. Sensitivity of price growth to mortgage rates by apartment size. Apartments for sale, Czech Republic, quarterly, 2018-2026. Points are quarters (year-on-year growth of the median price per  $\text{m}^2$ ); lines are OLS regressions. A steeper slope indicates a higher sensitivity to interest rates.

Source: *EVAL software (prices) and Czech National Bank (mortgage rate), 2018-2026, Czech Republic.*

### 3.7. Hedonic estimate of the pure size effect

Figure 8 and Table 2 isolate the effect of the size itself on the price per  $\text{m}^2$  from the factors correlated with size. The log-linear hedonic model explains the log price per  $\text{m}^2$  by log area and controls for condition, panel construction, location and year; on 200,000 listings it reaches  $R^2 = 0.68$ , with an area elasticity of  $-0.258$  (standard error 0.003,  $t$  about  $-90$ ), so a 10 percent larger area lowers the price per  $\text{m}^2$  by about 2.6 percent. The model curve decreases from about 140 thousand CZK/ $\text{m}^2$  for the smallest apartments to just under 80 thousand for apartments around 80  $\text{m}^2$ .

The size premium survives this control: at equal condition, construction, location and year, a 20  $\text{m}^2$  micro-apartment is about 22 percent more expensive per  $\text{m}^2$  than a 43  $\text{m}^2$  standard apartment, exceeding the raw category-level gap of about 18 percent (see Section 3.9). The premium is therefore a real effect of the small area, not an artefact of composition. The elasticity is sensitive to the inclusion of location, falling from  $-0.43$  to  $-0.26$  once location is added; this magnitude of change indicates that location is an important control and the fact that the coefficient converges to a plausible, precisely estimated value ( $-0.258$  in the full model, standard error 0.003) supports treating it as the reliable estimate of the pure size effect. The control variables behave plausibly (Table 2): panel construction lowers the price per  $\text{m}^2$  by about 21 percent, Prague is about 24 percent above Brno and other towns about 45 percent below it, a new building raises it by about 50 percent, and prices rise steadily year on year.

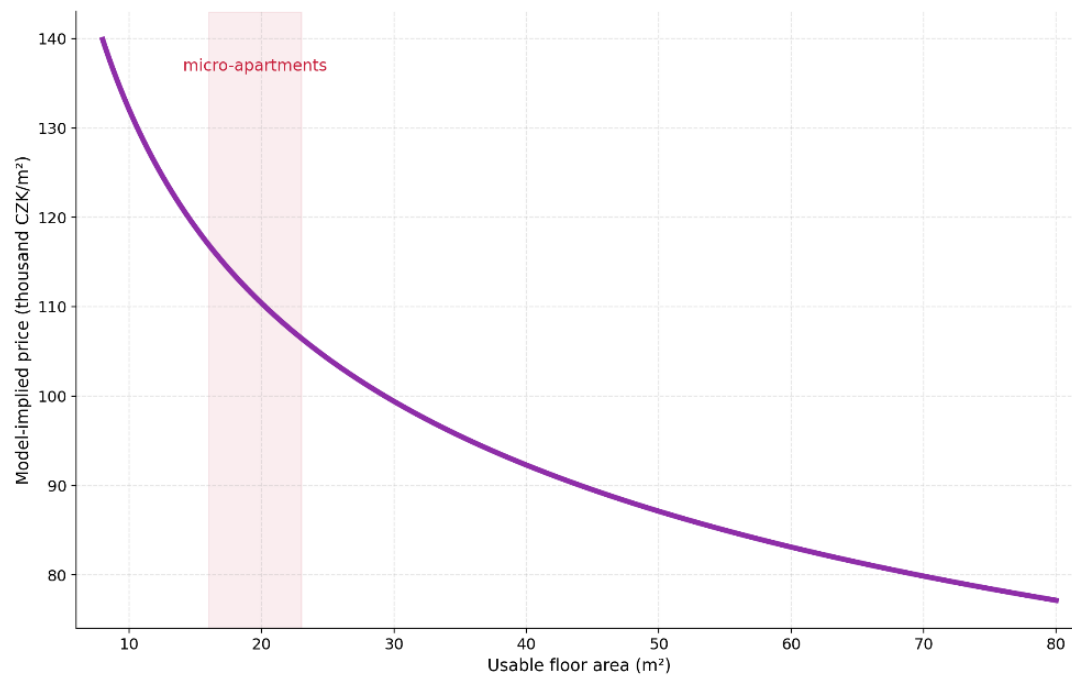


Figure 8. Hedonic model: the pure effect of floor area on the price per m<sup>2</sup> (controlling for condition, construction, location and year; reference apartment 2023). Czech Republic, 2017-2026.

Source: *EVAL software, individual listing data, for sale, Czech Republic, 2017-2026. Log-linear hedonic regression, area elasticity = -0.258, R<sup>2</sup> = 0.68, n = 200,000.*

Table 2. Hedonic regression of the logarithmic price per m<sup>2</sup> (OLS, n = 200,000, R<sup>2</sup> = 0.68)

| Variable                          | Coefficient | Std. error | t      | Effect   |
|-----------------------------------|-------------|------------|--------|----------|
| Constant                          | 11.813      | 0.014      | 868.8  | –        |
| ln(floor area) – elasticity       | -0.258      | 0.003      | -90.0  | –        |
| Panel construction                | -0.240      | 0.002      | -120.5 | -21.4 %  |
| Location: Prague (ref. Brno)      | 0.219       | 0.004      | 51.7   | +24.5 %  |
| Location: other towns (ref. Brno) | -0.603      | 0.004      | -148.2 | -45.3 %  |
| Condition: new building           | 0.410       | 0.003      | 129.5  | +50.6 %  |
| Condition: after reconstruction   | 0.217       | 0.003      | 69.9   | +24.2 %  |
| Condition: poor                   | -0.243      | 0.038      | -6.5   | -21.6 %  |
| Year 2018 (ref. 2017)             | 0.063       | 0.006      | 9.7    | +6.5 %   |
| Year 2023                         | 0.572       | 0.006      | 89.1   | +77.3 %  |
| Year 2026                         | 0.832       | 0.008      | 106.3  | +129.8 % |

Source: *EVAL software, individual listing data, for sale, Czech Republic, 2017-2026. Reference categories: Brno, non-panel construction, year 2017. Effect = exp(coefficient) - 1. Full set of condition and year dummies included in the model. t-statistics are computed from unrounded coefficients and standard errors.*

### 3.8. Effect of size on the conditional price distribution

Figure 9 extends the hedonic analysis from the conditional mean to the whole conditional distribution of prices. Whereas ordinary least squares estimate a single average

effect of area, quantile regression (Koenker & Bassett, 1978) estimates the elasticity of the price per square metre with respect to area separately for individual percentiles of the conditional price distribution. It thus answers whether the size premium is the same for cheap and expensive apartments or differs across the price spectrum. The points show the elasticity estimates for the 10th, 25th, 50th, 75th, and 90th percentiles, the shaded band is their 95 percent confidence interval obtained by bootstrap, and the dashed line marks the OLS reference estimate.

The results reveal pronounced and statistically significant heterogeneity. The elasticity is not constant but strengthens monotonically (becomes more negative) towards the higher price bands: from -0.204 at the tenth percentile it falls to -0.257 at the median and further to -0.305 at the ninetieth percentile. The confidence intervals of the extreme percentiles do not overlap, so the difference is significant. The OLS estimate re-estimated on the same subsample (-0.261) lies roughly in the middle of this range and, as is typical of an average estimate, conceals the heterogeneity entirely.

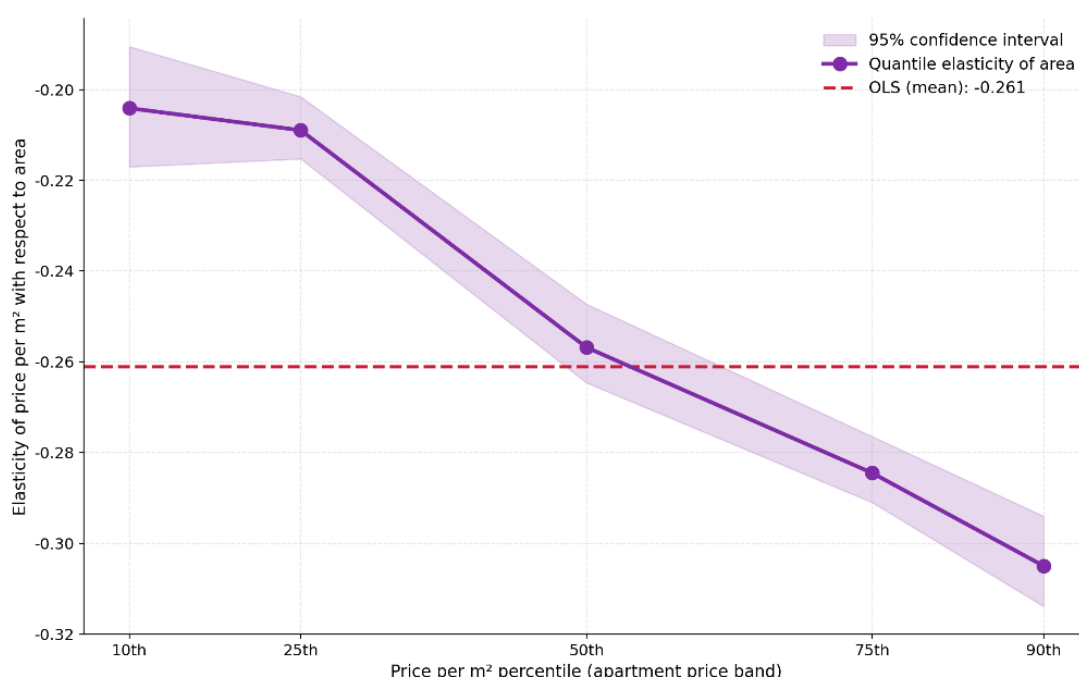


Figure 9. Quantile hedonic regression: elasticity of the price per m<sup>2</sup> with respect to area, by percentile of the price distribution. Apartments for sale, Czech Republic, 2017-2026.

Source: *EVAL software, individual listing data, for sale, Czech Republic, 2017-2026. Quantile regression (IRLS),  $n = 120,000$ , 95% CI bootstrap (120 replications).*

Translated into the micro-apartment premium, in the lower price band (10th percentile), a 20 m<sup>2</sup> micro-apartment is about 17 percent more expensive per square metre than a standard 43 m<sup>2</sup> apartment, whereas in the upper price band (90th percentile) this premium reaches just over 26 percent. Therefore, the premium for smallness is strongest in the most expensive market segment. This has an intelligible economic interpretation: In the upper part of the price distribution, where premium locations, high-quality new buildings and investment or pied-à-terre demand are concentrated, buyers are willing to pay a much higher surcharge for compactness than in the affordable segment, where a small area on its own does not command such a high premium per square metre. The premium for smallness is thus largely a phenomenon of the upper end of the market. It should be noted that the percentile here refers to the conditional price distribution, so a higher percentile denotes an apartment that is more

expensive than its area, condition, construction, and location would imply, rather than simply a more expensive apartment.

### ***3.9. Decomposition of the price gap into composition and structure***

Figure 10 decomposes the overall difference in the price per square metre between micro-apartments (16-23 m<sup>2</sup>) and standard small apartments (36-50 m<sup>2</sup>) using the Oaxaca-Blinder method (Oaxaca, 1973; Blinder, 1973). The method splits the gap into two parts: an explained component arising from the fact that the two groups differ in their composition (location, construction, building condition, year of sale), and an unexplained, or structural, component, which the differences in composition do not explain and which can be interpreted as the pure premium for smallness. The waterfall chart shows the contribution of each component expressed as a percentage of the total gap.

The total gap in the price per square metre averages about 18 percent in favour of micro-apartments over the whole period. However, the decomposition reveals that this raw gap actually understates the pure size premium. The unexplained component, the structural premium for smallness, reaches 121 percent of the total gap, which in price terms amounts to roughly 22 percent. The composition of micro-apartments as a whole works against them: if the price were governed only by their observed characteristics, micro-apartments would be cheaper than standard apartments.

The key to this finding lies in the construction and condition categories. Micro-apartments are more often of panel construction (contribution -11 percent) and more often in a worse or less representative condition (contribution -21 percent); both characteristics lower the price per square metre and would, on their own, make micro-apartments cheaper. Location acts slightly the other way (+7 percent), since micro-apartments are marginally more often in more expensive cities, and the year of sale contributes +4 percent. After summing all these compositional effects, the explained gap is negative, so the entire observed price advantage of micro-apartments, and more, is carried by the unexplained structural premium for the small area itself.

This result is especially valuable because it independently confirms the hedonic regression. The structural premium from the Oaxaca-Blinder decomposition (about 22 percent) practically coincides with the pure size premium estimated by the hedonic model (21.9 percent), even though the two values come from different methods. Two independent techniques thus reach the same conclusion: the price exceptionality of micro-apartments is a real and robust consequence of their small area, not an artefact of their location or qualitative composition. On the contrary, the compositional characteristics of micro-apartments should make them cheaper, so the pure premium for smallness is even stronger than the raw price difference suggests.



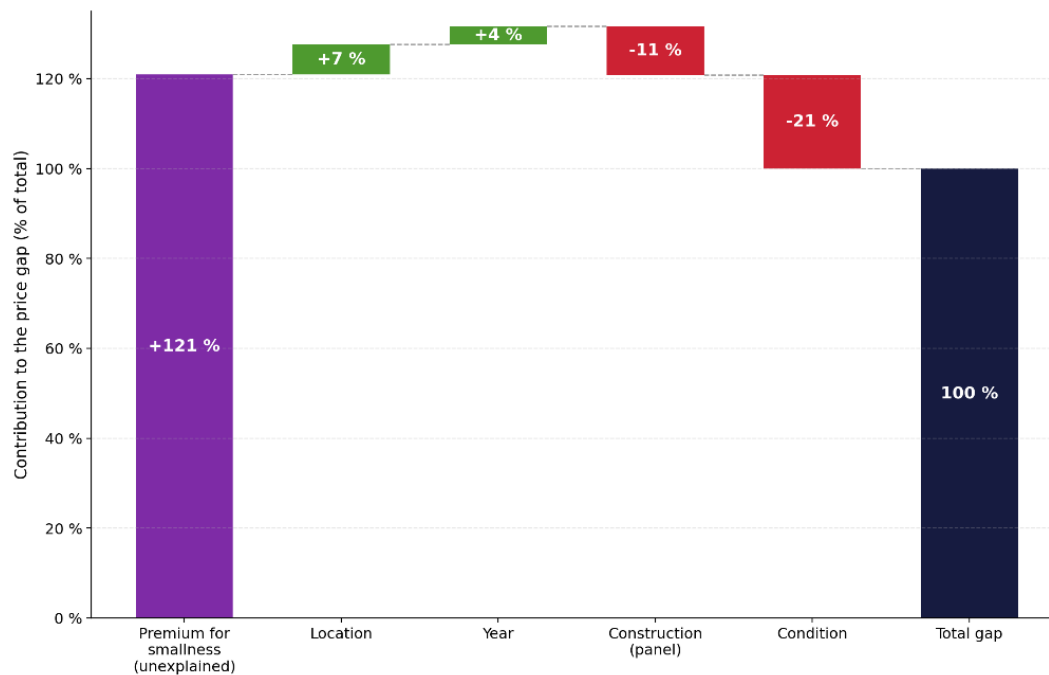


Figure 10. Oaxaca-Blinder decomposition of the price-per-m<sup>2</sup> gap between micro-apartments (16-23 m<sup>2</sup>) and standard small apartments (36-50 m<sup>2</sup>); total gap about +18 %. Contribution of each component as a share of the total gap. Czech Republic, 2017-2026.

Source: *Eval software, individual listing data, for sale, Czech Republic, 2017-2026. Twofold Oaxaca-Blinder (pooled reference, Neumark, 1988); 95% CI by bootstrap (200 replications). Green = composition raises the micro-apartment price, red = composition lowers it.*

### 3.10. Time on market and liquidity by size

Figure 11 introduces a dimension different from the preceding price analysis, namely liquidity, that is, how quickly apartments are sold out of the offer. It exploits the fact that the same listing can be tracked across the monthly snapshots of the database by its identifier: time on market is the number of months from the first to the last appearance of a listing, and its disappearance from the offer is interpreted as an event (a sale or withdrawal). The Kaplan-Meier curves show the share of listings still on the market after a given number of months, separately for micro-apartments, small apartments and standard small apartments.

The main finding is that the time on the market is short and remarkably similar between size categories. The median time on market is about two months for all three categories, and the Kaplan-Meier curves practically overlap. The market is fast: after the first month around 60 percent of listings remain in the offer, after the second month only about 40 percent, and within six months more than 90 percent of apartments have disappeared. Only a tiny fraction of listings (around three percent) remains active until the end of the observation window. The apartment size therefore does not in itself make a marked difference to the speed at which the offer clears.

The Cox proportional-hazards model nevertheless reveals a small but statistically significant difference in the direction expected for liquidity. After controlling for location, micro-apartments have about a 4.5 percent higher instantaneous hazard of disappearing from the offer than standard small apartments (hazard ratio 1.045; 95 percent confidence interval 1.015 to 1.077), and small apartments about 2 percent (hazard ratio 1.022; interval 1.009 to 1.035). Both confidence intervals lie above one, so the difference is significant, although economically modest. Micro-apartments disappear from the offer slightly faster, consistent with

the idea that their lower total price widens the pool of potential buyers and raises liquidity. Location, in contrast, does not significantly affect turnover speed.

This result has an important bearing on the interpretation of the micro-apartment price premium found in the earlier parts of the study. It might be objected that the high price per square metre of micro-apartments is compensation for impaired sellability, that is, a risk premium for lower liquidity. The survival analysis refutes this objection: micro-apartments do not disappear from the offer more slowly than larger apartments, but equally fast, if not marginally faster. The price premium for smallness is therefore not compensation for worse liquidity, but a genuine premium that buyers are willing to pay for a small area without accepting any disadvantage in the speed of sale. Two limitations should be borne in mind: the disappearance of a listing need not always mean a sale, as it may also reflect the withdrawal of an unsuccessful offer or its re-listing under a new identifier, so what is measured is time to disappearance from the offer as a proxy for liquidity; and the time resolution is monthly, so differences of the order of weeks cannot be captured.

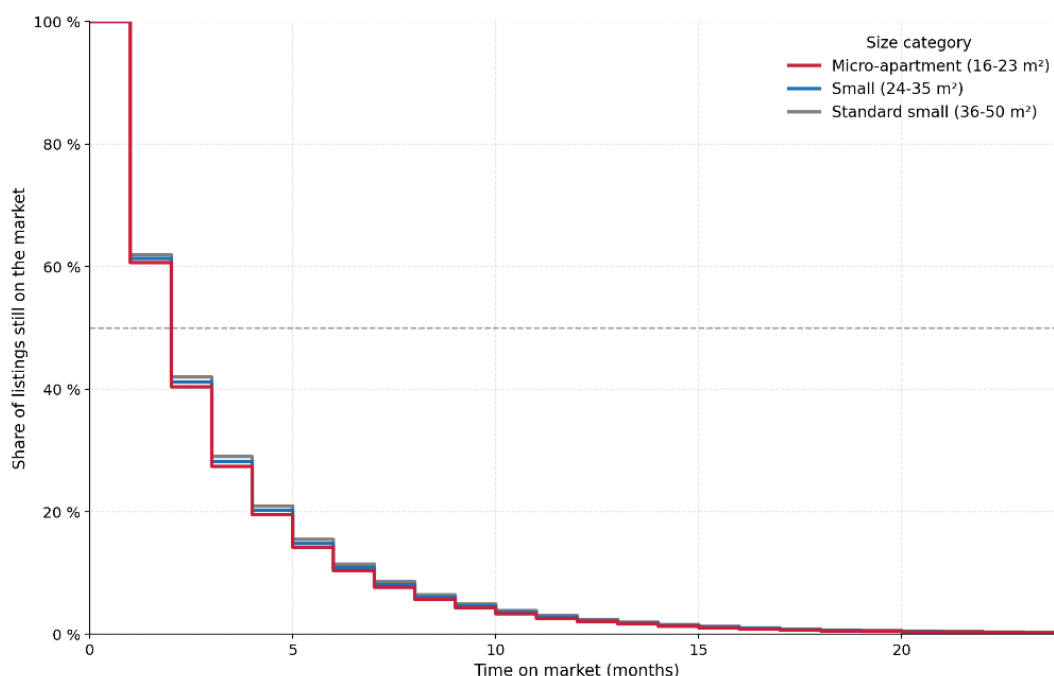


Figure 11. Market time by apartment size (Kaplan-Meier). Apartments for sale, Czech Republic, share of listings still on the market after a given number of months, November 2017 - May 2026.

Source: EVAL software, listing tracking across monthly snapshots, for sale, Czech Republic, November 2017 - May 2026. Event = disappearance from the offer (proxy for sale or withdrawal); listings active in the last month are right-censored.

## Conclusion

This paper has provided a systematic quantitative analysis of the micro-apartment segment (16-23 m<sup>2</sup>) in the Czech Republic and compared it with two larger categories of small apartments. Drawing on a large body of listing-level data for the period from January 2018 to June 2026, it combined descriptive analysis of prices, rents, yields and supply with hedonic regression, quantile regression, an Oaxaca-Blinder decomposition, and a survival analysis of

time on market. The results give a consistent answer to the research questions set out at the beginning and resolve the apparent paradox surrounding the smallest dwellings.

The central finding is that micro-apartments are simultaneously the cheapest apartments in absolute terms and the most expensive per square metre, and that this unit-price premium is genuine rather than a statistical artefact. The hedonic model isolates an elasticity of the price per square metre with respect to floor area of about -0.258, implying that an otherwise identical micro-apartment is roughly 22 percent more expensive per square meter than a standard small apartment. The Oaxaca-Blinder decomposition confirms this result by an independent route, attributing essentially the entire price gap to an unexplained structural premium for smallness; indeed, the observed composition of micro-apartments, more often of panel construction and in poorer condition, would on its own make them cheaper, so the pure premium is even larger than the raw gap suggests. The quantile regression further shows that the premium is not uniform but strengthens towards the upper price bands.

The premium is economically rational, rather than anomalous. Micro-apartments deliver the highest gross rental yield of all three categories throughout the period, which explains why investors are willing to pay more per square metre for them, and they accordingly account for a markedly higher share of the rental supply than of the sale supply. The segment is therefore best understood as serving two roles at once: an affordability outlet for budget-constrained owner-occupiers, for whom the low absolute price is decisive, and an investment product for small landlords attracted by the yield. Two further results refine this picture. Micro-apartment prices are the most sensitive of all categories to changes in mortgage rates, which marks the segment as the most cyclical and credit-dependent part of the market, consistent with its investment character. At the same time, the survival analysis shows that micro-apartments sell at least as quickly as larger apartments, so the unit-price premium is not compensation for impaired liquidity, but a price that buyers pay willingly. Geographically, micro-apartments are far from being a metropolitan phenomenon alone and have been spreading from the largest cities into smaller towns over the period.

These findings should be read with several limitations in mind. The analysis rests on asking prices rather than transaction prices, which may differ from final-sale prices, and on advertising data whose composition can shift over time. The micro-apartment sample, although large in absolute terms, is a marginal share of the market, so the monthly series for the smallest category are noisier than for larger apartments, which is why trends are smoothed throughout. Survival analysis treats the disappearance of a listing as a proxy for sale, although it may also reflect withdrawal, and its resolution is monthly. The sensitivity estimates are based on year-on-year growth from overlapping windows, whose significance was therefore verified with autocorrelation-consistent standard errors. Finally, the study is confined to the Czech market and to the period under observation.

However, the results have implications for housing policy and urban development. Micro-apartments demonstrably widen access to owner-occupied housing in an environment of severe affordability pressure, but their dual character as an investment product means that a substantial part of the segment is absorbed by the rental market rather than by resident owners, and that its supply is highly responsive to credit conditions and may contract sharply when financing becomes expensive. Policymakers who weigh minimum-size regulation or relying on the smallest dwellings to ease affordability should take account of both the genuine accessibility they provide and the investment demand and cyclicity that accompany it. Future research could extend the analysis to transaction-level data, examine the well-being and residential stability of micro-apartment occupants, and compare the Czech experience with that of other Central European markets, where the segment remains similarly understudied.

The results obtained for the Czech market probably say something more general than it seems at first glance. The 22 percent premium found for micro-apartments is not an accident strictly related to Prague or to Czech legislative particularities. It arises because small units concentrate the fixed costs of a real estate transaction (kitchen, bathroom, installations) on a much smaller surface area, and this structural mechanism has no obvious reason to stop at the border. Recent studies on housing affordability in the region show exactly this broader pattern: Matějková and Tichá (2025) document a parallel deterioration in affordability in the Czech Republic, Slovakia, Austria and Poland, while Hromada et al. (2022) analysed common features, from privatization and property restitution to underdeveloped financial markets. Poland already provides direct empirical evidence that the phenomenon is not isolated. A 2025 market analysis shows a 25% increase in interest in small apartments in Polish cities, with micro-units in central Warsaw being explicitly treated by investors as an investment product, not just a housing solution (Poland Insight, 2025). The institutional rental sector (IRS) in Poland has grown rapidly in the same period, reaching tens of thousands of new units, precisely against the backdrop of a structural housing shortage estimated at around 1.5 million units nationwide (JLL, 2024). The combination is similar to that found in the Czech data: demand from budget-conscious buyers, coupled with an investment appetite for small units.

The sensitivity to the cost of credit, clearly observed for the Czech market, seems relevant for the whole CEE region, not just for the Czech Republic. The reports on housing reforms in the Czech Republic and (OECD, 2025) and the analysis of vulnerabilities in the residential real estate sector at the European level (ESRB, 2024) both show a common pattern: the volume of new mortgage loans has fallen significantly in the main EU states as interest rates have risen, more, more of them, more of them these stronger shocks. If micro-apartments react to the cost of credit more intensely than larger categories, as this study for the Czech Republic shows, then in the rest of the CEE the segment could become even more unstable as a source of affordable supply, precisely at the times when they are needed.

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