# Bargain or Bust? Prices, Discounts, and Returns in Berlin's Real Estate Foreclosure Market

Alexander Daminger Simon Wiersma

This (revised) Version: April 15, 2025 Accepted for publication in: *Journal of Real Estate Research* 

This paper investigates foreclosure discounts and their impact on property appreciation rates in Berlin's housing market from 1984 to 2022. Utilizing a comprehensive dataset of 391,420 transactions, we document substantial foreclosure discounts ranging from 20% to 50%, linked to regional business cycles and displaying modest variations between East and West Berlin. Employing hedonic regressions and repeat sales analysis, we find that foreclosed properties in later transactions yield excess returns, with appreciation rates 20.5 percentage points higher than matched non-distressed properties. Conversely, properties auctioned off in foreclosure effects are primarily transaction-specific, with no long-term stigma on properties. Our findings highlight the role of Germany's auction format in shaping discounts, suggesting that institutional investors achieve higher returns due to superior expertise. These results underscore the need for policy reforms to enhance auction transparency and competition, offering insights into market design and efficiency in distressed property markets.

Alexander Daminger: Austrian Institute of Economic Research (WIFO), Arsenal Object 20, 1030 Vienna, Austria (e-mail: alexander.daminger@wifo.ac.at); Simon Wiersma: IRE|BS International Real Estate Business School, University of Regensburg, Universitaetsstrasse 31, 93040 Regensburg, Germany (e-mail: simon.wiersma@irebs.de). Much appreciated are the stimulating comments and discussions by and with Kristof Dascher, Simon Thaler, Tobias Just, Hannah Salzberger, and participants of the 30<sup>th</sup> Annual Meeting of the European Real Estate Society (ERES). We are grateful to the Expert Committee for Property Values in Berlin (*Gutachterausschuss für Grundstueckswerte in Berlin*) for providing us with data on property transactions.

# 1. Introduction

Homeowners facing foreclosure endure significant financial and personal consequences, including housing instability, reduced homeownership, financial distress (Diamond, Guren, and Tan 2020), and adverse health effects (Currie and Tekin 2015). Foreclosure forces these individuals to relinquish their property and relocate, but it also enables the liquidation of their asset to satisfy outstanding debts, with any surplus returned after creditor claims are settled. However, prior research consistently finds that fore-closed properties sell at discounted prices compared to non-distressed properties, a phenomenon widely referred to as the foreclosure discount.

The magnitude of foreclosure discounts has been extensively studied across diverse housing markets. Some studies, such as Campbell, Giglio, and Pathak (2011), Donner, Song, and Wilhelmsson (2016), and Just et al. (2019), report substantial discounts exceeding 20%, while others, including Harding, Rosenblatt, and Yao (2012), suggest that these discounts are often smaller than typical transaction costs. A persistent challenge in this literature is the inability to fully account for unobservable differences between distressed and non-distressed properties, resulting in conditional correlations rather than causal estimates of the discount. Although the existence of foreclosure discounts is well-documented, their precise magnitude and underlying causes remain subjects of debate.<sup>1</sup>

*Research question.* This paper contributes new evidence from an understudied housing market, Berlin, examining the relationship between foreclosure discounts and property appreciation rates. Using a dataset of Berlin housing transactions spanning 1984 to the 2022, we estimate hedonic regressions and employ matching techniques to quantify foreclosure discounts and evaluate their long-term economic implications. In addition, we investigate the role of auction procedures in shaping these discounts, providing insights into the mechanisms underlying distressed property pricing.

*Empirical approach.* Our empirical strategy consists of two primary components. First, we conduct cross-sectional hedonic analyses to estimate foreclosure discounts in Berlin. Second, we apply matching techniques to construct pairs of repeat sales, differentiating between two treatment groups: (1) properties auctioned off in foreclosure transactions

<sup>&</sup>lt;sup>1</sup>Recent advancements, such as Conklin, Coulson, and Diop (2023), address potential omitted variable bias by employing a novel matching approach. Using comprehensive U.S. data, they estimate a foreclosure discount of only 5%, suggesting that prior estimates may overstate the true effect.

and subsequently resold in regular transactions, and (2) properties sold in regular transactions and later foreclosed upon. The matched control group consists of nondistressed repeat sales. Following the methodology of Harding, Rosenblatt, and Yao (2012), we compare appreciation rates across these groups to assess the economic impact of foreclosure transactions on property values.

Results. Our findings reveal significant foreclosure discounts in the Berlin housing market. Hedonic regressions indicate discounts of approximately 50% prior to the 2008/2009 financial crisis, declining to around 20% in recent years. These discounts are notably larger than those reported in other markets, highlighting the unique institutional and economic characteristics of Berlin's housing sector. We also show that foreclosure discounts are tightly connected to the regional business cycle, and vary modestly between East and West Berlin. Furthermore, foreclosed properties exhibit distinct appreciation patterns compared to non-distressed properties. In the first treatment group, where foreclosure transactions are followed by regular sales, annualized appreciation rates exceed those of matched non-distressed properties by 20.5 percentage points, reflecting the average excess return for foreclosure investors. By contrast, in the second treatment group, where regular sales are followed by foreclosure transactions, annualized appreciation rates are 9.6 percentage points lower than those of matched non-distressed properties, indicating a markdown for distressed homeowners. Importantly, this markdown dissipates in subsequent transactions, suggesting that foreclosure discounts are largely transaction-specific and do not persist over the long term.

*Value added.* This paper contributes to two strands of literature. First, it advances research on price differentials between distressed and non-distressed properties by leveraging a comprehensive dataset of housing transactions in Berlin spanning four decades. This work builds on the traditional literature employing hedonic frameworks to estimate foreclosure discounts (e.g., Shilling, Benjamin, and Sirmans 1990; Forgey, Rutherford, and VanBuskirk 1994; Hardin and Wolverton 1996; Springer 1996; Carroll, Clauretie, and Neill 1997), as well as more recent studies that utilize alternative methodologies or broader datasets (e.g., Clauretie and Daneshvary 2009; Campbell, Giglio, and Pathak 2011; Donner, Song, and Wilhelmsson 2016; Donner 2017; Biswas, Fout, and Pennington-Cross 2023; Conklin, Coulson, and Diop 2023). By focusing on Berlin, an international city with unique institutional features, this paper provides new insights into the persistence and drivers of foreclosure discounts in a non-U.S. context.

Second, this study contributes to the literature on real estate auctions by examining the role of Germany's public, open-bid auction format in generating significant foreclosure discounts. We hypothesize that auction dynamics, including the potential for collusion and entry deterrence (Klemperer 2002a), are key mechanisms driving these discounts. In doing so, our work informs broader auction theory as applied to real estate, complementing studies such as Ashenfelter and Genesove (1992); Quan (1994); Mayer (1995); Lusht (1996); Dotzour, Moorhead, and Winkler (1998); Chow, Hafalir, and Yavas (2015); Gunnelin et al. (2023); Niedermayer, Shneyerov, and Xu (2023). By linking foreclosure pricing to auction dynamics, this paper highlights the interplay between institutional design and market outcomes, offering implications for both policymakers and auction practitioners.

*Roadmap.* The structure of this paper is as follows: Section 2 provides an overview of the institutional framework governing real estate foreclosures in Germany, highlighting the unique features of its public auction system. Section 3 details the housing transaction dataset, including its scope, key variables, and representativeness. Sections 4 and 5 present the core empirical analysis, estimating foreclosure discounts and comparing appreciation rates between distressed and non-distressed properties using hedonic regressions and matching techniques. Section 6 evaluates the robustness of the results, discusses potential limitations, and situates the findings within the broader literature. Finally, Section 7 summarizes the key insights and explores their implications for housing policy and auction design.

# 2. Background

The German foreclosure process is governed by the Act on Enforced Auction and Receivership (*Gesetz über die Zwangsversteigerung und die Zwangsverwaltung, ZVG*), which enables creditors to recover claims through enforcement proceedings when debtors default on their mortgages. Upon initiation, the debtor's property is seized, and statecertified appraisers determine its market value. The time between initiation and auction varies depending on case complexity and court workload. Auction dates are publicly announced.

Foreclosure auctions in Germany follow the English Auction format, specifically an open outcry system, where bidders vocally announce their bids. The process is subject to several legal restrictions. First, the minimum bid must cover all superior claims and procedural costs. Second, the bidding is governed by the 5/10 and 7/10 thresholds: the highest bid must reach at least 50% of the appraised market value (5/10 limit), and bids below 70% of the appraised value (7/10 limit) can be rejected by lower-ranking creditors. These thresholds apply only to the first auction date, and failure to meet them typically results in the auction being rescheduled. If a bid satisfies these thresholds and the foreclosure application remains active, the highest bid is accepted, transferring encumbrances and property rights to the winning bidder. However, resale of the property is prohibited until the legal award process is finalized, including the distribution of proceeds and registration in the land register.

A notable distinction between the German and U.S. foreclosure systems lies in the role of creditors. In Germany, creditors generally do not participate in auctions, meaning foreclosed properties do not become part of their real estate owned (REO) inventory. Consequently, foreclosure discounts in Germany are linked exclusively to the auction transaction itself, unlike the U.S., where discounts often reflect subsequent REO sales in the post-foreclosure market.

#### 3. Data

Our dataset comprises all residential property transactions in Berlin from 1984 to 2022, maintained by the city's appraiser committee.<sup>2</sup> As German notaries are legally required to submit all notarized property purchase contracts, the dataset captures the universe of property sales during this period. It includes transaction prices and types, property characteristics, and detailed location information. Before data cleaning, the dataset contains 539,179 transactions.

*Data cleaning.* Our analysis focuses on arms-length real estate transactions, defined as the sale of a single residential property between one seller and one buyer. We exclude special cases, such as package sales, transactions with missing data on property characteristics, or sales of non-marketable properties (e.g., public housing). To ensure comparability, we further restrict the sample to apartment transactions in multifamily buildings, which represent the majority of urban housing transactions and are typically targeted by investors.<sup>3</sup> After these exclusions, the dataset is reduced to 394,842 transactions.

<sup>&</sup>lt;sup>2</sup>For East Berlin, which was part of the German Democratic Republic (GDR) until reunification, transaction data is only available from 1993 onward.

<sup>&</sup>lt;sup>3</sup>Transactions involving one- and two-family houses constitute only 3.3% of the total dataset.

To address outliers and ensure data quality, we apply additional filters based on transaction price, floor space, and apartment size. Specifically, we retain apartments with sale prices between  $\in$  10,000 and  $\in$  1,000,000, floor spaces between 15 m<sup>2</sup> and 300 m<sup>2</sup>, and no more than 10 rooms. After applying these criteria, the final dataset includes 391,420 observations.

*Descriptive statistics.* Table 1 presents descriptive statistics for the sample, which includes 11,137 foreclosure transactions and 380,283 regular sales. Foreclosures account for 2.8% of all transactions and, on average, are associated with lower transaction prices compared to regular sales. Figure 1 illustrates the temporal distribution of foreclosure transactions, which are concentrated in the 2000s. Peak foreclosure shares occurred in 2004 (8.8%) and 2007 (7.9%), while regular sales dominated during the post-2011 housing boom. Between 2002 and 2009, foreclosures consistently accounted for over 5% of all apartment transactions.

This temporal pattern contrasts with the U.S. experience, where foreclosure activity surged after the collapse of Lehman Brothers in 2008. In Berlin, however, distressed apartment transactions peaked earlier, suggesting that local market dynamics were influenced by different institutional or economic factors. Despite these differences, foreclosed and non-distressed properties exhibit broadly similar characteristics in terms of location, apartment type, and floor level, underscoring the comparability of the two groups.

*Geography of Foreclosures.* Figures 2 and 2A depict the spatial distribution of foreclosures across Berlin's 194 zip codes. Zip codes with more than 150 accumulated foreclosures are relatively rare and predominantly located in the western part of the city.<sup>4</sup> To account for differences in transaction volume, we also provide a map illustrating the share of foreclosure transactions as a percentage of all apartment transactions, accumulated from 1984 to 2022. Figure 2B reveals that foreclosure shares are highest in non-central zip codes, with no discernible clustering between East and West Berlin. Overall, foreclosures appear spatially dispersed across the city, with no clear evidence of concentration in specific zip codes or regions. This lack of spatial clustering suggests that foreclosure activity in Berlin is not strongly tied to particular geographic or socioeconomic patterns, distinguishing it from the more localized foreclosure hotspots

<sup>&</sup>lt;sup>4</sup>This pattern holds even when restricting the analysis to post-1992 data, which includes transactions from East Berlin.

|                           |                      | Regular (I | (N=380,283) Foreclosure (N=11,13 |           | e (N=11,137) |                |         |
|---------------------------|----------------------|------------|----------------------------------|-----------|--------------|----------------|---------|
|                           |                      | Mean       | Std. Dev.                        | Mean      | Std. Dev.    | Diff. in Means | р       |
| Transaction price (EUR)   |                      | 171,693.05 | 150,099.38                       | 65,253.28 | 62,187.13    | -106,439.78    | < 0.001 |
| Age of building (years)   |                      | 59.86      | 40.40                            | 68.24     | 35.29        | 8.37           | < 0.001 |
| Number of rooms           |                      | 2.48       | 1.03                             | 2.33      | 0.99         | -0.15          | < 0.001 |
| Floor space (sqm)         |                      | 71.36      | 30.62                            | 66.42     | 27.53        | -4.94          | < 0.001 |
| Bathroom (dummy)          |                      | 0.92       | 0.27                             | 0.90      | 0.30         | -0.02          | < 0.001 |
| Separate WC (dummy)       |                      | 0.14       | 0.35                             | 0.12      | 0.32         | -0.02          | < 0.001 |
| Balcony (dummy)           |                      | 0.48       | 0.50                             | 0.41      | 0.49         | -0.07          | < 0.001 |
| Attic (dummy)             |                      | 0.01       | 0.10                             | 0.01      | 0.12         | 0.00           | < 0.001 |
| Basement (dummy)          |                      | 0.74       | 0.44                             | 0.70      | 0.46         | -0.04          | < 0.001 |
| Atelier (dummy)           |                      | 0.00       | 0.02                             | 0.00      | 0.03         | 0.00           | 0.463   |
| Hobby room (dummy)        |                      | 0.01       | 0.10                             | 0.01      | 0.11         | 0.00           | 0.101   |
| Storage room (dummy)      |                      | 0.57       | 0.49                             | 0.57      | 0.50         | 0.00           | 0.432   |
| Hallway (dummy)           |                      | 0.19       | 0.39                             | 0.16      | 0.36         | -0.03          | < 0.001 |
| Corridor (dummy)          |                      | 0.84       | 0.36                             | 0.88      | 0.33         | 0.03           | < 0.001 |
| Elevator (dummy)          |                      | 0.37       | 0.48                             | 0.24      | 0.43         | -0.13          | < 0.001 |
| Private garage (dummy)    |                      | 0.23       | 0.42                             | 0.22      | 0.41         | -0.01          | 0.177   |
| Collective garage (dummy) |                      | 0.02       | 0.13                             | 0.01      | 0.10         | -0.01          | < 0.001 |
| Parking lot (dummy)       |                      | 0.06       | 0.23                             | 0.05      | 0.23         | 0.00           | 0.106   |
|                           |                      | N          | Pct.                             | N         | Pct.         |                |         |
| Sale Period               | 1984-1990            | 36,751     | 9.7                              | 1,022     | 9.2          |                |         |
|                           | 1991–1995            | 23,233     | 6.1                              | 457       | 4.1          |                |         |
|                           | 1996-2000            | 45,433     | 11.9                             | 1,411     | 12.7         |                |         |
|                           | 2001-2005            | 42,595     | 11.2                             | 2,677     | 24.0         |                |         |
|                           | 2006-2010            | 54,586     | 14.4                             | 3,301     | 29.6         |                |         |
|                           | 2011-2015            | 83,773     | 22.0                             | 1,654     | 14.9         |                |         |
|                           | 2016-2022            | 93,912     | 24.7                             | 615       | 5.5          |                |         |
| Location quality          | Basic                | 151,967    | 40.0                             | 5,163     | 46.4         |                |         |
|                           | Good                 | 90,955     | 23.9                             | 2,659     | 23.9         |                |         |
|                           | Intermediate         | 127,912    | 33.6                             | 3,091     | 27.8         |                |         |
|                           | Very Good            | 9,449      | 2.5                              | 224       | 2.0          |                |         |
| Type of Apartment         | Attic Apartment      | 23,059     | 6.1                              | 670       | 6.0          |                |         |
|                           | Duplex Apartment     | 9,188      | 2.4                              | 227       | 2.0          |                |         |
|                           | Floor Apartment      | 346,025    | 91.0                             | 10,184    | 91.4         |                |         |
|                           | Loft                 | 592        | 0.2                              | . 4       | 0.0          |                |         |
|                           | Penthouse            | 658        | 0.2                              | 3         | 0.0          |                |         |
|                           | Storefront Apartment | 353        | 0.1                              | 41        | 0.4          |                |         |
|                           | Terrace Apartment    | 408        | 0.1                              | 8         | 0.1          |                |         |
| Floor level               | Basement floor       | 1,331      | 0.4                              | 58        | 0.5          |                |         |
|                           | First floor          | 66,242     | 17.4                             | 2,431     | 21.8         |                |         |
|                           | Mezzanine floor      | 3,904      | 1.0                              | 112       | 1.0          |                |         |
|                           | Upper floors         | 308,806    | 81.2                             | 8,536     | 76.6         |                |         |

# TABLE 1. Descriptive Statistics of Transactions

The table reports descriptive statistics on the cleaned sample of housing transactions in Berlin from 1984 to 2022. <u>Sources:</u> Expert Commitee for Property Values in Berlin; authors' calculations.



FIGURE 1. Foreclosure incidence over time

This figure illustrates the incidence of foreclosure transactions in Berlin over time. The grey bars represent the absolute number of foreclosures per year (left axis), while the solid line depicts the share of foreclosure transactions as a percentage of all apartment transactions in Berlin (right axis). <u>Sources:</u> Expert Commitee for Property Values in Berlin; authors' calculations.

observed in other urban housing markets (e.g., Gutiérrez and Arauzo-Carod (2018) on Catalonian cities).

*Market participants in foreclosures.* We assume that foreclosed properties are predominantly sold by distressed homeowners and purchased by specialized investors. Our data provides partial support for this assumption. On the seller side, over 90% of foreclosed properties are sold by private individuals.<sup>5</sup> On the buyer side, approximately one-third of purchasers are corporations, while the remaining two-thirds are recorded as private individuals. Although this breakdown suggests that a majority of buyers are not institutional investors, we hypothesize that a substantial share of private buyers are nevertheless speculative investors who just do not formally operate as corporations.

<sup>&</sup>lt;sup>5</sup>The data does not distinguish between owner-occupiers and landlords, leaving the nature of private sellers ambiguous.



A. Number of foreclosures





#### FIGURE 2. Number and share of foreclosures by zip code, 1984-2022

This figure illustrates the spatial distribution of foreclosures in Berlin by zip code, accumulated over the period from 1984 to 2022. It comprises two maps: Figure 2A depicts the absolute number of foreclosures, while Figure 2B shows the share of foreclosures as a percentage of all apartment transactions. To classify the data, we apply the Jenks natural breaks optimization method, which minimizes within-class variance while maximizing between-class variance, ensuring an optimal grouping of values. The maps employ a color gradient, with darker shades of purple indicating a higher number or share of foreclosures. For reference, the black solid line represents the approximate location of the Berlin Wall prior to re-unification, delineating East and West Berlin. <u>Sources:</u> Expert Commitee for Property Values in Berlin; Berlin-Brandenburg Statistics Office; authors' calculations.

# 4. Empirical Strategy

We employ two complementary empirical approaches to evaluate the impact of foreclosure status on property prices and appreciation rates. First, we estimate foreclosure discounts using hedonic dummy models applied to cross-sectional data, which capture price differentials between foreclosed and non-foreclosed properties. This approach leverages a comprehensive and representative sample of housing transactions, encompassing both new and existing units. However, a key limitation is its inability to control for unobservable factors that may influence prices. Second, we analyze a repeat sales sample to compare price appreciation and investment returns between foreclosed and non-foreclosed properties. While this approach accounts for both observable and unobservable characteristics by focusing on within-property price changes over time, it is restricted to a subset of transactions, potentially introducing sample selection bias.

#### 4.1. Identification of the Foreclosure Discount in Prices

To estimate the foreclosure discount in the Berlin housing market, we follow the literature on distressed sales and employ hedonic models with a foreclosure indicator variable. Our baseline model, adapted from Campbell, Giglio, and Pathak (2011), is specified as follows:

(1) 
$$y_{izt} = \alpha_{zt} + \beta F_i + \gamma X_i + \epsilon_{izt}$$

where  $y_{izt}$  represents the log price of apartment *i* in zip code *z* and year *t*,  $F_i$  is a binary variable indicating foreclosure status,  $X_i$  is a vector of apartment characteristics, and  $\epsilon_{izt}$  is the error term capturing random shocks to apartment prices. We include zip code-year fixed effects,  $\alpha_{zt}$ , to control for time-varying price differences across zip codes. In this empirical specification, the coefficient  $\hat{\beta}$  captures the average, time-invariant foreclosure discount.

Our dataset provides detailed information on apartment characteristics, allowing us to control for a rich set of covariates. The vector  $X_i$  includes variables such as the log of floor space, number of rooms, building age (and its quadratic term), and additional apartment features.<sup>6</sup>

<sup>&</sup>lt;sup>6</sup>These features include the presence of a bathroom, separate WC, balcony, attic, basement, hobby room, storage room, hallway, corridor, elevator, private garage, collective garage, or private parking spot.

To examine whether foreclosure discounts vary over time, we extend our baseline model by including an interaction term between the foreclosure indicator  $F_i$  and year fixed effects. This "dynamic" model allows us to estimate time-varying foreclosure discounts:

(2) 
$$y_{izt} = \alpha_{zt} + \beta F_i + \sum_{t=1985}^{2022} \delta_t F_i \times Y_t + \gamma X_i + \epsilon_{izt}$$

where  $Y_t$  is a vector of year fixed effects (with 1984 as the omitted base year), and  $\delta_t$  represents a vector of coefficients capturing the variation in the foreclosure discount over time. Both models are estimated using ordinary least squares (OLS) with standard errors clustered at the zip code level to account for spatial correlation. The foreclosure discount is reported in percentage terms and calculated as  $e^{\hat{\beta}} - 1$  for the static model and  $e^{\hat{\beta}+\hat{\delta}_t} - 1$  for the dynamic model.

While these models quantify the correlation between foreclosure status and apartment prices, they do not fully address potential unobserved factors that may confound the foreclosure indicator  $F_i$ . As a result, our findings should be interpreted as conditional correlations rather than causal estimates. Specifically, we can determine whether foreclosed apartments sold at lower prices, but not whether foreclosure status *caused* these price differences.

#### 4.2. Identification of the Foreclosure Discount in Appreciation Rates

To calculate appreciation rates, we extract repeat sales from our dataset. Since repeat sales are not directly identified, we link transactions based on geo-coordinates and apartment identifiers from the partition plan. To ensure consistency, we verify that apartment characteristics (e.g., floor space, number of rooms, presence of a bathroom or balcony) remain unchanged across transactions, excluding properties that may have undergone renovations or modifications.

We define a repeat sale as an apartment *i* sold at time *t* for price  $p_{i,t}$  and resold at time t + 1 for price  $p_{i,t+1}$ . This framework allows us to compute appreciation rates or gross returns over the holding period.<sup>7</sup> To standardize comparisons, we calculate annualized

We also control for location quality, apartment type, and floor level. See Table 1 for a full overview of these variables.

<sup>&</sup>lt;sup>7</sup>Gross returns exclude transaction costs. In Berlin, regular sales incur a property transfer tax of 6%, registry costs of 0.4%, and notary fees of 1%, while foreclosures incur court surcharge fees of 1.1% (but no



FIGURE 3. Repeat Sales of Apartments and Assignment to Treatment Arms

This diagram illustrates how we (i) identify repeat sales from the dataset and (ii) assign repeat sales (consisting of two transactions of the same apartment i, j, or k) to treatment arms. Apartments observed in more than two transactions (i = j = k) are also included. These treatment and control groups serve as the basis for our matching analysis. <u>Sources:</u> Authors' illustration.

appreciation rates for each repeat sale.<sup>8</sup> For holding periods shorter than one year, we round the holding period up to one year to avoid inflated appreciation rates from short-term transactions.<sup>9</sup> We exclude repeat sales involving two foreclosure transactions and omit extreme outliers with appreciation rates above the 99th percentile.

*"Treatments".* Following Doerner and Leventis (2015) and Donner (2017), we define two treatment groups and one control group to analyze returns associated with foreclosure transactions.<sup>10</sup> Figure 3 illustrates the classification process. Treatment arm 1 includes apartments acquired through foreclosure and subsequently sold in regular transactions (4,745 observations). We hypothesize that these properties are targeted by investors seeking discounts and capital gains through resale. Treatment arm 2 comprises apartments initially purchased in regular transactions but later sold through foreclosure (5,459 observations). We expect distressed owners in this group to incur losses due to unfavorable auction processes and the stigma associated with foreclosure.

In total, we identify 10,204 repeat sales across the two treatment arms, involving 7,785 unique apartments.<sup>11</sup> The control group comprises 100,472 repeat sales involving

notary fees). Total transaction costs are approximately 7.5% for regular sales and 7.4% for foreclosures.

<sup>11</sup>Repeat sales include apartments observed in more than two transactions during the study period.

<sup>&</sup>lt;sup>8</sup>Annualized appreciation is calculated as  $\left(\frac{p_{it+1}}{p_{it}}\right)^{\frac{1}{p}} - 1$ , where *p* represents the number of years between *t* and *t* + 1. Time differences are measured in weeks and divided by 52.25.

<sup>&</sup>lt;sup>9</sup>For example, an apartment purchased for  $\in$  100,000 and resold for  $\in$  150,000 after 90 days would yield an annualized return of 418%, compared to 50% over one year. Such extreme short-term returns are economically irrelevant, as turnover in that pace is uncommon in real estate markets due to institutional constraints (need for notary involvement, entry in the land register, or payment of real estate transfer taxes).

<sup>&</sup>lt;sup>10</sup>We use the term "treatment" loosely, as foreclosure status is of course not exogenously or randomly assigned.

two regular transactions, representing the counterfactual scenario without foreclosure involvement.

*Matching.* To estimate the effect of foreclosure on appreciation rates, we construct a counterfactual scenario using nearest neighbor matching. This method pairs treated repeat sales with control repeat sales based on relevant covariates. We compare two distance metrics: propensity score and Mahalanobis distance. While propensity scores reduce the multidimensional covariate space to a single dimension, Mahalanobis distance preserves the original covariate space, enabling more balanced matching on individual variables (Rosenbaum 2020). Given the importance of achieving precise matching on individual housing characteristics, we adopt Mahalanobis distance.<sup>12</sup>

We match on six covariates: apartment size, age, number of rooms, holding period, date of the second transaction, and zip code (with exact matching on zip code). These variables are selected to satisfy the conditional independence assumption, ensuring that treatment assignment is independent of potential outcomes after matching.<sup>13</sup> We use 1:1 matching without replacement, ensuring that each control repeat sale is matched to only one treated repeat sale.<sup>14</sup>

Figure 4 illustrates the covariate balance between treatment and control groups before and after matching. Prior to matching, the two groups exhibited significant imbalances: control apartments were larger, newer, and had longer holding periods on average. Following nearest neighbor matching, balance improved across all covariates. Table 2 confirms that the matched treatment and control groups are well-balanced, with no statistically significant differences in apartment age, number of rooms, or size. Differences in holding period and date of the second transaction were also reduced, though small differences remain statistically significant.<sup>15</sup>

Using the matched dataset, we estimate the effect of foreclosure on annualized appreciation rates. Our analysis employs two complementary strategies. First, we use a multi-arm design to compare average appreciation rates across treatment and control

<sup>71%</sup> of these apartments generate only one repeat sale in one treatment arm, while the remaining 29% generate two or more repeat sales.

<sup>&</sup>lt;sup>12</sup>There are additional critiques of propensity score matching in observational studies. See, for example, King and Nielsen (2019).

<sup>&</sup>lt;sup>13</sup>See Rubin (1977) for a discussion of the conditional independence assumption.

<sup>&</sup>lt;sup>14</sup>While k:1 matching with k > 1 can improve precision, diminishing returns are observed beyond 4:1 matching (Rosenbaum 2020). Our results are robust to alternative matching procedures, including k:1 matching with up to five control units (see Appendix Table A6).

<sup>&</sup>lt;sup>15</sup>Appendix Figure A1 demonstrates that the distributions of these two variables are nearly identical, with only minor differences in means persisting.



FIGURE 4. Covariate Balance before and after Matching

This figure illustrates the covariate balance between treatment and control groups before and after matching. Prior to matching, balance was particularly low for the holding period and the date of the second sale. Nearest neighbor matching significantly improved balance across all covariates, bringing differences within a threshold of 0.1. For brevity, balance results for zip code are not reported. <u>Sources:</u> Expert Committee for Property Values in Berlin; authors' calculations.

groups. Second, we extend this framework to explore heterogeneous effects by holding period, interacting treatment indicators with holding period dummies to capture variation in appreciation rates over different investment horizons.

#### 4.2.1. The Effect on Housing Appreciation

We begin by estimating whether a foreclosure transaction in a repeat sale affects the annualized appreciation rate compared to a non-foreclosure control. Specifically, we estimate the following model:

(3) 
$$y_i = \alpha + \beta_1 T 1_i + \beta_2 T 2_i + \epsilon_i,$$

where  $y_i$  denotes the annualized appreciation rate for repeat sale *i*.  $T1_i$  is a binary variable indicating a repeat sale in which a foreclosure is followed by a regular sale (Treatment 1), and  $T2_i$  is a binary variable for the reverse sequence, where a regular

| Control | (N=10,204)                                               | Treated (N=10,204)                                                        |                                                                                                           |                                                                                                                                                    |                                                        |
|---------|----------------------------------------------------------|---------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|
| Mean    | Std. Dev.                                                | Mean                                                                      | Std. Dev.                                                                                                 | Diff. in Means                                                                                                                                     | р                                                      |
| 71.8    | 34.5                                                     | 71.5                                                                      | 34.7                                                                                                      | -0.3                                                                                                                                               | 0.565                                                  |
| 2.3     | 1.0                                                      | 2.3                                                                       | 1.0                                                                                                       | 0.0                                                                                                                                                | 0.477                                                  |
| 64.4    | 25.8                                                     | 64.9                                                                      | 26.7                                                                                                      | 0.4                                                                                                                                                | 0.230                                                  |
| 8,866.4 | 2,985.5                                                  | 8,710.3                                                                   | 2,919.6                                                                                                   | -156.1                                                                                                                                             | <0.001                                                 |
| 7.5     | 6.2                                                      | 7.3                                                                       | 6.1                                                                                                       | -0.2                                                                                                                                               | 0.057                                                  |
|         | Control<br>Mean<br>71.8<br>2.3<br>64.4<br>8,866.4<br>7.5 | Control (N=10,204)MeanStd. Dev.71.834.52.31.064.425.88,866.42,985.57.56.2 | Control (N=10,204)TreatedMeanStd. Dev.Mean71.834.571.52.31.02.364.425.864.98,866.42,985.58,710.37.56.27.3 | Control (N=10,204)Treated (N=10,204)MeanStd. Dev.MeanStd. Dev.71.834.571.534.72.31.02.31.064.425.864.926.78,866.42,985.58,710.32,919.67.56.27.36.1 | $\begin{array}{c c c c c c c c c c c c c c c c c c c $ |

**TABLE 2.** Covariate Balance after Matching

This table presents distribution parameters for the matched dataset. The age of the building and holding period are measured in years, while living space is measured in square meters. The date of the second sale is measured as the number of days between the second sale in a repeat sale and January 1, 1984. For brevity, balance results for zip code are not reported. <u>Sources:</u> Expert Committee for Property Values in Berlin; authors' calculations.

sale is followed by a foreclosure (Treatment 2).<sup>16</sup>

In this specification,  $\alpha$  represents the baseline appreciation rate for the control group (non-foreclosure repeat sales). The coefficient  $\beta_1$  captures the deviation in appreciation rates for Treatment 1, where foreclosure buyers are expected to achieve a profit premium. A positive and statistically significant  $\hat{\beta}_1$  would indicate that foreclosed properties generate higher returns upon resale. Conversely,  $\beta_2$  measures the deviation for Treatment 2, where foreclosure sellers are hypothesized to incur a markdown. A negative and statistically significant  $\hat{\beta}_2$  would suggest that foreclosed properties sell at a discount compared to non-distressed properties.

Additionally, we extend this analysis by exploring how the effect of foreclosures on appreciation rates varies across key dimensions, including the holding period, the type of foreclosure investor, and the winning bid. These extensions allow us to identify potential heterogeneity in the impact of foreclosure transactions, shedding light on the economic mechanisms underlying these effects.

#### 4.2.2. The Persistence of Foreclosure Effects

We investigate whether the effects of foreclosure are transient – associated with the *transaction* – or persistent, reflecting a stigma attached to the *apartment* itself. If fore-

<sup>&</sup>lt;sup>16</sup>The concern of "contamination bias" in multi-treatment regressions (Goldsmith-Pinkham, Hull, and Kolesár 2024; Imbens and Wooldridge 2009) is not relevant in this context, as we do not condition on additional controls.



FIGURE 5. Appreciation Rates of Treatment and Control Apartments

This diagram illustrates the sample construction for analyzing the persistence of foreclosure effects. For the treatment group, we identify "triple" repeat sales of apartment i, where the middle transaction is a foreclosure. For the control group, we use standard ("double") repeat sales from two individual sales of apartment j. Appreciation rates are calculated between the first and last sale in both groups. <u>Sources:</u> Authors' illustration.

closure effects are persistent, we would expect lower appreciation rates in subsequent non-distressed transactions involving previously foreclosed properties.

To examine this, we leverage the long time horizon of our dataset, which captures multiple transactions of the same apartments. Following Chang and Li (2014), we identify "triple" repeat sales, where the middle transaction is a foreclosure, and compute the appreciation rate between the first and last sale, excluding the foreclosure transaction. For the control group, we use "double" repeat sales without foreclosure involvement (see Figure 5). This approach allows us to isolate the long-term impact of foreclosure on subsequent appreciation rates.

To assess the persistence of foreclosure effects, we estimate the following model:

(4) 
$$y_i = \alpha + \beta_1 T_i + \epsilon_i$$

where  $y_i$  represents the annualized appreciation rate of repeat sale *i*, and  $T_i$  is a binary variable indicating a "triple" sale sequence where the middle foreclosure transaction is omitted. The coefficient  $\alpha$  represents the baseline appreciation rate for control repeat sales, while  $\beta_1$  captures the deviation for apartments that experienced a foreclosure between two regular sales.

If the effects of foreclosure are temporary and limited to the transaction itself, we expect  $\hat{\beta}_1$  to be statistically insignificant, indicating no long-term impact on appreciation rates. Conversely, if foreclosure imposes a persistent stigma on the apartment, we expect  $\hat{\beta}_1$  to be negative and statistically significant, reflecting lower long-term appreciation rates for previously foreclosed properties.

#### 5. Results

This section presents our findings on foreclosure discounts, derived from Equations 1 and 2, and on foreclosure effects on appreciation rates, based on variations of Equations 3 and 4. Since these approaches examine different outcomes – price differentials and appreciation rates – we synthesize the findings to ensure consistency and reliability across methodologies.

#### 5.1. Foreclosure Effects on Transaction Prices

Figure 6 illustrates the static (dashed line) and dynamic (solid line) foreclosure discounts over time, estimated using hedonic models. Detailed estimates from the dynamic model are reported in Table 3, with full regression results available in Appendix Table A1.

Our analysis reveals substantial and time-varying foreclosure discounts in Berlin. The static model estimates an average foreclosure discount of 39%, while the dynamic model uncovers cyclical patterns in the discount, reflecting broader market trends.

Following reunification in 1989, foreclosure discounts initially declined, consistent with the "post-reunification boom" and investor optimism regarding Berlin's future economic importance (Holtemöller and Schulz 2010). However, as these expectations failed to materialize, the housing market contracted, and the discount increased by 19.1 percentage points between 1996 and 2004.<sup>17</sup>

From 2005 onward, the foreclosure discount steadily decreased, coinciding with the broader housing boom in Germany. Notably, the 2008 collapse of Lehman Brothers had no discernible impact on Berlin's foreclosure discounts, which continued to decline during the crisis. This resilience can be attributed to two factors: (1) Germany

<sup>&</sup>lt;sup>17</sup>Between 1991 and 1998, East Germany and Berlin benefited from generous depreciation allowances, which incentivized overinvestment and led to overcapacity in the housing market, further affecting prices (Michelsen and Weiß 2010).



FIGURE 6. Foreclosure discounts from hedonic estimates

The dashed line shows the static discount from a model with a single foreclosure dummy, while the solid line shows the dynamic discount from a model with year interactions. <u>Sources:</u> Expert Commitee for Property Values in Berlin; authors' calculations.

avoided the pre-crisis speculative housing bubble seen in other countries, and (2) prudent lending practices insulated the German housing market from broader financial market distortions. Consequently, while foreclosure activity and house prices declined sharply in many other countries during the global financial crisis, Germany remained an exception (Just and Ebner 2006; Voigtländer 2014).

Since 2010, the number of foreclosures has significantly declined, plateauing after 2015 (see Figure 1). This trend may reflect defaulting borrowers' preference to sell properties on the open market during the real estate boom, as sale prices often exceeded the amounts owed to lenders.<sup>18</sup> However, most recently, the foreclosure discount has risen again, reaching 19% in 2022.

*East and West Berlin.* A key question in the Berlin context is whether foreclosure discounts differ between East and West Berlin, given their distinct historical and institutional backgrounds. To investigate this, we re-estimate our hedonic models (Equations

<sup>&</sup>lt;sup>18</sup>Anecdotal evidence suggests that foreclosures during this period often involved legal disputes, such as divorces or inheritance issues, rather than financial distress.

| Year | Discount (%) | Year | Discount (%)   | Year | Discount (%) | Year | Discount (%) |
|------|--------------|------|----------------|------|--------------|------|--------------|
| 1984 | -32.5        | 1994 | -38.7          | 2004 | -50.9        | 2014 | -22.2        |
| 1985 | -37.3        | 1995 | -34.0          | 2005 | -48.9        | 2015 | -18.2        |
| 1986 | -40.5        | 1996 | -30.8          | 2006 | -47.0        | 2016 | -14.8        |
| 1987 | -46.1        | 1997 | -33.3          | 2007 | -46.5        | 2017 | -14.6        |
| 1988 | -32.0        | 1998 | -43.4          | 2008 | -43.9        | 2018 | -8.6         |
| 1989 | -35.3        | 1999 | -41.0          | 2009 | -40.1        | 2019 | -18.1        |
| 1990 | -24.4        | 2000 | -47 <b>.</b> 6 | 2010 | -34.8        | 2020 | -20.5        |
| 1991 | -26.2        | 2001 | -44.2          | 2011 | -26.0        | 2021 | -16.3        |
| 1992 | -26.3        | 2002 | -48.6          | 2012 | -21.1        | 2022 | -19.1        |
| 1993 | -35.5        | 2003 | -50.5          | 2013 | -19.9        |      |              |

TABLE 3. Dynamic Foreclosure Discount from Hedonic Estimates

This table shows the dynamic discounts from Equation 2, also visualized in Figure 6. <u>Sources:</u> Expert Committee for Property Values in Berlin; authors' calculations.

1 and 2) separately for apartments located in East Berlin (formerly part of the German Democratic Republic) and West Berlin.<sup>19</sup>

Figure 7 presents the results. The dashed lines represent the static foreclosure discount (Equation 1), while the solid lines show the dynamic discount (Equation 2). Green dots indicate estimates for East Berlin, and orange triangles for West Berlin.

Our analysis reveals a slightly larger static foreclosure discount in East Berlin (-43%) compared to West Berlin (-37%).<sup>20</sup> The dynamic foreclosure discount follows a similar trajectory in both regions, although the discount curve for East Berlin is consistently lower, indicating higher discounts.

The larger discounts in East Berlin may reflect differences in housing market conditions stemming from its post-reunification legacy. East Berlin faced significant challenges in integrating into a market-based economy, including overinvestment in housing during the 1990s, slower economic growth, and lower housing demand relative to West Berlin (Michelsen and Weiß 2010; Holtemöller and Schulz 2010). Despite these differences, the overall gap in foreclosure discounts between East and West Berlin remains modest.

<sup>&</sup>lt;sup>19</sup>We considered including an interaction term for East/West Berlin, but this would introduce collinearity with our zip code-year fixed effects  $\alpha_{zt}$ . Since controlling for local, time-varying price differences is crucial for precision, we opted against this approach.

 $<sup>^{20}</sup>$ We tested whether this discrepancy arises from the fact that East Berlin foreclosures only appear in the dataset from 1998 onwards, while West Berlin data begins in 1984. Excluding pre-1998 West Berlin data marginally changes the static discount for West Berlin to -38%.



FIGURE 7. Variation in foreclosure discounts between East and West Berlin

This figure shows the discount for foreclosed apartments from hedonic dummy models with a sample split by apartments being located in East or West Berlin. The dashed lines show the discount from a model including a single foreclosure dummy which is fixed over time (Equation 1) while the solid lines show the discount calculated from a model which additionally includes interactions of the foreclosure dummy with year fixed effects (Equation 2). For both these types of lines, East Berlin is indicated green on screen and with dots, while West Berlin is indicated orange on screen and with triangles. <u>Sources:</u> Expert Commitee for Property Values in Berlin; authors' calculations.

*Business Cycle.* Figure 6 for Berlin and Figure 7 for East and West Berlin suggest a cyclical component to the foreclosure discount, indicating its linkage to the broader economic situation and the business cycle. To explore the relationship between our estimated dynamic foreclosure discounts and Berlin's business cycle, we employ time-series methods to analyze a new dataset of quarterly GDP data at the regional level. In Germany, official sources provide only annual state-specific GDP information. However, Lehmann and Wikman (2025) offer a time-series of quarterly GDP estimates for Berlin and the other 15 German states, beginning in the last quarter of 1993.<sup>21</sup>

We utilize these quarterly GDP estimates for Berlin to date regional business cycles

<sup>&</sup>lt;sup>21</sup>Berlin holds a unique position within the NUTS classification system in Germany. It is simultaneously designated as a NUTS-1, NUTS-2, and NUTS-3 region. As a city-state, Berlin is treated as a single statistical unit at all three levels, unlike other federal states that are subdivided further at the NUTS-2 and NUTS-3 levels. This streamlined classification reflects Berlin's administrative structure and its role as both a state (Land) and an urban district (kreisfreie Stadt).

using established algorithms from the literature. Specifically, we employ the dating algorithm developed by Bry and Boschan (1971) and its extension to quarterly data by Harding and Pagan (2002) to identify expansion and recession phases in economic activity from 1993 to 2022. As these classical business cycles are detected in the level of the series, we first transform the seasonally and calendar-adjusted quarter-on-quarter real GDP growth rates to levels by setting the third quarter of 1993 to 100 and multiplying this base value by the quarterly estimates.

The Bry and Boschan (1971) algorithm delineates the business cycle into two phases: expansions, characterized by increasing economic activity, and recessions, marked by decreasing activity. These phases are connected by peaks and troughs, where a peak (trough) marks the transition from expansion to recession (or vice versa). A complete business cycle is defined by the passage through each phase once.

We calibrate our cycle dating algorithm for Berlin using standard parameters from the literature (Harding and Pagan 2002; Schirwitz 2009), setting the time span that defines peaks and troughs to two quarters and requiring expansions and recessions to last at least two quarters.

Figure 8 illustrates the six recession periods identified in Berlin's regional business cycle since 1993. The longest recession spanned from 2001 Q1 to 2004 Q1, lasting 12 quarters. However, the recession with the largest GDP contraction occurred between 2019 Q4 and 2020 Q2 with COVID, during which Berlin's economy contracted by 12.7 percent.

We integrate this information on expansion and recession quarters into our housing transaction dataset to assess how the foreclosure discount varies with economic conditions. First, we estimate how the foreclosure discount changes during recessionary periods by creating a dummy variable that equals one for quarters of economic down-turns and zero during expansions. We modify Equation 2 by interacting the foreclosure dummy with this recession indicator (instead of with a vector of year fixed effects). In a second step, we investigate the heterogeneous impact of each recession on the foreclosure discount. We therefore estimate another variant of Equation 2, interacting the foreclosure dummy with a vector of dummies for individual recession phases. In this setup, (the average of) expansion periods serve as the reference category.

Table 4 presents the regression results for Berlin as a whole (columns (1) and (2)), West Berlin (columns (3) and (4)), and East Berlin (columns (5) and (6)). The first column for each region captures the "general" effect of recessions on foreclosure discounts, while the second column examines the impact of specific recession periods. Column (1)



FIGURE 8. Recession Periods in Berlin's Regional Business Cycle 1993–2022

This figure shows Berlin's regional business cycles since 1993. The blue line (left axis) shows the development of real GDP with 1993 Q3 set to 100. The grey bars (right axis) show quarter-on-quarter changes in real GDP. Red shaded areas mark recession periods: 1 - 1995 2nd quarter to 1997 3rd quarter. 2 - 1998 1st quarter to 1999 2nd quarter. 3 - 2001 1st quarter to 2004 1st quarter. 4 - 2008 3rd quarter to 2009 1st quarter. 5 - 2011 4th quarter to 2013 1st quarter. 6 - 2019 4th quarter to 2020 2nd quarter. Sources: Lehmann and Wikman (2025); authors' calculations.

indicates that the estimated foreclosure discount in Berlin during expansion periods, relative to non-foreclosed properties, is approximately -38.7% ( $e^{-0.489} - 1$ ). During recessions, this discount increases to approximately -40.6% ( $e^{-0.489-0.031} - 1$ ), representing an additional markdown of 1.9 percentage points. This effect is notably driven by East Berlin (column (5)), where the foreclosure discount is -42.5% during expansions and increases by 3 percentage points to -45.5% during recessions. In contrast, West Berlin (column (3)) shows a foreclosure discount of -37% during expansions, with no statistically significant increase during recessions.

Column (2) reveals that the foreclosure discount in Berlin does not uniformly increase across all recessionary phases. For instance, during the downturns from 1995 Q3 to 1997 Q3, 2012 Q1 to 2013 Q1, and 2020 Q1 to 2020 Q2, the foreclosure discount actually *decreased* by 10 to 27 log points. However, the most pronounced negative impact on foreclosed property prices occurred during the recession from 2001 Q2 to 2004 Q1, where the discount was approximately 10 percentage points higher (-48.5%) than

|                                             | Dep. Var.: Ln(Transaction price) |                                  |                        |                                  |                        |                                |  |
|---------------------------------------------|----------------------------------|----------------------------------|------------------------|----------------------------------|------------------------|--------------------------------|--|
| -                                           | Berli                            | in                               | West B                 | erlin                            | East Berlin            |                                |  |
| -                                           | (1)                              | (2)                              | (3)                    | (4)                              | (5)                    | (6)                            |  |
| Foreclosure                                 | -0.489***<br>(0.009)             | -0.488***<br>(0.009)             | $-0.462^{***}$ (0.011) | -0.461***<br>(0.011)             | $-0.553^{***}$ (0.018) | $-0.552^{***}$ (0.018)         |  |
| For<br>eclosure $\times$ Recession          | -0.030**<br>(0.015)              |                                  | -0.027<br>(0.017)      |                                  | $-0.053^{*}$ (0.031)   |                                |  |
| For<br>eclosure $\times$ 1995-Q3 to 1997-Q3 |                                  | 0.105***<br>(0.025)              |                        | 0.076***<br>(0.026)              |                        |                                |  |
| For<br>eclosure $\times$ 1998-Q2 to 1999-Q2 |                                  | -0.038<br>(0.034)                |                        | -0.055 (0.038)                   |                        | -0.012<br>(0.059)              |  |
| For<br>eclosure $\times$ 2001-Q2 to 2004-Q1 |                                  | -0.175 <sup>***</sup><br>(0.020) |                        | -0.158 <sup>***</sup><br>(0.022) |                        | -0.230***                      |  |
| For<br>eclosure $\times$ 2008-Q4 to 2009-Q1 |                                  | -0.070 <sup>***</sup><br>(0.026) |                        | -0.056 <sup>*</sup><br>(0.034)   |                        | -0.070 <sup>*</sup><br>(0.036) |  |
| For<br>eclosure $\times$ 2012-Q1 to 2013-Q1 |                                  | 0.253***                         |                        | 0.270***                         |                        | 0.242***                       |  |
| For<br>eclosure $\times$ 2020-Q1 to 2020-Q2 |                                  | 0.269**<br>(0.119)               |                        | 0.269*<br>(0.154)                |                        | 0.186<br>(0.126)               |  |
| Full hedonic controls                       | $\checkmark$                     | $\checkmark$                     | $\checkmark$           | $\checkmark$                     | $\checkmark$           | $\checkmark$                   |  |
| ZIP code $\times$ Year FE                   | $\checkmark$                     | $\checkmark$                     | $\checkmark$           | $\checkmark$                     | $\checkmark$           | $\checkmark$                   |  |
| Num. obs.<br>R <sup>2</sup>                 | 340,723<br>0.849                 | 340,723<br>0.849                 | 217,991<br>0.843       | 217,991<br>0.843                 | 122,732<br>0.854       | 122,732<br>0.855               |  |

#### TABLE 4. Estimates of Business Cycles' Impact on the Foreclosure Discount

OLS regressions with the log of the transaction price as response variable. Full hedonic controls means that all housing related characteristics reported in Table A1 are included in the regressions as independent variables, but not displayed. Standard errors are clustered at the ZIP code level. <u>Sources:</u> Expert Commitee for Property Values in Berlin; Lehmann and Wikman (2025); authors' calculations. \*\*\* p < 0.01; \*\* p < 0.05; \* p < 0.1

during expansions (-38.6%).<sup>22</sup> The additional recession-specific foreclosure discount generally moved in tandem between East and West Berlin, with the discounts in East Berlin – as already shown in our analysis of yearly discounts – a bit higher than those of West Berlin.<sup>23</sup> The key takeaway from this regional business cycle analysis is twofold: First, recessionary periods tend to correlate with higher foreclosure discounts, though these vary within parts of Berlin. Second, the impact of recessions on the foreclosure market is not uniform; it depends on the specific economic downturn and whether its causes are linked to the housing market.

<sup>&</sup>lt;sup>22</sup>In Germany, this period is coined as the "stagnation crisis of 2001", triggered by a sharp slowdown in U.S. growth (Grömling 2025; Deutsche Bundesbank 2001).

<sup>&</sup>lt;sup>23</sup>The lack of data on foreclosures in East Berlin before 1998 prohibits us to estimate the effect of the 1995 Q3 to 1997 Q3 recession on East Berlin's foreclosure discounts. However, in this recession, one could expect that East Berlin's foreclosure discount behaved somewhat differently than that of West Berlin, reflecting the spatially different post-reunification boom's impact on construction and subsequent price corrections within Berlin.

#### 5.2. Foreclosure Effects on Appreciation Rates

While foreclosure transactions are associated with lower prices compared to regular sales (controlling for observable characteristics), it remains unclear whether these discounts translate into different appreciation rates – and thus housing returns – between distressed and non-distressed properties. This section examines how these price differentials affect appreciation rates, with a focus on potential variations by holding period, investor type, and the winning bid in the foreclosure auction.

*General effect.* Table 5 presents the results from our nearest neighbor matched sample of repeat sales. The findings align with our expectations: (i) apartments acquired through foreclosure and subsequently sold on the open market exhibit significantly higher appreciation rates, while (ii) apartments initially transacted on the open market and later sold through foreclosure experience significantly lower appreciation rates compared to the control group.

As shown in column 1, the control group (non-foreclosure repeat sales) achieves an annualized appreciation of 8.4%. For Treatment 1 (foreclosure followed by a regular sale), the average markup is 22.6 percentage points, resulting in an annualized appreciation of 31.0%. By contrast, Treatment 2 (regular sale followed by foreclosure) incurs an average markdown of 17 percentage points, leading to a negative appreciation of -8.6%.

To account for heterogeneity in apartment prices across zip codes, years, and market phases, we include various fixed effects in our regressions. Across all specifications, the treatment dummies remain highly significant. In our most stringent specification (column 4), Treatment 1 apartments generate an excess return of 20.5 percentage points, while Treatment 2 apartments experience a markdown of 9.6 percentage points relative to the control group.

To ensure robustness, we implement alternative matching strategies that retain a larger pool of control observations. These additional results, reported in Appendix Table A6, confirm the robustness of our main findings.

*Conditional on holding period.* To explore how the effect of foreclosure on appreciation rates varies with the holding period, we modify Equation 3 as follows:

|                                                          | Dep. Var.: Annualized appreciation rate |                |                |                |  |
|----------------------------------------------------------|-----------------------------------------|----------------|----------------|----------------|--|
|                                                          | (1)                                     | (2)            | (3)            | (4)            |  |
| Constant                                                 | 0.084***                                |                |                |                |  |
|                                                          | (0.003)                                 |                |                |                |  |
| Treatment 1 (Foreclosure:Regular)                        | 0.226***                                | 0.199***       | 0.171***       | 0.205***       |  |
|                                                          | (0.010)                                 | (0.009)        | (0.010)        | (0.017)        |  |
| Treatment 2 (Regular:Foreclosure)                        | $-0.170^{***}$                          | $-0.144^{***}$ | $-0.086^{***}$ | $-0.096^{***}$ |  |
|                                                          | (0.005)                                 | (0.005)        | (0.004)        | (0.007)        |  |
| ZIP code FE                                              |                                         | $\checkmark$   | $\checkmark$   | $\checkmark$   |  |
| Y first sale FE                                          |                                         | $\checkmark$   | $\checkmark$   | $\checkmark$   |  |
| Y second sale FE                                         |                                         | $\checkmark$   | $\checkmark$   | $\checkmark$   |  |
| Y first sale $	imes$ Y first second FE                   |                                         |                | $\checkmark$   | $\checkmark$   |  |
| ZIP code $\times$ Y first sale FE                        |                                         |                | $\checkmark$   | $\checkmark$   |  |
| ZIP code $	imes$ Y second sale FE                        |                                         |                | $\checkmark$   | $\checkmark$   |  |
| ZIP code $\times$ Y first sale $\times$ Y second sale FE |                                         |                |                | $\checkmark$   |  |
| Num. obs.                                                | 20,408                                  | 20,408         | 20,408         | 20,408         |  |
| R <sup>2</sup>                                           | 0.210                                   | 0.308          | 0.661          | 0.816          |  |

#### TABLE 5. Results for Matched Sample

OLS regressions with the annualized holding period return as the response variable. Standard errors are clustered at the ZIP code level. <u>Sources:</u> Expert Commitee for Property Values in Berlin; authors' calculations. \*\*\* p < 0.01; \*\* p < 0.05; \* p < 0.1

$$\begin{split} y_{ip} &= \alpha + \sum_{b=2}^{11} \beta_0^b \operatorname{Hold}_{ip} + \sum_{b=1}^{11} \beta_1^b \operatorname{Hold}_{ip} \times T1_i \\ &+ \sum_{b=1}^{11} \beta_2^b \operatorname{Hold}_{ip} \times T2_i + \epsilon_{ip} \,. \end{split}$$

(5)

Here,  $y_{ip}$  represents the annualized appreciation rate of repeat sale *i* with holding period *p*. Hold<sub>*ip*</sub> is an indicator variable for holding period bins, ranging from up to one year (*b* = 1) to more than ten years (*b* = 11). The bin "up to one year" is omitted to avoid perfect collinearity. This specification allows us to assess how the foreclosure effect on returns evolves across different holding periods.

Table A2 (in the appendix) provides the full regression results. To simplify interpretation, we re-estimate the model without the constant term and include all holding period bins (b = 1 through b = 11), allowing us to directly observe annualized appreciation rates for each group. Figure 9 and Table 6 summarize the key findings. Investments in foreclosed apartments consistently outperform the control group across all holding periods, although annualized appreciation rates decline as the holding period increases, reflecting the technical effect of annualization.<sup>24</sup> Despite this decline, average appreciation remain similar across holding periods.<sup>25</sup>

"Flipping" a distressed apartment within one year yields an average appreciation of 62.1%, more than double the 30.5% appreciation for comparable non-distressed apartments. Since we implicitly control for observable characteristics in repeat sales and it is unlikely that unobserved factors (e.g., changes in locational amenities) shift significantly within a one-year period, this suggests that the large discount for foreclosed properties is unrelated to housing quality.<sup>26</sup>

For Treatment 2 apartments – those foreclosed after a regular sale – appreciation rates are consistently lower than those of the control group across all holding periods, with negative appreciation in absolute terms. This indicates that delinquent owners not only underperform relative to the market but also incur outright financial losses.

*Conditional on Auction Price.* As outlined in Section 2, courts set minimum bids for foreclosure auctions, requiring bids to reach at least 50% of the appraised market value on the first auction date. This institutional feature suggests that courts' determination of acceptable bids is influenced by prevailing market conditions. To examine the relationship between winning bids and subsequent appreciation rates, we focus on all Treatment 1 repeat sales and group them into deciles based on the auction price (i.e., the transaction price of the first sale). This approach allows us to analyze how appreciation rates vary across auction price levels while mitigating concerns about extreme values and poorly matched observations.

We estimate the following variation of Equation 3:

(6) 
$$y_{jb} = \alpha + \sum_{d=2}^{10} \beta^d \operatorname{Bid}_{jb} + \epsilon_{jb}$$

<sup>&</sup>lt;sup>24</sup>Annualization reduces comparability across holding periods because it compresses returns over longer time horizons.

<sup>&</sup>lt;sup>25</sup>The mean holding period for each bin is approximately the midpoint of the interval, except for the ">10 years" bin, where the mean holding period is 15 years.

<sup>&</sup>lt;sup>26</sup>This finding is consistent with LaCour-Little and Yang (2023), who also report that flip sales outperform non-flip sales, particularly for distressed properties.



FIGURE 9. Results by holding period

This figure shows the annualized returns for the Control, Treatment 1, and Treatment 2 group along with 95% confidence intervals of the estimated coefficients. <u>Sources:</u> Expert Commitee for Property Values in Berlin; authors' calculations.

Here,  $y_{jb}$  represents the annualized appreciation rate of Treatment 1 repeat sale j, with b denoting the winning bid in the foreclosure auction. Bid is an indicator variable for auction price deciles d = 2 to d = 10, with the lowest decile (D1) serving as the reference category. This model evaluates how appreciation rates vary with the auction price, providing insight into how the initial purchase price affects subsequent appreciation.

Full estimation results are provided in Appendix Table A3. For illustration, Figure 10 presents boxplots of annualized appreciation rates by auction price deciles. Each box displays the mean appreciation rate for the respective decile, while asterisks indicate the statistical significance of a Welch t-test comparing the mean appreciation rate of each decile to that of the first decile (D1).

Our analysis reveals that properties in the lowest decile of winning bids (D1) achieve the highest mean annualized appreciation rate of 38.5%. In contrast, more expensive foreclosures tend to exhibit lower appreciation rates. For example, properties in the highest decile (D10) show a significantly lower mean appreciation rate of 16.8%, along with the largest variation in returns, including downside risk to negative appreciation. Notably, appreciation rates do not decrease monotonically with the auction price. For

|                       |               |       |              | He    | olding p | eriod in     | years       |      |             |             |             |
|-----------------------|---------------|-------|--------------|-------|----------|--------------|-------------|------|-------------|-------------|-------------|
|                       | ≦1            | >1-2  | >2-3         | >3-4  | >4-5     | >5-6         | >6-7        | >7-8 | >8-9        | >9-10       | >10         |
| Control               | 30.5          | 21.7  | 12.3         | 6.2   | 4.1      | 2.6          | 1.3         | 0.5* | 0.5*        | 0.1*        | 1.6         |
| SE                    | 1.3           | 1.9   | 1.0          | 0.7   | 0.5      | 0.4          | 0.5         | 0.4  | 0.4         | 0.4         | 0.2         |
| n                     | 1,499         | 736   | 683          | 668   | 711      | 697          | 622         | 525  | 478         | 379         | 3,206       |
| Treatment 1           | 62.1          | 42.0  | 26.4         | 18.5  | 14.0     | 12.6         | 10.0        | 11.2 | 9.4         | 9.8         | 8.9         |
| SE                    | 2.2           | 1.7   | 1.2          | 1.1   | 1.4      | 1.0          | 0.9         | 0.9  | 0.9         | 0.7         | 0.3         |
| $\Delta$ Control (PP) | 31.6          | 20.3  | 14.1         | 12.3  | 9.9      | 10.0         | 8.7         | 10.7 | 8.9         | 9.8         | 7.3         |
| n                     | 1,415         | 551   | 344          | 272   | 231      | 199          | 151         | 141  | 102         | 100         | 1,239       |
| Treatment 2           | - <b>20.6</b> | -12.3 | <b>-21.8</b> | -15.0 | -13.5    | <b>-10.2</b> | <b>-8.5</b> | -7.7 | <b>-7.0</b> | <b>-4.9</b> | <b>-2.6</b> |
| SE                    | 6.5           | 3.3   | 1.7          | 1.1   | 0.6      | 0.7          | 0.5         | 0.5  | 0.6         | 0.4         | 0.2         |
| $\Delta$ Control (PP) | -51.1         | -34.0 | -34.1        | -21.2 | -17.6    | -12.8        | -9.8        | -8.2 | -7.5        | -5.0        | -4.2        |
| n                     | 71            | 117   | 324          | 459   | 612      | 579          | 531         | 428  | 356         | 312         | 1,670       |

TABLE 6. Annualized appreciation rate by group and holding period

This table shows annualized holding period returns by group and holding period bin. Bold numbers are annualized returns in percent. Rows denoted with "n" show the number of repeat sales in each group-category combination, while "SE" indicates the standard error of the estimated coefficient. " $\Delta$  Control (PP)" shows the "excess profit" of treatment returns over the control group in percentage points. "\*" indicates an estimated coefficient with p-value > 0.1. <u>Sources:</u> Expert Commitee for Property Values in Berlin; authors' calculations.

instance, rates in deciles D4 and D5 are statistically indistinguishable from those in  $D1.^{27}$ 

A potential critique of our analysis is that apartments may systematically differ across auction price deciles – for example, larger apartments are likely to command higher (unadjusted) auction prices. To address this concern, we extend our analysis in columns (2)–(4) of Table A3 by progressively introducing not only location and transaction-related fixed effects, but also key apartment-level controls. Specifically, we control for the log of floor space, the number of rooms, the age of the building, and the squared term of building age. The results remain robust across all specifications, indicating that the observed variation in appreciation rates is not driven by differences in apartment characteristics or location-specific factors.

These findings suggest that the later appreciation of foreclosed apartments – and thus the returns for investors – is highly sensitive to the winning auction price, particularly for more expensive foreclosures. While lower auction prices provide greater potential for higher returns, the variability in appreciation rates for higher-priced foreclosures

<sup>&</sup>lt;sup>27</sup>We point out that in our richer models described in the next paragraph, this is no longer the case. However, what remains is the non-linearity in (mean) appreciation rates by decile.





This figure shows the distribution of annualized appreciation rates of foreclosures conditional on the auction price decile. Boxplots show the usual five-number summary as well as the mean. Asterixes indicate the statistical significance of Welch t-tests comparing the mean appreciation rate of properties in the respective auction price decile to that of the first decile. <u>Sources:</u> Expert Commitee for Property Values in Berlin; authors' calculations.

indicates increased downside risk, underscoring the importance of initial purchases price in shaping investor outcomes.

*Conditional on Investor Type.* An important question is whether foreclosures yield different appreciation rates depending on the type of buyer or investor. Corporations, leveraging their expertise and institutional knowledge, might achieve higher returns on foreclosed properties compared to private investors. To test this hypothesis, we regress the annualized appreciation rate on an investor type dummy variable, using only Treatment 1 observations. The results, presented in Table A4 (columns (1)–(4)), indicate that private investors experience approximately 10 percentage points lower annual appreciation compared to corporate investors.

To ensure that this difference is not driven by differences in property characteristics – such as corporations systematically acquiring newer or higher-quality apartments – we repeat the analysis on a matched sample of Treatment 1 observations.<sup>28</sup> Using this

<sup>&</sup>lt;sup>28</sup>We apply the matching procedure outlined in Section 4.2, matching private investor Treatment 1

matched sample, the results in Table A4 (columns (6)–(8)) confirm that private investors' properties exhibit annualized appreciation rates approximately 10–12 percentage points lower than those of corporate investors.<sup>29</sup>

These findings suggest that corporations benefit from superior institutional knowledge and expertise, enabling them to generate higher returns on foreclosed properties. This advantage may stem from corporations' ability to purchase properties at lower prices, as suggested by Allen et al. (2018), or to sell them at higher prices in the regular market. The results highlight the role of investor sophistication in distressed property markets, where institutional buyers may exploit informational or procedural advantages to secure more favorable outcomes.

*Temporary vs. Permanent Effect.* While Table 5 demonstrates that repeat sales in the Treatment 2 arm appreciate 9.6 to 17 percentage points *less* than comparable non-distressed sales, it remains unclear whether this foreclosure discount is temporary – affecting only the foreclosure transaction – or permanent, resulting in persistently lower appreciation rates for the property.

To assess the persistence of foreclosure discounts, we analyze apartments transacted multiple times, with one foreclosure occurring between two regular sales (recall our setup depicted in Figure 5). From our dataset, we isolate 2,239 apartments with this transaction sequence and compute "hypothetical" appreciation rates with the transactions before and after the foreclosure, excluding the foreclosure sale itself. Using our matching algorithm (see Section 4.2), we match these "treated" repeat sales to comparable non-distressed repeat sales, yielding a sample of 4,478 repeat sales. Post-matching, the mean differences in matching variables between treated and control groups are statistically non-significant (p-values > 0.1), ensuring comparability.

Table 7 presents the results. Non-distressed "double" repeat sales in this sample exhibit an average annual appreciation rate of 1.9%. For apartments that experienced a foreclosure between two regular sales, the annualized appreciation rate is reduced by 2 percentage points compared to the control group, suggesting a potential stigma effect. However, after controlling for zip code and transaction year fixed effects, this difference decreases to 1.8 percentage points. When further controlling for time-variant

observations with those of corporations based on building age, number of rooms, floor space, date of second transaction, and zip code. This procedure yields a 1:1 matched sample of 2,390 observations.

<sup>&</sup>lt;sup>29</sup>As we argued in Section 3, a not inconsiderable number of these private investors might in fact be corporate investors. This "fuzzy" assignment to investor type would result in our estimated appreciation rate difference being a lower bound, with the true rate increasing with the true number of private investors in the group "private investor".

|                                                          | Dep. Var.: Annualized appreciation rate |                |              |              |  |  |
|----------------------------------------------------------|-----------------------------------------|----------------|--------------|--------------|--|--|
|                                                          | (1)                                     | (2)            | (3)          | (4)          |  |  |
| Constant                                                 | 0.019***                                |                |              |              |  |  |
|                                                          | (0.003)                                 |                |              |              |  |  |
| Treatment (foreclosed in between)                        | $-0.020^{***}$                          | $-0.018^{***}$ | 0.001        | 0.000        |  |  |
|                                                          | (0.003)                                 | (0.003)        | (0.004)      | (0.004)      |  |  |
| ZIP code FE                                              |                                         | $\checkmark$   | $\checkmark$ | $\checkmark$ |  |  |
| Y first sale FE                                          |                                         | $\checkmark$   | $\checkmark$ | $\checkmark$ |  |  |
| Y second sale FE                                         |                                         | $\checkmark$   | $\checkmark$ | $\checkmark$ |  |  |
| Y first sale $	imes$ Y first second FE                   |                                         |                | $\checkmark$ | $\checkmark$ |  |  |
| ZIP code $	imes$ Y first sale FE                         |                                         |                | $\checkmark$ | $\checkmark$ |  |  |
| ZIP code $\times$ Y second sale FE                       |                                         |                | $\checkmark$ | $\checkmark$ |  |  |
| ZIP code $\times$ Y first sale $\times$ Y second sale FE |                                         |                |              | $\checkmark$ |  |  |
| Num. obs.                                                | 4,478                                   | 4,478          | 4,478        | 4,478        |  |  |
| R <sup>2</sup>                                           | 0.007                                   | 0.247          | 0.963        | 0.974        |  |  |

### TABLE 7. Results for permanence of effects

OLS regressions with the annualized appreciation rate as the response variable. Standard errors are clustered at the ZIP code level. <u>Sources:</u> Expert Committee for Property Values in Berlin; authors' calculations. \*\*\* p < 0.01; \*\* p < 0.05; \* p < 0.1

heterogeneity across zip codes (columns (3) and (4)), the coefficient becomes statistically insignificant. These results suggest that, after accounting for temporal and spatial factors, foreclosures do not impose a lasting stigma on properties. Instead, the observed discount appears to be limited to the foreclosure transaction itself.

#### 5.3. Synthesis, Robustness, and Situating in the literature

*Alignment.* In this section, we synthesize the results from our two empirical approaches. While the hedonic models estimate price differentials between distressed and non-distressed properties, and the repeat sales models measure price appreciation, both approaches yield consistent qualitative conclusions: foreclosed properties are sold at a discount and exhibit distinct price appreciation trajectories compared to non-foreclosed properties. These dynamics translate into profits for buyers and investors, while imposing losses on distressed homeowners, relative to comparable non-foreclosed properties.

To reconcile the different samples used in both approaches, we re-estimated our hedonic models (Equations 1 and 2) using only the 36,808 transactions from our repeat

sales sample, which comprises 20,408 transaction pairs.<sup>30</sup>

Based on our estimates in Table A1, the static foreclosure discount in this matched sample is 37%, slightly lower than the full-sample estimate of 39%. The dynamic foreclosure discount exhibits similar trends, with a Spearman correlation of 0.97 between the two time series. This strong correlation confirms the robustness of our findings and suggests that the conclusions drawn from the full sample hold even when restricted to the repeat sales sample.

*Contrast.* To situate our findings within the existing literature, we compare our results with four studies that are most similar in focus and methodology:

- (a) Comparison with Just et al. (2019): This study, to our knowledge the only other analysis of foreclosure discounts in Germany, estimates a discount of 19–25.5% using data from 2008–2011. Despite methodological differences – they use asking prices from real estate advertisements as counterfactual transaction prices – their findings support our conclusion of substantial foreclosure discounts within the same institutional setting.
- (b) Comparison with Pennington-Cross (2006): This U.S. study employs a repeat sales approach to estimate that distressed repeat sales (analogous to our "Treatment 2") appreciate 22% less than the area average. While their analysis does not control for property or neighborhood characteristics, their results align closely with our estimates of 8.6 to 15.6 percentage points less appreciation, derived from a more robust matched sample of repeat sales.
- (c) Comparison with Harding, Rosenblatt, and Yao (2012): This U.S. study examines appreciation rates for properties in Treatment 1 and finds no excess returns for distressed properties except for "flipped" properties (holding periods of less than one year), which exhibit excess returns of 33.2%. Their results are consistent with our findings for short-term flips, but their sample is much smaller (868 repeat sales pairs compared to our 4,745 distressed repeat sales). Additionally, they report higher associated risks for short-term flips, which we do not observe in our data.

<sup>&</sup>lt;sup>30</sup>The repeat sales sample includes 36,808 transactions rather than 40,816 unique transactions due to some transactions being involved in both Treatment 1 and Treatment 2. For example, consider an apartment *i* with three transactions on dates  $r_1$ , f, and  $r_2$ , where  $r_1$  and  $r_2$  are regular sales and f is a foreclosure ( $r_2 > f > r_1$ ). In this case, the pair ( $r_1$ , f) constitutes a Treatment 2 observation, while (f,  $r_2$ ) forms a Treatment 1 observation. Thus, what appears as two separate repeat sales involves only three distinct transactions.

(d) Comparison with Donner (2017): This study, conducted in Stockholm, Sweden, uses a similar methodology to ours and finds that Treatment 1 properties generate annualized appreciation rates 37.8 to 48.6 percentage points higher than non-distressed properties, while Treatment 2 properties show appreciation rates 7.6 to 10.7 percentage points lower. Our results of 17.1 to 22.6 percentage points higher annualized appreciation for Treatment 1, and 8.2 to 17 percentage points lower annualized appreciation for Treatment 2 are qualitatively consistent, though the estimates of Donner (2017) suggest a larger markup for Treatment 1. This discrepancy may stem from differences in holding periods: we observe an average holding period of 5.8 years for Treatment 1 and 8.4 years for Treatment 2, while Donner (2017) reports 4.3 years and 1.2 years, respectively. Given that holding periods influence annualized returns, these differences are expected.

# 6. Discussion and Limitations

Having established significant foreclosure discounts and excess returns for buyers of foreclosed apartments in Berlin, we now discuss potential mechanisms underlying these price differentials and the limitations of our analysis.

*Auction format.* The literature typically attributes foreclosure discounts to the "proxy effect" (lower property quality) and the "stigma effect" (negative perception). After controlling for property characteristics, much of the discount could be attributed to stigma. However, we propose that the auction format in Germany also plays a critical role in driving these discounts.<sup>31</sup>

We hypothesize that the German foreclosure auction system creates a paradox of transparency: too little transparency from an outside perspective and too much transparency from an insider's perspective. Auction theory suggests that a larger pool of bidders increases the likelihood of higher bids (e.g., Bulow and Klemperer 1996; Mazzola 2024). Barriers such as weekday timing, physical presence requirements, and the inability to inspect properties limit the pool of bidders, often leaving specialized investors as the primary participants. Additionally, the ascending auction format may facilitate collusion among frequent participants, who can form bidding rings to suppress

<sup>&</sup>lt;sup>31</sup>In the U.S., Mian, Sufi, and Trebbi (2015) and Cordell and Lambie-Hanson (2016) find that judicial foreclosure processes result in larger discounts. However, on the contrary, the likelihood of foreclosures seems to be lower than in nonjudicial foreclosure process systems (Bakker 2023).

prices (Klemperer 2002a; Pagnozzi 2011; Marshall, Marx, and Meurer 2014; Lorentziadis 2016).

Unfortunately, our dataset lacks information on auction dynamics, such as the number of bidders or bid sequences, which could provide deeper insights into the role of auction design. Future research could address this limitation by accessing court records of auction processes.

*Transaction costs.* Our return estimates are based on transaction prices and do not account for transaction costs, meaning they represent upper bounds of true returns. However, most transaction costs – such as taxes and notary fees – apply equally to foreclosed and non-foreclosed properties. Even after accounting for court fees, the excess returns for foreclosed apartments (Treatment 1) remain significantly higher than those of non-distressed properties.

*Debt financing*. Our analysis assumes properties are financed entirely with equity. In practice, debt financing can amplify returns for buyers (Treatment 1) and mitigate losses for distressed sellers (Treatment 2). High-leverage mortgages are closely associated with foreclosure risk (Corbae and Quintin 2015), suggesting that – at least for Treatment 2 sellers – the estimated (negative) returns could represent upper bounds.

However, it is important to note that Corbae and Quintin (2015) focus exclusively on the U.S. housing market, where institutional features differ significantly from Germany. For example, U.S. mortgages often allow for lower down payments, which is usually not the case in Germany. This means that the strong correlation of high-leverage financing and foreclosure risk observed in the U.S. could be weaker in Germany. Still, abstracting from the association of (the level of) debt financing on (the probability of) foreclosure, the return on equity in Treatment 1 apartments increases, while the equity losses in Treatment 2 apartments decrease with the proportion of debt financing.

*Risk premium.* We do not explicitly account for the risk profiles of foreclosed properties. The higher returns observed for Treatment 1 apartments may reflect compensation for ex-ante risks, such as the inability to inspect the property prior to auction. For example, some of the 1,415 apartments in the Treatment 1 regime resold within one year of foreclosure likely had risks associated with them that did not materialize, resulting in higher realized returns. Fear of poor property condition, which may have suppressed

auction prices, may not have been justified in these cases.<sup>32</sup>

*"Fire sales".* Negative returns for Treatment 2 transactions across all holding periods may reflect the selling pressure and shorter time on the market typically associated with distressed sales (Clauretie and Daneshvary 2009, 2011; Shilling, Benjamin, and Sirmans 1990; Springer 1996; Aroul and Hansz 2014; Goodwin and Johnson 2017).<sup>33</sup> However, in Germany's institutional setting, courts oversee the foreclosure process and set minimum bids, making it unlikely that time-on-market or selling pressure drives the observed foreclosure discounts.

*Unobserved changes and omitted variable bias.* Although we ensure consistency in apartment characteristics between repeat-sale transactions, we cannot rule out unobserved changes, such as minor renovations or neighborhood improvements, that could affect our results. While our models control for time-varying factors at the zip code level using fixed effects, more granular changes (e.g., a new building affecting the view) could introduce omitted variable bias.

*Spillover effects and SUTVA*. Foreclosures can have spillover effects on neighboring properties, lowering prices through physical neglect or increased housing supply (e.g., Immergluck and Smith 2006; Lin, Rosenblatt, and Yao 2009; Harding, Rosenblatt, and Yao 2009; Hartley 2014; Anenberg and Kung 2014; Fisher, Lambie-Hanson, and Willen 2015; Lambie-Hanson 2015; Bak and Hewings 2019; Biswas, Fout, and Pennington-Cross 2023).<sup>34</sup> Such spillover effects could bias the prices and returns of our control group downward, violating the Stable Unit Treatment Value Assumption (SUTVA).

However, dis-amenity effects are likely less pronounced for apartments in multifamily buildings, where physical neglect is less visible from the street. Nonetheless, spillover effects within the same building (e.g., odors) may still contribute to price discounts, as noted by Fisher, Lambie-Hanson, and Willen (2015). Additionally, the increased supply from foreclosures could depress prices for non-distressed properties,

<sup>&</sup>lt;sup>32</sup>For complementary research on price uncertainty in Berlin's housing market, see Amaral (2024), who finds that properties with higher price uncertainty trade at lower prices but yield higher total returns, suggesting a potential connection between market liquidity, uncertainty, and price discounts.

<sup>&</sup>lt;sup>33</sup>In contrast, Allen et al. (2024) find that foreclosures in the U.S. often spend more time on the market than regular transactions. They attribute this contradicting evidence to improved measures of time-on-market in their analysis.

<sup>&</sup>lt;sup>34</sup>Another strand of literature examines the "contagion effect," where foreclosures increase the probability of neighboring properties being foreclosed as well (see, e.g., Towe and Lawley 2013; Chan et al. 2013).

potentially leading us to underestimate the return differences between foreclosed and non-foreclosed apartments.

## 7. Conclusion

This paper provides new evidence on foreclosure discounts and their relationship to property appreciation rates in the Berlin housing market from 1984 to 2022. Using comprehensive transaction-level data, we document substantial foreclosure discounts that vary over time, ranging from approximately 50% prior to the 2008/2009 financial crisis to 20% in recent years. These discounts are markedly larger than those observed in other housing markets, highlighting Berlin's unique institutional and economic characteristics.

Our findings confirm that foreclosure discounts are tightly connected to the regional business cycle, with discounts generally increasing during recessionary periods, though not uniformly across all economic downturns. We also identify modest but persistent differences between East and West Berlin, with slightly larger discounts observed in East Berlin, likely reflecting its post-reunification legacy of overinvestment and slower economic growth.

The repeat sales analysis reveals distinct appreciation patterns for foreclosed properties. Apartments acquired through foreclosure and subsequently sold in regular transactions exhibit annualized appreciation rates 20.5 percentage points higher than matched non-distressed properties, demonstrating the significant excess returns available to foreclosure investors. This effect is particularly pronounced for short holding periods, with "flips" achieving annualized returns exceeding 60%. Conversely, properties initially purchased in regular transactions but later auctioned off through foreclosure proceedings experience appreciation rates 9.6 percentage points lower than matched non-distressed properties, reflecting the financial losses incurred by distressed homeowners.

Importantly, our analysis of apartments with multiple transactions reveals that foreclosure effects are primarily transaction-specific rather than permanent. After controlling for temporal and spatial factors, previously foreclosed properties do not exhibit significantly lower appreciation rates in subsequent regular transactions, suggesting that foreclosure discounts do not persist as a long-term stigma on the property itself.

Several mechanisms may contribute to these foreclosure discounts, including the German judicial auction format, which potentially limits bidder participation and facilitates collusion among specialized investors. Corporate investors, leveraging institutional knowledge and expertise, achieve approximately 10 percentage points higher annual appreciation on foreclosed properties compared to private investors, underscoring the role of buyer sophistication in distressed property markets.

These findings have important implications for housing policy and auction design. The significant discounts observed in foreclosure auctions suggest that the current institutional framework may not maximize recovery values for creditors or residual funds for distressed homeowners. Reforms aimed at increasing bidder participation, such as introducing electronic auctions, could enhance transparency and reduce foreclosure discounts.<sup>35</sup> Additionally, modifications to the auction format – such as requiring "round" bids to prevent signaling, implementing anonymous bidding, or transitioning to sealed-bid auctions – could mitigate collusion and foster greater competition (Klemperer 2002b). A sealed-bid auction format, where all bids are submitted simultaneously, would discourage tacit collusion and attract more entrants.<sup>36</sup>

For market participants, our results highlight the substantial profit opportunities available to investors in foreclosed properties, particularly for those with specialized knowledge and institutional resources. However, these opportunities come with risks that may not be fully captured in our analysis, including potential renovation needs or undisclosed property defects.

Future research could extend this work in several directions. First, accessing court records of auction processes would provide deeper insights into auction dynamics, including the number of bidders, bid sequences, potential collusion among participants, or different dynamics between the first and, if mandatory minimum bids are not met, second auction round. Second, incorporating data on property condition before and after foreclosure would help disentangle quality-related discounts from those stemming from institutional factors or market dynamics. Finally, exploring the spillover effects of foreclosures on neighboring properties within multi-family buildings would enhance our understanding of how distressed sales affect broader housing market stability.

In conclusion, this study contributes to our understanding of foreclosure discounts and their economic implications by providing evidence from an understudied housing market with distinct institutional features. The substantial and persistent discounts observed in Berlin highlight the importance of market design in shaping distressed property outcomes and suggest opportunities for policy interventions to improve efficiency

<sup>&</sup>lt;sup>35</sup>Mazzola (2024) suggests that the introduction of electronic foreclosure auctions in Florida increased the success probability of auctions by 39% while foreclosure discounts shrank by 53%.

<sup>&</sup>lt;sup>36</sup>An alternative auction format to consider is the "Anglo-Dutch" auction, which combines features of ascending and descending auctions (Klemperer 1998).

and equity in foreclosure processes.

# References

- Allen, Marcus T., Justin D. Benefield, Christopher L. Cain, and Norman Maynard. 2024. "Distressed Property Sales: Differences and Similarities Across Types of Distress." *The Journal of Real Estate Finance and Economics* 68 (2): 318–353.
- Allen, Marcus T., Jessica Rutherford, Ronald Rutherford, and Abdullah Yavas. 2018. "Impact of Investors in Distressed Housing Markets." *The Journal of Real Estate Finance and Economics* 56 (4): 622–652.
- Amaral, Francisco. 2024. "Price Uncertainty and Returns to Housing."
- Anenberg, Elliot, and Edward Kung. 2014. "Estimates of the Size and Source of Price Declines Due to Nearby Foreclosures." *American Economic Review* 104 (8): 2527–2551.
- Aroul, Ramya Rajajagadeesan, and J. Andrew Hansz. 2014. "The Valuation Impact on Distressed Residential Transactions: Anatomy of a Housing Price Bubble." *The Journal of Real Estate Finance and Economics* 49 (2): 277–302.
- Ashenfelter, Orley, and David Genesove. 1992. "Testing for Price Anomalies in Real-Estate Auctions." *The American Economic Review* 82 (2): 501–505.
- Bak, Xian F., and Geoffrey J. D. Hewings. 2019. "The Heterogeneous Spatial Impact of Foreclosures on Nearby Property Values." *The Annals of Regional Science* 62 (3): 439–466.
- Bakker, Trevor J. 2023. "Household Spatial Effects of Foreclosure Process."
- Biswas, Arnab, Hamilton Fout, and Anthony Pennington-Cross. 2023. "Mortgage Losses under Alternative Property Disposition Approaches: Deed-in-Lieu, Short Sales, and Foreclosure Sales." *The Journal of Real Estate Finance and Economics* 66 (3): 603–635.
- Bry, Gerhard, and Charlotte Boschan. 1971. Cyclical Analysis of Time Series: Selected Procedures and Computer Programs.: NBER.
- Bulow, Jeremy, and Paul Klemperer. 1996. "Auctions Versus Negotiations." *The American Economic Review* 86 (1): 180–194.
- Campbell, John Y, Stefano Giglio, and Parag Pathak. 2011. "Forced Sales and House Prices." *American Economic Review* 101 (5): 2108–2131.
- Carroll, Thomas, Terrence Clauretie, and Helen Neill. 1997. "Effect of Foreclosure Status on Residential Selling Price: Comment." *Journal of Real Estate Research* 13 (1): 95–102.
- Chan, Sewin, Michael Gedal, Vicki Been, and Andrew Haughwout. 2013. "The Role of Neighborhood Characteristics in Mortgage Default Risk: Evidence from New York City." *Journal of Housing Economics* 22 (2): 100–118.
- Chang, Yan, and Xiaoming Li. 2014. "Distressed Home Sales: Temporary Discount or Permanent Devaluation."
- Chow, Yuen Leng, Isa E. Hafalir, and Abdullah Yavas. 2015. "Auction versus Negotiated Sale: Evidence from Real Estate Sales." *Real Estate Economics* 43 (2): 432–470.
- Clauretie, Terrence M., and Nasser Daneshvary. 2009. "Estimating the House Foreclosure Discount Corrected for Spatial Price Interdependence and Endogeneity of Marketing Time." *Real Estate Economics* 37 (1): 43–67.

- Clauretie, Terrence M., and Nasser Daneshvary. 2011. "The Optimal Choice for Lenders Facing Defaults: Short Sale, Foreclose, or REO." *The Journal of Real Estate Finance and Economics* 42 (4): 504–521.
- Conklin, James N., N. Edward Coulson, and Moussa Diop. 2023. "Distressed Comps." *Real Estate Economics* 51 (1): 170–195.
- Corbae, Dean, and Erwan Quintin. 2015. "Leverage and the Foreclosure Crisis." *Journal of Political Economy* 123 (1): 1–65.
- Cordell, Larry, and Lauren Lambie-Hanson. 2016. "A Cost-Benefit Analysis of Judicial Foreclosure Delay and a Preliminary Look at New Mortgage Servicing Rules." *Journal of Economics and Business* 84: 30–49.
- Currie, Janet, and Erdal Tekin. 2015. "Is There a Link between Foreclosure and Health?" *American Economic Journal: Economic Policy* 7 (1): 63–94.
- Deutsche Bundesbank. 2001. "The Economic Scene in Germany around the Turn of 2000-01." Deutsche Bundesbank Monthly Report (February 2001).
- Diamond, Rebecca, Adam Guren, and Rose Tan. 2020. "The Effect of Foreclosures on Homeowners, Tenants, and Landlords."
- Doerner, William M., and Andrew V. Leventis. 2015. "Distressed Sales and the FHFA House Price Index." *Journal of Housing Research* 24 (2): 127–146.
- Donner, Herman. 2017. "Foreclosures, Returns, and Buyer Intentions." *Journal of Real Estate Research* 39 (2): 189–214.
- Donner, Herman, Han-Suck Song, and Mats Wilhelmsson. 2016. "Forced Sales and Their Impact on Real Estate Prices." *Journal of Housing Economics* 34: 60–68.
- Dotzour, Mark, Everard Moorhead, and Daniel Winkler. 1998. "The Impact of Auctions on Residential Sales Prices in New Zealand." *Journal of Real Estate Research* 16 (1): 57–72.
- Fisher, Lynn M., Lauren Lambie-Hanson, and Paul Willen. 2015. "The Role of Proximity in Foreclosure Externalities: Evidence from Condominiums." *American Economic Journal: Economic Policy* 7 (1): 119–140.
- Forgey, Fred A., Ronald C. Rutherford, and Michael L. VanBuskirk. 1994. "Effect of Foreclosure Status on Residential Selling Price." *The Journal of Real Estate Research* 9 (3): 313–318.
- Goldsmith-Pinkham, Paul, Peter Hull, and Michal Kolesár. 2024. "Contamination Bias in Linear Regressions." *American Economic Review* 114 (12): 4015–4051.
- Goodwin, Kimberly R., and Ken H. Johnson. 2017. "The Short Sale Stigma." *The Journal of Real Estate Finance and Economics* 55 (4): 416–434.
- Grömling, Michael. 2025. "The Current Economic Situation in Germany in the Context of Previous Crises." *Intereconomics* 60 (1): 55–59.
- Gunnelin, Ake, Rosane Hungria-Gunnelin, Bryan MacGregor, and Martin Wersing. 2023. "Empirical Insights from Swedish Real Estate Auctions."
- Gutiérrez, Aaron, and Josep-Maria Arauzo-Carod. 2018. "Spatial Analysis of Clustering of Foreclosures in the Poorest-Quality Housing Urban Areas: Evidence from Catalan Cities." *ISPRS International Journal of Geo-Information* 7 (1): 23.
- Hardin, William, and Marvin Wolverton. 1996. "The Relationship between Foreclosure Status and Apartment Price." *Journal of Real Estate Research* 12 (1): 101–109.

- Harding, Don, and Adrian Pagan. 2002. "Dissecting the Cycle: A Methodological Investigation." *Journal of Monetary Economics* 49 (2): 365–381.
- Harding, John P., Eric Rosenblatt, and Vincent W. Yao. 2009. "The Contagion Effect of Foreclosed Properties." *Journal of Urban Economics* 66 (3): 164–178.
- Harding, John P., Eric Rosenblatt, and Vincent W. Yao. 2012. "The Foreclosure Discount: Myth or Reality?" *Journal of Urban Economics* 71 (2): 204–218.
- Hartley, Daniel. 2014. "The Effect of Foreclosures on Nearby Housing Prices: Supply or Dis-Amenity?" *Regional Science and Urban Economics* 49: 108–117.
- Holtemöller, Oliver, and Rainer Schulz. 2010. "Investor Rationality and House Price Bubbles: Berlin and the German Reunification." *German Economic Review* 11 (4): 465–486.
- Imbens, Guido W., and Jeffrey M. Wooldridge. 2009. "Recent Developments in the Econometrics of Program Evaluation." *Journal of Economic Literature* 47 (1): 5–86.
- Immergluck, Dan, and Geoff Smith. 2006. "The External Costs of Foreclosure: The Impact of Single-family Mortgage Foreclosures on Property Values." *Housing Policy Debate* 17 (1): 57–79.
- Just, Tobias, and Stefanie Ebner. 2006. "US House Prices Declining: Is Europe Next?" *Deutsche Bank Research.*
- Just, Tobias, Michael Heinrich, Mark Andreas Maurin, and Thomas Schreck. 2019. "Foreclosure Discounts for German Housing Markets." *International Journal of Housing Markets and Analysis* 13 (2): 143–163.
- King, Gary, and Richard Nielsen. 2019. "Why Propensity Scores Should Not Be Used for Matching." *Political Analysis* 27 (4): 435–454.
- Klemperer, Paul. 1998. "Auctions with Almost Common Values: The 'Wallet Game' and Its Applications." *European Economic Review* 42 (3): 757–769.
- Klemperer, Paul. 2002a. "What Really Matters in Auction Design." *Journal of Economic Perspectives* 16 (1): 169–189.
- Klemperer, Paul. 2002b. "How (Not) to Run Auctions: The European 3G Telecom Auctions." *European Economic Review* 46 (4): 829–845.
- LaCour-Little, Michael, and Jing Yang. 2023. "Seeking Alpha in the Housing Market." *The Journal* of *Real Estate Finance and Economics* 67 (3): 319–374.
- Lambie-Hanson, Lauren. 2015. "When Does Delinquency Result in Neglect? Mortgage Distress and Property Maintenance." *Journal of Urban Economics* 90: 1–16.
- Lehmann, Robert, and Ida Wikman. 2025. "Quarterly GDP Estimates for the German States: New Data for Business Cycle Analyses." *Oxford Bulletin of Economics and Statistics*.
- Lin, Zhenguo, Eric Rosenblatt, and Vincent W. Yao. 2009. "Spillover Effects of Foreclosures on Neighborhood Property Values." *The Journal of Real Estate Finance and Economics* 38 (4): 387–407.
- Lorentziadis, Panos L. 2016. "Optimal Bidding in Auctions from a Game Theory Perspective." *European Journal of Operational Research* 248 (2): 347–371.
- Lusht, Kenneth M. 1996. "A Comparison of Prices Brought by English Auctions and Private Negotiations." *Real Estate Economics* 24 (4): 517–530.
- Marshall, Robert C., Leslie M. Marx, and Michael J. Meurer. 2014. "The Economics of Bidder Collusion." In *Game Theory and Business Applications*, edited by Kalyan Chatterjee and William

Samuelson, 367–397. Boston, MA: Springer US.

Mayer, Christopher J. 1995. "A Model of Negotiated Sales Applied to Real Estate Auctions." *Journal* of Urban Economics 38 (1): 1–22.

Mazzola, Francesco. 2024. "FinTech in the Courtroom: Evidence from Electronic Foreclosures."

- Mian, Atif, Amir Sufi, and Francesco Trebbi. 2015. "Foreclosures, House Prices, and the Real Economy: Foreclosures, House Prices, and the Real Economy." *The Journal of Finance* 70 (6): 2587–2634.
- Michelsen, Claus, and Dominik Weiß. 2010. "What Happened to the East German Housing Market? A Historical Perspective on the Role of Public Funding." *Post-Communist Economies* 22 (3): 387–409.
- Niedermayer, Andras, Artyom Shneyerov, and Pai Xu. 2023. "Foreclosure Auctions."
- Pagnozzi, Marco. 2011. "Bids as a Vehicle of (Mis)Information: Collusion in English Auctions with Affiliated Values." *Journal of Economics & Management Strategy* 20 (4): 1171–1196.
- Pennington-Cross, Anthony. 2006. "The Value of Foreclosed Property." *Journal of Real Estate Research* 28 (2): 193–214.
- Quan, Daniel C. 1994. "Real Estate Auctions: A Survey of Theory and Practice." *The Journal of Real Estate Finance and Economics* 9 (1): 23–49.
- Rosenbaum, Paul R. 2020. "Modern Algorithms for Matching in Observational Studies." *Annual Review of Statistics and Its Application* 7 (1): 143–176.
- Rubin, Donald B. 1977. "Assignment to Treatment Group on the Basis of a Covariate." *Journal of Educational Statistics* 2 (1): 1–26.
- Schirwitz, Beate. 2009. "A Comprehensive German Business Cycle Chronology." *Empirical Economics* 37 (2): 287–301.
- Shilling, James D., John D. Benjamin, and C. F. Sirmans. 1990. "Estimating Net Realizable Value for Distressed Real Estate." *The Journal of Real Estate Research* 5 (1): 129–140.
- Springer, Thomas M. 1996. "Single-Family Housing Transactions: Seller Motivations, Price, and Marketing Time." *The Journal of Real Estate Finance and Economics* 13 (3): 237–254.
- Towe, Charles, and Chad Lawley. 2013. "The Contagion Effect of Neighboring Foreclosures." *American Economic Journal: Economic Policy* 5 (2): 313–335.
- Voigtländer, Michael. 2014. "The Stability of the German Housing Market." *Journal of Housing and the Built Environment* 29 (4): 583–594.

|                         | De             | ep. Var.: Ln(  | Transaction p          | orice)           |
|-------------------------|----------------|----------------|------------------------|------------------|
|                         | Full sa        | mple           | Matched repe           | eat sales sample |
|                         | Static         | Dynamic        | Static                 | Dynamic          |
| Ln(Floor space)         | 1.082***       | 1.082***       | * 1.002***             | 1.005***         |
|                         | (0.008)        | (0.008)        | (0.016)                | (0.015)          |
| Number of rooms         | 0.004          | 0.003          | 0.021***               | 0.020***         |
|                         | (0.003)        | (0.003)        | (0.005)                | (0.005)          |
| Age of building         | $-0.001^{***}$ | $-0.001^{***}$ | • -0.001***            | $-0.001^{***}$   |
|                         | (0.000)        | (0.000)        | (0.000)                | (0.000)          |
| Age of building squared | 0.000***       | 0.000***       | * 0.000***             | $0.000^{***}$    |
|                         | (0.000)        | (0.000)        | (0.000)                | (0.000)          |
| Bathroom                | 0.015***       | 0.014***       | • 0.054***             | $0.051^{***}$    |
|                         | (0.005)        | (0.005)        | (0.011)                | (0.011)          |
| Separate WC             | 0.026***       | 0.025**        | * 0.015                | 0.015            |
| -                       | (0.003)        | (0.003)        | (0.010)                | (0.010)          |
| Balcony                 | 0.029***       | 0.028***       | * 0.029***             | 0.028***         |
| •                       | (0.002)        | (0.002)        | (0.005)                | (0.005)          |
| Attic                   | 0.025**        | 0.025**        | 0.094***               | 0.091***         |
|                         | (0.010)        | (0.010)        | (0.025)                | (0.024)          |
| Basement                | -0.007**       | -0.007**       | -0.011                 | -0.011           |
|                         | (0.003)        | (0.003)        | (0.007)                | (0.007)          |
| Atelier                 | -0.055         | -0.054         | 0.059                  | 0.086            |
|                         | (0.036)        | (0.036)        | (0.121)                | (0.119)          |
| Hobby room              | 0.127***       | 0.127***       | ° 0.156 <sup>***</sup> | 0.162***         |
| 5                       | (0.008)        | (0.008)        | (0.030)                | (0.030)          |
| Storage room            | $-0.021^{***}$ | -0.021***      | * _0.002               | -0.003           |
| 5                       | (0.003)        | (0.003)        | (0.006)                | (0.006)          |
| Hallway                 | -0.005         | -0.005         | 0.007                  | 0.011            |
| 5                       | (0.004)        | (0.004)        | (0.011)                | (0.011)          |
| Corridor                | -0.027***      | -0.028***      | * 0.018                | 0.020            |
|                         | (0.005)        | (0.005)        | (0.013)                | (0.013)          |
| Elevator                | 0.060***       | 0.060***       | * 0.015 <sup>*</sup>   | 0.014*           |
|                         | (0.004)        | (0.004)        | (0.008)                | (0.008)          |
| Private garage          | $-0.011^{***}$ | -0.011***      | -0.007                 | -0.006           |
| 0 0                     | (0.002)        | (0.002)        | (0.005)                | (0.005)          |
| Collective garage       | 0.023***       | 0.023***       | * 0.071***             | 0.069***         |
| 5 5                     | (0.006)        | (0.006)        | (0.021)                | (0.021)          |
| Parking lot             | 0.028***       | 0.028***       | * 0.040 <sup>***</sup> | 0.038 ***        |
| 6                       | (0.004)        | (0.004)        | (0.010)                | (0.010)          |
|                         | · /            | . ,            | · · ·                  | . ,              |

TABLE A1. Hedonic regressions for static and dynamic foreclosure discounts

Appendix A. Additional tables and figures

Type of Apartment, reference = Floor Apartment

|                                               | Full sample    |                 | Matched repe                  | eat sales sample |
|-----------------------------------------------|----------------|-----------------|-------------------------------|------------------|
|                                               | Static         | Dynamic         | Static                        | Dynamic          |
| Attic Apartment                               | 0.131***       | 0.131***        | • 0.125***                    | 0.125***         |
|                                               | (0.004)        | (0.004)         | (0.011)                       | (0.011)          |
| Duplex Apartment                              | 0.064***       | 0.063**         | * 0.052***                    | 0.050**          |
| - C                                           | (0.005)        | (0.005)         | (0.020)                       | (0.020)          |
| Loft                                          | -0.011         | -0.014          | 0.253**                       | 0.268**          |
| Devile                                        | (0.030)        | (0.029)         | (0.112)                       | (0.131)          |
| Pentnouse                                     | 0.223          | $(0.223^{+++})$ | * 0.024<br>(0.101)            | 0.031            |
| Ctouchurget Amount                            | (0.014)        | (0.014)         | (0.101)                       | (0.108)          |
| Storefront Apartment                          | -0.129         | -0.127          | -0.042                        | -0.026           |
| Torrage Apartment                             | (0.023)        | (0.023)         | (0.055 <i>)</i><br>* 0.104*** | (0.055)          |
| Terrace Apartment                             | (0.102)        | (0.104)         | (0.194)                       | (0.062)          |
|                                               | (0.019)        | (0.020)         | (0.058)                       | (0.063)          |
| Location quality, reference = Intermediate    |                |                 |                               |                  |
| Basic                                         | $-0.016^{***}$ | $-0.016^{**}$   | * -0.038***                   | $-0.040^{***}$   |
|                                               | (0.005)        | (0.005)         | (0.013)                       | (0.012)          |
| Good                                          | 0.087***       | 0.087***        | * 0.079***                    | 0.077***         |
|                                               | (0.006)        | (0.006)         | (0.014)                       | (0.014)          |
| Very good                                     | 0.298***       | 0.294**         | * 0.475***                    | 0.470***         |
|                                               | (0.024)        | (0.023)         | (0.060)                       | (0.060)          |
| Floor level, reference = Upper floors         |                |                 |                               |                  |
| Basement floor                                | -0.202***      | -0.204**        | * -0.289***                   | $-0.300^{***}$   |
|                                               | (0.014)        | (0.015)         | (0.044)                       | (0.044)          |
| First floor                                   | $-0.052^{***}$ | -0.053**        | * -0.070***                   | -0.072***        |
|                                               | (0.002)        | (0.002)         | (0.006)                       | (0.006)          |
| Mezzanine floor                               | 0.007          | 0.007           | -0.034                        | -0.032           |
|                                               | (0.008)        | (0.008)         | (0.023)                       | (0.021)          |
| Type of transaction, reference = Regular sale |                |                 |                               |                  |
| Foreclosure                                   | -0.490***      | -0.393**        | * -0.463***                   | $-0.332^{***}$   |
|                                               | (0.008)        | (0.084)         | (0.008)                       | (0.094)          |
| Foreclosure $	imes$ Year 1985                 |                | -0.074          |                               | -0.105           |
|                                               |                | (0.104)         |                               | (0.116)          |
| Foreclosure $	imes$ Year 1986                 |                | -0.126          |                               | $-0.239^{**}$    |
|                                               |                | (0.098)         |                               | (0.119)          |
| Foreclosure $\times$ Year 1987                |                | $-0.224^{**}$   |                               | -0.167           |
|                                               |                | (0.105)         |                               | (0.102)          |
| Foreclosure $\times$ Year 1988                |                | 0.007           |                               | -0.012           |
|                                               |                | (0.090)         |                               | (0.105)          |
| Foreclosure $\times$ Year 1989                |                | -0.042          |                               | -0.050           |
|                                               |                | (0.089)         |                               | (0.101)          |
| Foreclosure $\times$ Year 1990                |                | 0.113           |                               | 0.043            |
|                                               |                | (0.096)         |                               | (0.105)          |
| Foreclosure × Year 1991                       |                | 0.089           |                               | 0.026            |

|                                | Full sample |               | Matched repeat sales sampl |                |
|--------------------------------|-------------|---------------|----------------------------|----------------|
| -                              | Static      | Dynamic       | Static                     | Dynamic        |
|                                |             | (0.089)       |                            | (0.100)        |
| Foreclosure $	imes$ Year 1992  |             | 0.089         |                            | -0.029         |
|                                |             | (0.094)       |                            | (0.109)        |
| Foreclosure $	imes$ Year 1993  |             | -0.046        |                            | -0.055         |
|                                |             | (0.104)       |                            | (0.110)        |
| Foreclosure $	imes$ Year 1994  |             | -0.096        |                            | -0.070         |
|                                |             | (0.108)       |                            | (0.114)        |
| Foreclosure $	imes$ Year 1995  |             | -0.022        |                            | -0.114         |
|                                |             | (0.096)       |                            | (0.107)        |
| Foreclosure $	imes$ Year 1996  |             | 0.025         |                            | -0.111         |
|                                |             | (0.090)       |                            | (0.107)        |
| Foreclosure $	imes$ Year 1997  |             | -0.011        |                            | -0.075         |
|                                |             | (0.089)       |                            | (0.101)        |
| Foreclosure $	imes$ Year 1998  |             | $-0.175^{*}$  |                            | $-0.248^{**}$  |
|                                |             | (0.094)       |                            | (0.105)        |
| Foreclosure $	imes$ Year 1999  |             | -0.134        |                            | -0.163         |
|                                |             | (0.093)       |                            | (0.101)        |
| Foreclosure $	imes$ Year 2000  |             | $-0.253^{**}$ | *                          | $-0.300^{***}$ |
|                                |             | (0.092)       |                            | (0.101)        |
| Foreclosure $	imes$ Year 2001  |             | $-0.190^{**}$ |                            | $-0.259^{**}$  |
|                                |             | (0.093)       |                            | (0.103)        |
| Foreclosure $	imes$ Year 2002  |             | $-0.273^{**}$ | *                          | $-0.310^{***}$ |
|                                |             | (0.090)       |                            | (0.101)        |
| Foreclosure $	imes$ Year 2003  |             | $-0.309^{**}$ | *                          | $-0.371^{***}$ |
|                                |             | (0.090)       |                            | (0.100)        |
| Foreclosure $\times$ Year 2004 |             | $-0.318^{**}$ | *                          | $-0.368^{***}$ |
|                                |             | (0.089)       |                            | (0.100)        |
| Foreclosure $	imes$ Year 2005  |             | $-0.279^{**}$ | *                          | $-0.330^{***}$ |
|                                |             | (0.089)       |                            | (0.098)        |
| Foreclosure $\times$ Year 2006 |             | $-0.241^{**}$ | *                          | $-0.319^{***}$ |
|                                |             | (0.090)       |                            | (0.100)        |
| Foreclosure $\times$ Year 2007 |             | $-0.231^{**}$ | *                          | $-0.313^{***}$ |
|                                |             | (0.089)       |                            | (0.099)        |
| Foreclosure $\times$ Year 2008 |             | $-0.185^{**}$ |                            | -0.248**       |
|                                |             | (0.089)       |                            | (0.099)        |
| Foreclosure $\times$ Year 2009 |             | -0.119        |                            | $-0.191^{*}$   |
|                                |             | (0.088)       |                            | (0.099)        |
| Foreclosure $	imes$ Year 2010  |             | -0.034        |                            | -0.014         |
|                                |             | (0.087)       |                            | (0.096)        |
| Foreclosure $\times$ Year 2011 |             | 0.092         |                            | 0.076          |
|                                |             | (0.088)       |                            | (0.097)        |
| Foreclosure $\times$ Year 2012 |             | 0.156*        |                            | 0.172*         |
|                                |             | (0.088)       |                            | (0.097)        |
| Foreclosure $\times$ Year 2013 |             | 0.171**       |                            | 0.176*         |
|                                |             | (0.087)       |                            | (0.097)        |
| Foreclosure $\times$ Year 2014 |             | 0.143         |                            | $0.166^{*}$    |

|                                                    | Full s       | Full sample  |              | peat sales sample |
|----------------------------------------------------|--------------|--------------|--------------|-------------------|
|                                                    | Static       | Dynamic      | Static       | Dynamic           |
|                                                    |              | (0.088)      |              | (0.097)           |
| Foreclosure $	imes$ Year 2015                      |              | 0.193**      | k            | 0.215**           |
|                                                    |              | (0.090)      |              | (0.100)           |
| Foreclosure $	imes$ Year 2016                      |              | 0.234*       | **           | 0.240**           |
|                                                    |              | (0.089)      |              | (0.100)           |
| Foreclosure $	imes$ Year 2017                      |              | 0.235*       | **           | $0.201^{**}$      |
|                                                    |              | (0.088)      |              | (0.098)           |
| Foreclosure $	imes$ Year 2018                      |              | 0.304**      | **           | 0.247**           |
|                                                    |              | (0.093)      |              | (0.106)           |
| Foreclosure $	imes$ Year 2019                      |              | 0.193**      | k            | 0.185             |
|                                                    |              | (0.098)      |              | (0.117)           |
| Foreclosure $	imes$ Year 2020                      |              | 0.164        |              | 0.090             |
|                                                    |              | (0.109)      |              | (0.125)           |
| Foreclosure $	imes$ Year 2021                      |              | 0.216**      | k            | 0.123             |
|                                                    |              | (0.101)      |              | (0.121)           |
| Foreclosure $	imes$ Year 2022                      |              | 0.182*       |              | 0.176             |
|                                                    |              | (0.094)      |              | (0.110)           |
| $\overline{\text{ZIP code} \times \text{Year FE}}$ | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$      |
| Num. obs.                                          | 391,420      | 391,420      | 36,808       | 36,808            |
| R <sup>2</sup>                                     | 0.856        | 0.857        | 0.790        | 0.799             |

OLS regressions with the log of the transaction price as response variable. The variable "Age of building" is the actual age of the building multiplied by 10. Standard errors are clustered at the ZIP code level. Sources: Expert Commitee for Property Values in Berlin; authors' calculations. \*\*\* p < 0.01; \*\* p < 0.05; \* p < 0.1

|                                  | Dep. V                       | Dep. Var.: Annualized appreciation rate |                      |                     |  |  |
|----------------------------------|------------------------------|-----------------------------------------|----------------------|---------------------|--|--|
|                                  | (1)                          | (2)                                     | (3)                  | (4)                 |  |  |
| Constant                         | 0.305***                     |                                         |                      |                     |  |  |
|                                  | (0.013)                      |                                         |                      |                     |  |  |
| < 1 year $	imes$ Treatment 1     | 0.316***                     | 0.324***                                | $0.331^{***}$        | 0.360***            |  |  |
|                                  | (0.025)                      | (0.022)                                 | (0.029)              | (0.038)             |  |  |
| < 1 year $\times$ Treatment 2    | $-0.511^{***}$               | -0.499***                               | $-0.525^{***}$       | $-0.567^{***}$      |  |  |
|                                  | (0.066)                      | (0.067)                                 | (0.069)              | (0.114)             |  |  |
| 1–2 years                        | -0.087***                    | -0.094***                               | -0.027               | 0.011               |  |  |
|                                  | (0.022)                      | (0.022)                                 | (0.030)              | (0.040)             |  |  |
| 1–2 years $\times$ Treatment 1   | 0.203***                     | 0.197***                                | 0.203***             | 0.157***            |  |  |
|                                  | (0.024)                      | (0.023)                                 | (0.024)              | (0.040)             |  |  |
| 1–2 years $\times$ Treatment 2   | $-0.340^{***}$               | $-0.336^{***}$                          | $-0.384^{***}$       | -0.432***           |  |  |
|                                  | (0.034)                      | (0.033)                                 | (0.047)              | (0.070)             |  |  |
| 2–3 years                        | -0.181                       | -0.196                                  | $-0.076^{\circ}$     | -0.066              |  |  |
| 2. 2 maar v Traatmant 1          | (0.016)                      | (0.016)                                 | (0.033)              | (0.044)             |  |  |
| 2-3 years × meatment i           | (0.012)                      | (0.14)                                  | (0.130)              | (0.120)             |  |  |
| $2-3$ vers $\times$ Treatment 2  | (0.013)                      | (0.012)                                 | (0.010)              | (0.031)             |  |  |
| 2-5 years ~ meanment 2           | (0.019)                      | (0.016)                                 | (0.024)              | (0.034)             |  |  |
| 3-4 years                        | (0.01 <i>)</i> )<br>0 242*** | $-0.251^{***}$                          | (0.02+)<br>-0.126*** | _0.099**            |  |  |
| 5 + years                        | (0.016)                      | (0.015)                                 | (0.035)              | (0.07)              |  |  |
| $3-4$ years $\times$ Treatment 1 | 0.123***                     | 0.127***                                | 0.128***             | 0.146***            |  |  |
|                                  | (0.014)                      | (0.013)                                 | (0.016)              | (0.023)             |  |  |
| 3–4 years $\times$ Treatment 2   | $-0.212^{***}$               | -0.192***                               | $-0.163^{***}$       | -0.161***           |  |  |
| 5                                | (0.012)                      | (0.011)                                 | (0.015)              | (0.016)             |  |  |
| 4–5 years                        | -0.263***                    | -0.267***                               | -0.134***            | -0.107**            |  |  |
| •                                | (0.015)                      | (0.015)                                 | (0.039)              | (0.052)             |  |  |
| 4–5 years $\times$ Treatment 1   | 0.099***                     | 0.096***                                | 0.090***             | 0.121***            |  |  |
|                                  | (0.014)                      | (0.010)                                 | (0.017)              | (0.020)             |  |  |
| 4–5 years $	imes$ Treatment 2    | $-0.176^{***}$               | $-0.146^{***}$                          | $-0.129^{***}$       | $-0.130^{***}$      |  |  |
|                                  | (0.008)                      | (0.006)                                 | (0.010)              | (0.010)             |  |  |
| 5–6 years                        | -0.279***                    | $-0.281^{***}$                          | -0.132***            | -0.109**            |  |  |
|                                  | (0.015)                      | (0.014)                                 | (0.041)              | (0.054)             |  |  |
| 5–6 years × Treatment 1          | 0.100***                     | 0.101***                                | 0.117***             | 0.103***            |  |  |
|                                  | (0.011)                      | (0.009)                                 | (0.014)              | (0.013)             |  |  |
| $5-6$ years $\times$ Treatment 2 | $-0.128^{***}$               | $-0.103^{***}$                          | $-0.091^{***}$       | $-0.086^{***}$      |  |  |
|                                  | (0.007)                      | (0.007)                                 | (0.009)              | (0.007)             |  |  |
| 6–7 years                        | -0.292                       | -0.287                                  | -0.129               | $-0.109^{\circ}$    |  |  |
| 6 7 voora × Trootmont 1          | (0.015)                      | (0.015)                                 | (0.042)              | (0.054)             |  |  |
| 6-7 years × freatment f          | (0.087                       | (0.084)                                 | (0.072)              | (0.001)             |  |  |
| 6-7 vears × Treatment?           | 0.010)                       | (0.010)<br>0.072***                     | (0.013)              | (0.027)<br>0.057*** |  |  |
| 0-1 years × meannent 2           | -0.090<br>(0.006)            | -0.072                                  | -0.039 (0.011)       | -0.037              |  |  |
| 7-8 vears                        |                              | _0.003 <i>)</i>                         | _0.115**             | _0.000 <i>)</i>     |  |  |
| , o years                        | (0.014)                      | (0.014)                                 | (0.045)              | (0.055)             |  |  |
|                                  |                              | (0.017)                                 | (0.0 10)             | (0.000)             |  |  |

|                                                          | (1)            | (2)            | (3)            | (4)            |
|----------------------------------------------------------|----------------|----------------|----------------|----------------|
| 7–8 years $\times$ Treatment 1                           | 0.107***       | 0.092***       | 0.101***       | 0.096***       |
|                                                          | (0.010)        | (0.011)        | (0.019)        | (0.013)        |
| 7–8 years $	imes$ Treatment 2                            | -0.082***      | -0.059***      | -0.037***      | -0.050***      |
|                                                          | (0.006)        | (0.005)        | (0.010)        | (0.008)        |
| 8–9 years                                                | -0.299***      | $-0.272^{***}$ | $-0.079^{*}$   | $-0.101^{*}$   |
|                                                          | (0.014)        | (0.014)        | (0.045)        | (0.057)        |
| 8–9 years $\times$ Treatment 1                           | 0.089***       | 0.067***       | $0.061^{***}$  | 0.094***       |
|                                                          | (0.010)        | (0.007)        | (0.021)        | (0.015)        |
| 8–9 years $\times$ Treatment 2                           | -0.075***      | -0.059***      | $-0.045^{***}$ | $-0.034^{***}$ |
|                                                          | (0.006)        | (0.005)        | (0.011)        | (0.009)        |
| 9–10 years                                               | $-0.304^{***}$ | $-0.271^{***}$ | -0.070         | $-0.098^{*}$   |
| -                                                        | (0.014)        | (0.015)        | (0.045)        | (0.056)        |
| 9–10 years $\times$ Treatment 1                          | 0.098***       | 0.054***       | 0.064***       | 0.046***       |
|                                                          | (0.008)        | (0.008)        | (0.017)        | (0.014)        |
| 9–10 years $\times$ Treatment 2                          | $-0.050^{***}$ | -0.037***      | $-0.036^{***}$ | $-0.030^{***}$ |
|                                                          | (0.005)        | (0.004)        | (0.011)        | (0.007)        |
| > 10 years                                               | $-0.289^{***}$ | $-0.254^{***}$ | $-0.079^{*}$   | -0.092         |
|                                                          | (0.014)        | (0.014)        | (0.047)        | (0.057)        |
| > 10 years $\times$ Treatment 1                          | 0.073***       | 0.045***       | 0.047***       | $0.051^{***}$  |
|                                                          | (0.003)        | (0.002)        | (0.006)        | (0.005)        |
| $>$ 10 years $\times$ Treatment 2                        | $-0.042^{***}$ | $-0.028^{***}$ | $-0.015^{***}$ | $-0.019^{***}$ |
|                                                          | (0.002)        | (0.002)        | (0.005)        | (0.002)        |
| ZIP code FE                                              |                | $\checkmark$   | $\checkmark$   | $\checkmark$   |
| Y first sale FE                                          |                | $\checkmark$   | $\checkmark$   | $\checkmark$   |
| Y second sale FE                                         |                | $\checkmark$   | $\checkmark$   | $\checkmark$   |
| Y first sale $\times$ Y first second FE                  |                |                | $\checkmark$   | $\checkmark$   |
| ZIP code $\times$ Y first sale FE                        |                |                | $\checkmark$   | $\checkmark$   |
| ZIP code $\times$ Y second sale FE                       |                |                | $\checkmark$   | $\checkmark$   |
| ZIP code $\times$ Y first sale $\times$ Y second sale FE |                |                |                | $\checkmark$   |
| Num. obs.                                                | 20,408         | 20,408         | 20,408         | 20,408         |
| R <sup>2</sup>                                           | 0.408          | 0.448          | 0.687          | 0.829          |

OLS regressions with the annualized appreciation rate as response variable. Standard errors are clustered at the ZIP code level. Sources: Expert Commitee for Property Values in Berlin; authors' calculations. \*\*\* p < 0.01; \*\* p < 0.05; \* p < 0.1

|                                                          | D                  | Dep. Var.: Annualized appreciation rate |                       |                |                     |  |
|----------------------------------------------------------|--------------------|-----------------------------------------|-----------------------|----------------|---------------------|--|
|                                                          | (1)                | (2)                                     | (3)                   | (4)            | (5)                 |  |
| Constant                                                 | 0.385***           | -0.269**                                |                       |                |                     |  |
| Π?                                                       | (0.025)<br>0.072** | (0.125)<br>0.078**                      | 0                     | _0 142         | _0 154*             |  |
| D2                                                       | (0.037)            | (0.031)                                 | (0.031)               | (0.093)        | (0.093)             |  |
| D3                                                       | $-0.075^{**}$      | $-0.100^{***}$                          | $-0.108^{***}$        | $-0.197^{***}$ | $-0.207^{***}$      |  |
| 20                                                       | (0.034)            | (0.030)                                 | (0.026)               | (0.074)        | (0.075)             |  |
| D4                                                       | -0.006             | -0.042                                  | $-0.082^{***}$        | $-0.163^{**}$  | $-0.171^{**}$       |  |
|                                                          | (0.032)            | (0.028)                                 | (0.028)               | (0.080)        | (0.084)             |  |
| D5                                                       | $-0.012^{'}$       | -0.058 <sup>**</sup>                    | -0.119 <sup>***</sup> | $-0.165^{*}$   | -0.154 <sup>*</sup> |  |
|                                                          | (0.032)            | (0.029)                                 | (0.027)               | (0.088)        | (0.092)             |  |
| D6                                                       | -0.044             | $-0.108^{***}$                          | $-0.163^{***}$        | $-0.256^{***}$ | $-0.270^{***}$      |  |
|                                                          | (0.034)            | (0.030)                                 | (0.030)               | (0.080)        | (0.083)             |  |
| D7                                                       | $-0.070^{*}$       | $-0.145^{***}$                          | $-0.199^{***}$        | $-0.295^{***}$ | $-0.306^{***}$      |  |
|                                                          | (0.036)            | (0.031)                                 | (0.029)               | (0.098)        | (0.100)             |  |
| D8                                                       | -0.092**           | $-0.183^{***}$                          | $-0.231^{***}$        | $-0.434^{***}$ | $-0.458^{***}$      |  |
|                                                          | (0.036)            | (0.032)                                 | (0.029)               | (0.109)        | (0.113)             |  |
| D9                                                       | -0.171***          | $-0.281^{***}$                          | -0.326***             | -0.487***      | -0.507***           |  |
| D10                                                      | (0.030)            | (0.033)                                 | (0.031)               | (0.109)        | (0.115)             |  |
| D10                                                      | -0.21/***          | -0.345***                               | -0.426***             | -0.62/***      | -0.66/***           |  |
|                                                          | (0.031)            | (0.035)                                 | (0.036)               | (0.136)        | (0.152)             |  |
| Basic apartment controls                                 |                    | $\checkmark$                            | $\checkmark$          | $\checkmark$   | $\checkmark$        |  |
| ZIP code FE                                              |                    |                                         | $\checkmark$          | $\checkmark$   | $\checkmark$        |  |
| Y first sale FE                                          |                    |                                         | $\checkmark$          | $\checkmark$   | $\checkmark$        |  |
| Y second sale FE                                         |                    |                                         | $\checkmark$          | $\checkmark$   | $\checkmark$        |  |
| Y first sale $\times$ Y first second FE                  |                    |                                         |                       | $\checkmark$   | $\checkmark$        |  |
| ZIP code $\times$ Y first sale FE                        |                    |                                         |                       | $\checkmark$   | √                   |  |
| ZIP code $\times$ Y second sale FE                       |                    |                                         |                       | $\checkmark$   | $\checkmark$        |  |
| ZIP code $\times$ Y first sale $\times$ Y second sale FE | 4745               |                                         |                       |                |                     |  |
| Num. obs.                                                | 4,/45              | 4,/45                                   | 4,/45                 | 4,/45          | 4,/45               |  |
| R <sup>2</sup>                                           | 0.032              | 0.055                                   | 0.355                 | 0.883          | 0.896               |  |

TABLE A3. Appreciation rate heterogeneity by winning bid in foreclosure auction

OLS regressions with the annualized appreciation rate as the response variable. We restrict our sample to only Treatment 1 observations and divide the sample by deciles of the winning bid in the foreclosure auction. The first decile is the reference category. Basic apartment controls include: Log of floor space, number of rooms, age of the building, and the squared term of the age of the building. Standard errors are clustered at the ZIP code level. <u>Sources:</u> Expert Commitee for Property Values in Berlin; authors' calculations. \*\*\* p < 0.05; \* p < 0.1

|                                                          |                        |                        | Dep. Vaı                 | :: Annualiz              | ed appreciati          | on rate                |                      |                      |
|----------------------------------------------------------|------------------------|------------------------|--------------------------|--------------------------|------------------------|------------------------|----------------------|----------------------|
|                                                          | Π                      | Full Treatme           | ent 1 Sample             | 0                        | Matchee                | l (Within) T           | reatment 1           | sample               |
|                                                          | (1)                    | (2)                    | (3)                      | (4)                      | (5)                    | (9)                    | (2)                  | (8)                  |
| Constant                                                 | 0.462***<br>(0.021)    |                        |                          |                          | 0.472***<br>(0.021)    |                        |                      |                      |
| Investor type: Private                                   | $-0.213^{***}$ (0.020) | $-0.110^{***}$ (0.017) | $-0.098^{**}$<br>(0.043) | $-0.101^{**}$<br>(0.049) | $-0.205^{***}$ (0.019) | $-0.092^{**:}$ (0.019) | * -0.122*<br>(0.072) | $-0.123^{*}$ (0.074) |
| ZIP code FE                                              |                        | >                      | >                        | >                        |                        | >                      | >                    |                      |
| Y first sale FE                                          |                        | >                      | >                        | >                        |                        | >                      | >                    | >                    |
| Y second sale FE                                         |                        | >                      | >                        | >                        |                        | >                      | >                    | >                    |
| Y first sale $\times$ Y first second FE                  |                        |                        | >                        | >                        |                        |                        | >                    | >                    |
| ZIP code $	imes$ Y first sale FE                         |                        |                        | >                        | >                        |                        |                        | >                    | >                    |
| ZIP code $	imes$ Y second sale FE                        |                        |                        | >                        | >                        |                        |                        | >                    | >                    |
| ZIP code $\times$ Y first sale $\times$ Y second sale FE |                        |                        |                          | >                        |                        |                        |                      | >                    |
| Num. obs.                                                | 4, 740                 | 4, 740                 | 4, 740                   | 4, 740                   | 2, 390                 | 2, 390                 | 2, 390               | 2, 390               |
| $\mathbb{R}^2$                                           | 0.065                  | 0.333                  | 0.876                    | 0.888                    | 0.059                  | 0.398                  | 0.905                | 0.906                |
|                                                          |                        |                        |                          |                          |                        |                        |                      |                      |

(5)–(8), we use a matched within sample of Treatment 1 observations, where we 1:1 match our total of 1,195 repeat sales of corporations to similar ones (based on a vector of six covariates) of private investors. Standard errors are clustered at the ZIP code level. <u>Sources</u>: Expert Committee for Property Values in Berlin; authors' calculations. \*\*\* p < 0.05; \* p < 0.05; \* p < 0.01OLS regressions with the annualized appreciation rate as the response variable. We restrict our sample to only Treatment 1 observations and distinguish between two types of buyers/investors: private individuals and corporations with the latter being the reference category. In columns



B. Variable "Holding period"

#### FIGURE A1. Distributional balance for "Date of second sale" and "Holding Period"

These figures document the distribution of variables "Date of second sale" (Figure A1A) and "Holding period" (Figure A1B) in the unmatched and the matched sample. After matching, although small differences in means persist, the distributions in these variables are fairly identical between foreclosed and non-foreclosed repeat sales. <u>Sources:</u> Expert Commitee for Property Values in Berlin; authors' calculations.

|   | Start  | End    | Duration<br>(# quarters) | Amplitude<br>(in %)                                                          |
|---|--------|--------|--------------------------|------------------------------------------------------------------------------|
| 1 | 1995Q2 | 1997Q3 | 9                        | $\begin{array}{r} -3.6 \\ -1.1 \\ -6.5 \\ -2.9 \\ -1.1 \\ -12.7 \end{array}$ |
| 2 | 1998Q1 | 1999Q2 | 5                        |                                                                              |
| 3 | 2001Q1 | 2004Q1 | 12                       |                                                                              |
| 4 | 2008Q3 | 2009Q1 | 2                        |                                                                              |
| 5 | 2011Q4 | 2013Q1 | 5                        |                                                                              |
| 6 | 2019Q4 | 2020Q2 | 2                        |                                                                              |

TABLE A5. Recession Periods in Berlin's Regional Business Cycle 1993-2022

This table shows the six recession periods that are identified in Berlin's business cycle since 1993, i.e. their peaks (start), troughs (end), the duration in quarters, and the amplitude of the recession as the percentage change in GDP. <u>Sources:</u> Lehmann and Wikman (2025); authors' calculations.

|                                                          | Dep. Var.: Annualized appreciation rate |                                      |                                      |                                      |  |  |
|----------------------------------------------------------|-----------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--|--|
|                                                          | 2:1-match                               | 3:1-match                            | 4:1-match                            | 5:1-match                            |  |  |
| Treatment 1 (Foreclosure:Regular)                        | 0.204***                                | 0.197***                             | 0.193***                             | 0.187***                             |  |  |
| Treatment 2 (Regular:Foreclosure)                        | $(0.016) \\ -0.094^{***} \\ (0.005)$    | $(0.014) \\ -0.092^{***} \\ (0.005)$ | $(0.013) \\ -0.089^{***} \\ (0.004)$ | $(0.013) \\ -0.090^{***} \\ (0.004)$ |  |  |
| ZIP code FE                                              | $\checkmark$                            | $\checkmark$                         | $\checkmark$                         | $\checkmark$                         |  |  |
| Y first sale FE                                          | $\checkmark$                            | $\checkmark$                         | $\checkmark$                         | $\checkmark$                         |  |  |
| Y second sale FE                                         | $\checkmark$                            | $\checkmark$                         | $\checkmark$                         | $\checkmark$                         |  |  |
| Y first sale $\times$ Y first second FE                  | $\checkmark$                            | $\checkmark$                         | $\checkmark$                         | $\checkmark$                         |  |  |
| ZIP code $\times$ Y first sale FE                        | $\checkmark$                            | $\checkmark$                         | $\checkmark$                         | $\checkmark$                         |  |  |
| ZIP code $\times$ Y second sale FE                       | $\checkmark$                            | $\checkmark$                         | $\checkmark$                         | $\checkmark$                         |  |  |
| ZIP code $\times$ Y first sale $\times$ Y second sale FE | $\checkmark$                            | $\checkmark$                         | $\checkmark$                         | $\checkmark$                         |  |  |
| No. obs.                                                 | 30,597                                  | 40,735                               | 50,761                               | 60,220                               |  |  |
| # Treated   # Matched Control                            | 10,204   20,393                         | 10,204   30,531                      | 10,204   40,557                      | 10,204   50,016                      |  |  |
| $\mathbb{R}^2$                                           | 0.756                                   | 0.723                                | 0.705                                | 0.691                                |  |  |

# TABLE A6. Robust results with k:1-matching

OLS regressions with the annualized holding period return as response variable. The regression model is constant across columns but used samples vary depending on the matching procedure indicated in the column header. Note that the matching algorithm could not always assign k control units to each treated unit. Standard errors are clustered at the ZIP code level. Sources: Expert Commitee for Property Values in Berlin; authors' calculations. \*\*\* p < 0.01; \*\* p < 0.05; \* p < 0.1

| $\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                       |                      |            | 1 () 1 4 7 4 7 | <b>m</b> , | 0 ()1 5 450) |                |         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|----------------------|------------|----------------|------------|--------------|----------------|---------|
| $\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                       |                      | Treatment  | 1 (N=4,/45)    | Treatment  | 2 (N=5,459)  |                |         |
| $ \begin{array}{c c c c c c c c c c c c c c c c c c c $                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                       |                      | Mean       | Std. Dev.      | Mean       | Std. Dev.    | Diff. in Means | р       |
| Age of building at second sale (years)71.0373.9171.1873.690.850.220Holding period (in years)4.214.106.602.942.390.001Number of rooms2.300.992.260.96-0.040.039Floor space (sqm)65.892.73163.9626.13-1.93<0.001                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Sales price of second sale (EUR)      |                      | 120,115.41 | 108,701.80     | 65,676.85  | 65,905.49    | -54,438.56     | < 0.001 |
| $ \begin{array}{c ccccc} Holding period (in years) & 4.21 & 4.10 & 6.60 & 2.94 & 2.39 & <0.001 \\ Number of rooms & 2.30 & 0.99 & 2.26 & 0.96 & -0.04 & 0.039 \\ Ploor space (sqm) & 65.89 & 27.31 & 63.96 & 26.13 & -1.93 & <0.001 \\ Bathroom (dummy) & 0.90 & 0.30 & 0.90 & 0.30 & -0.00 & 0.88 \\ Separate WC (dummy) & 0.12 & 0.32 & 0.11 & 0.31 & -0.01 & 0.030 \\ Balcony (dummy) & 0.42 & 0.49 & 0.41 & 0.49 & -0.01 & 0.34 \\ Attic (dummy) & 0.01 & 0.11 & 0.02 & 0.12 & 0.00 & 0.246 \\ Attic (dummy) & 0.01 & 0.01 & 0.01 & 0.00 & 0.03 & 0.00 & 0.03 \\ Balcony (dummy) & 0.01 & 0.10 & 0.01 & 0.00 & 0.03 & 0.00 & 0.629 \\ Storage room (dummy) & 0.01 & 0.10 & 0.01 & 0.00 & 0.03 & 0.00 & 0.629 \\ Storage room (dummy) & 0.87 & 0.34 & 0.88 & 0.32 & 0.01 & 0.026 \\ Hallway (dummy) & 0.87 & 0.34 & 0.88 & 0.32 & 0.01 & 0.026 \\ Elevator (dummy) & 0.22 & 0.44 & 0.20 & 0.40 & -0.06 & <0.001 \\ Private garage (dummy) & 0.22 & 0.44 & 0.22 & 0.41 & 0.00 & 0.332 \\ Collective garage (dummy) & 0.22 & 0.44 & 0.22 & 0.41 & 0.00 & 0.322 \\ Parking lot (dummy) & 0.06 & 0.24 & 0.06 & 0.23 & -0.00 & 0.321 \\ \end{array}$            | Age of building at second sale (years | )                    | 71.03      | 35.91          | 71.88      | 33.69        | 0.85           | 0.220   |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Holding period (in years)             |                      | 4.21       | 4.10           | 6.60       | 2.94         | 2.39           | < 0.001 |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Number of rooms                       |                      | 2.30       | 0.99           | 2.26       | 0.96         | -0.04          | 0.039   |
| $\begin{array}{c c c c c c c c c c c c c c c c c c c $                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Floor space (sqm)                     |                      | 65.89      | 27.31          | 63.96      | 26.13        | -1.93          | < 0.001 |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Bathroom (dummy)                      |                      | 0.90       | 0.30           | 0.90       | 0.30         | -0.00          | 0.886   |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Separate WC (dummy)                   |                      | 0.12       | 0.32           | 0.11       | 0.31         | -0.01          | 0.030   |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Balcony (dummy)                       |                      | 0.42       | 0.49           | 0.41       | 0.49         | -0.01          | 0.346   |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Attic (dummy)                         |                      | 0.01       | 0.11           | 0.02       | 0.12         | 0.00           | 0.246   |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Basement (dummy)                      |                      | 0.71       | 0.45           | 0.71       | 0.45         | -0.00          | 0.964   |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Atelier (dummy)                       |                      | 0.00       | 0.03           | 0.00       | 0.03         | 0.00           | 0.605   |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Hobby room (dummy)                    |                      | 0.01       | 0.10           | 0.01       | 0.09         | -0.00          | 0.629   |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Storage room (dummy)                  |                      | 0.58       | 0.49           | 0.55       | 0.50         | -0.02          | 0.020   |
| $\begin{array}{cccc} Corridor (dummy) & 0.87 & 0.34 & 0.88 & 0.32 & 0.01 & 0.026 \\ Elevator (dummy) & 0.26 & 0.44 & 0.20 & 0.40 & -0.06 & <0.001 \\ Private garage (dummy) & 0.22 & 0.41 & 0.22 & 0.41 & 0.00 & 0.832 \\ October garage (dummy) & 0.06 & 0.24 & 0.06 & 0.23 & -0.00 & 0.321 \\ \hline \\ Collective garage (dummy) & 0.06 & 0.24 & 0.06 & 0.23 & -0.00 & 0.321 \\ \hline \\ Location quality & Basic & 1976 & 41.6 & 2,699 & 49.4 \\ Good & 1,208 & 25.5 & 1,110 & 20.3 \\ Intermediate & 1,472 & 31.0 & 1,546 & 28.3 \\ Very Good & 89 & 1.9 & 104 & 1.9 \\ Type of Apartment & Attic Apartment & 309 & 6.5 & 279 & 5.1 \\ Duplex Apartment & 92 & 1.9 & 97 & 1.8 \\ Floor Apartment & 4,325 & 91.1 & 5,059 & 92.7 \\ Loft & 0 & 0.0 & 2 & 0.0 \\ Penthouse & 3 & 0.1 & 2 & 0.0 \\ Storefront Apartment & 12 & 0.3 & 16 & 0.3 \\ Terrace Apartment & 4 & 0.1 & 4 & 0.1 \\ Floor level & Basement floor & 25 & 0.5 & 27 & 0.5 \\ First floor & 999 & 21.1 & 1,275 & 23.4 \\ Mezzanine floor & 39 & 0.8 & 58 & 1.1 \\ Upper floors & 3,682 & 77.6 & 4,099 & 75.1 \\ \end{array}$                                                              | Hallway (dummy)                       |                      | 0.17       | 0.37           | 0.14       | 0.35         | -0.02          | 0.003   |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Corridor (dummy)                      |                      | 0.87       | 0.34           | 0.88       | 0.32         | 0.01           | 0.026   |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Elevator (dummy)                      |                      | 0.26       | 0.44           | 0.20       | 0.40         | -0.06          | < 0.001 |
| $\begin{array}{c c} \hline \text{Collective garage (dummy)} & 0.01 & 0.09 & 0.01 & 0.10 & 0.00 & 0.328 \\ \hline \text{Parking lot (dummy)} & 0.06 & 0.24 & 0.06 & 0.23 & -0.00 & 0.321 \\ \hline \\ \hline \text{Location quality} & \text{Basic} & 1976 & 41.6 & 2,699 & 49.4 \\ \hline \text{Good} & 1,208 & 25.5 & 1,110 & 20.3 \\ \hline \text{Intermediate} & 1,472 & 31.0 & 1,546 & 28.3 \\ \hline \text{Very Good} & 89 & 1.9 & 104 & 1.9 \\ \hline \text{Type of Apartment} & \text{Attic Apartment} & 309 & 6.5 & 279 & 5.1 \\ \hline \text{Duplex Apartment} & 92 & 1.9 & 97 & 1.8 \\ \hline \text{Floor Apartment} & 4,325 & 91.1 & 5,059 & 92.7 \\ \hline \text{Loft} & 0 & 0.0 & 2 & 0.0 \\ \hline \text{Penthouse} & 3 & 0.1 & 2 & 0.0 \\ \hline \text{Storefront Apartment} & 12 & 0.3 & 16 & 0.3 \\ \hline \text{Terrace Apartment} & 4 & 0.1 & 4 & 0.1 \\ \hline \text{Floor level} & \hline \text{Basement floor} & 25 & 0.5 & 27 & 0.5 \\ \hline \text{First floor} & 999 & 21.1 & 1,275 & 23.4 \\ \hline \text{Mezzanine floor} & 39 & 0.8 & 58 & 1.1 \\ \hline \text{Upper floors} & 3,682 & 77.6 & 4,099 & 75.1 \\ \hline \end{array}$ | Private garage (dummy)                |                      | 0.22       | 0.41           | 0.22       | 0.41         | 0.00           | 0.832   |
| $\begin{array}{c c c c c c c c c c c c c c c c c c c $                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Collective garage (dummy)             |                      | 0.01       | 0.09           | 0.01       | 0.10         | 0.00           | 0.328   |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Parking lot (dummy)                   |                      | 0.06       | 0.24           | 0.06       | 0.23         | -0.00          | 0.321   |
| $ \begin{array}{cccc} \text{Location quality} & \text{Basic} & 1976 & 41.6 & 2,699 & 49.4 \\ \text{Good} & 1,208 & 25.5 & 1,110 & 20.3 \\ \text{Intermediate} & 1,472 & 31.0 & 1,546 & 28.3 \\ \text{Very Good} & 89 & 1.9 & 104 & 1.9 \\ \text{Type of Apartment} & 309 & 6.5 & 279 & 5.1 \\ \text{Duplex Apartment} & 92 & 1.9 & 97 & 1.8 \\ \text{Floor Apartment} & 4,325 & 91.1 & 5,059 & 92.7 \\ \text{Loft} & 0 & 0.0 & 2 & 0.0 \\ \text{Penthouse} & 3 & 0.1 & 2 & 0.0 \\ \text{Storefront Apartment} & 12 & 0.3 & 16 & 0.3 \\ \text{Terrace Apartment} & 4 & 0.1 & 4 & 0.1 \\ \text{Floor level} & \text{Basement floor} & 25 & 0.5 & 27 & 0.5 \\ \text{First floor} & 999 & 21.1 & 1,275 & 23.4 \\ \text{Mezzanine floor} & 39 & 0.8 & 58 & 1.1 \\ \text{Upper floors} & 3,682 & 77.6 & 4,099 & 75.1 \\ \end{array} $                                                                                                                                                                                                                                                                                                                               |                                       |                      | Ν          | Pct.           | Ν          | Pct.         |                |         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Location quality                      | Basic                | 1976       | 41.6           | 2.699      | 49.4         |                |         |
| $ \begin{array}{cccccccccccccccccccccccccccccccccccc$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 1 5                                   | Good                 | 1,208      | 25.5           | 1,110      | 20.3         |                |         |
| $ \begin{array}{cccccccccccccccccccccccccccccccccccc$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                       | Intermediate         | 1,472      | 31.0           | 1,546      | 28.3         |                |         |
| $ \begin{array}{cccccccccccccccccccccccccccccccccccc$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                       | Verv Good            | <b>8</b> 9 | 1.9            | 104        | 1.9          |                |         |
| Duplex Apartment       92       1.9       97       1.8         Floor Apartment       4,325       91.1       5,059       92.7         Loft       0       0.0       2       0.0         Penthouse       3       0.1       2       0.0         Storefront Apartment       12       0.3       16       0.3         Terrace Apartment       4       0.1       4       0.1         Floor level       Basement floor       25       0.5       27       0.5         First floor       999       21.1       1,275       23.4         Mezzanine floor       39       0.8       58       1.1         Upper floors       3,682       77.6       4,099       75.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Type of Apartment                     | Attic Apartment      | 309        | 6.5            | 279        | 5.1          |                |         |
| $ \begin{array}{cccccccccccccccccccccccccccccccccccc$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 51 1                                  | Duplex Apartment     | 92         | 1.9            | 97         | 1.8          |                |         |
| $ \begin{array}{cccccccccccccccccccccccccccccccccccc$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                       | Floor Apartment      | 4.325      | 91.1           | 5.059      | 92.7         |                |         |
| Penthouse         3         0.1         2         0.0           Storefront Apartment         12         0.3         16         0.3           Terrace Apartment         4         0.1         4         0.1           Floor level         Basement floor         25         0.5         27         0.5           First floor         999         21.1         1,275         23.4           Mezzanine floor         39         0.8         58         1.1           Upper floors         3,682         77.6         4,099         75.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                       | Loft                 | 0          | 0.0            | 2          | 0.0          |                |         |
| Storefront Apartment         12         0.3         16         0.3           Terrace Apartment         4         0.1         4         0.1           Floor level         Basement floor         25         0.5         27         0.5           First floor         999         21.1         1,275         23.4           Mezzanine floor         39         0.8         58         1.1           Upper floors         3,682         77.6         4,099         75.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                       | Penthouse            | 3          | 0.1            | 2          | 0.0          |                |         |
| Terrace Apartment         4         0.1         4         0.1           Floor level         Basement floor         25         0.5         27         0.5           First floor         999         21.1         1,275         23.4           Mezzanine floor         39         0.8         58         1.1           Upper floors         3,682         77.6         4,099         75.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                       | Storefront Apartment | 12         | 0.3            | 16         | 0.3          |                |         |
| Floor level         Basement floor         25         0.5         27         0.5           First floor         999         21.1         1,275         23.4           Mezzanine floor         39         0.8         58         1.1           Upper floors         3,682         77.6         4,099         75.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                       | Terrace Apartment    | 4          | 0.1            | 4          | 0.1          |                |         |
| First floor99921.11,27523.4Mezzanine floor390.8581.1Upper floors3,68277.64,09975.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Floor level                           | Basement floor       | 25         | 0.5            | 27         | 0.5          |                |         |
| Mezzanine floor390.8581.1Upper floors3,68277.64,09975.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                       | First floor          | 999        | 21.1           | 1,275      | 23.4         |                |         |
| Upper floors 3,682 77.6 4,099 75.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                       | Mezzanine floor      | 39         | 0.8            | 58         | 1.1          |                |         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                       | Upper floors         | 3,682      | 77.6           | 4,099      | 75.1         |                |         |

# TABLE A7. Descriptive statistics on Treatment-1 and Treatment-2-apartments

The table reports descriptive statistics on Treatment-1 and Treatment-2-transactions used in the repeat sales analysis. In general, it seems that the hedonic characteristics of apartments in the two "treatment regimes" do not differ. <u>Sources:</u> Expert Commitee for Property Values in Berlin; authors' calculations.

### TABLE A8. Descriptive statistics on Control and Treatment apartments in double and triple repeat sales

| $\begin{split}                                      $                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Double 1                                                                                                                                                                                                               | RS (Contr.) (N=10,204)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Triple                                                                                                                                                                                                               | RS (Contr.) (N=2,239)                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Age of building (years)       71.76       34.33       75.56       34.07       3.39       c0.001         Floor space (sqm)       64.42       25.52       64.88       27.18       -0.35       6.59         Bathroom (furmmy)       0.30       0.30       0.33       0.13       -0.30       0.05         Bathroom (furmmy)       0.31       0.44       0.50       0.41       0.49       0.00       0.01       0.01       0.01       0.01       0.01       0.01       0.01       0.01       0.01       0.01       0.02       0.02       0.02       0.01       0.01       0.00       0.03       0.00       0.23       0.00       0.259         Basement (dummy)       0.05       0.38       0.49       0.35       0.36       0.00       0.01       0.01       0.01       0.01       0.01       0.01       0.01       0.01       0.01       0.01       0.01       0.00       0.02       0.00       0.02       0.00       0.02       0.00       0.02       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00       0.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Mean                                                                                                                                                                                                                   | Std. Dev.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Mean                                                                                                                                                                                                                 | Std. Dev.                                                                                                                                                                                                                                                                                                       | Diff. in Means                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | р                                                                                                                                                      |
| Number of rooms         2.22         0.39         2.33         0.038         -0.04         0.114           Deror space (sqn)         6.44         25.62         6.43         22.63         0.38         -0.02         0.03         0.03         0.01         0.33         0.01         0.35         Datacony (dummy)         0.01         0.01         0.03         0.01         0.03         0.01         0.03         0.01         0.03         0.01         0.03         0.03         0.01         0.04         0.05         0.04         0.01         0.03         0.01         0.03         0.01         0.03         0.03         0.00         0.03         0.00         0.03         0.00         0.03         0.00         0.03         0.00         0.03         0.00         0.03         0.00         0.03         0.00         0.03         0.00         0.03         0.00         0.03         0.00         0.03         0.00         0.03         0.00         0.03         0.00         0.03         0.00         0.00         0.03         0.00         0.03         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Age of building (years)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 71.76                                                                                                                                                                                                                  | 34.53                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 75.36                                                                                                                                                                                                                | 34.07                                                                                                                                                                                                                                                                                                           | 3.59                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | < 0.001                                                                                                                                                |
| Bath room (dimmy)         001         122         0.89         0.31         0.02         0.02           Separate WC (dummy)         0.10         0.30         0.11         0.31         0.00         0.35           Balcony (dummy)         0.44         0.50         0.41         0.49         0.00         0.01           Attic (dummy)         0.01         0.11         0.02         0.12         0.00         0.01           Basement (dummy)         0.03         0.04         0.02         0.43         0.00         0.00           Balcony (dummy)         0.35         0.49         0.55         0.56         0.00         0.13           Indive (dummy)         0.38         0.49         0.55         0.40         0.00         0.374           Eventor (dummy)         0.24         0.43         0.20         0.40         0.00         0.24           Parking lot (dummy)         0.24         0.43         0.20         0.40         4.00         0.22         0.01         0.25           Parking lot (dummy)         0.24         0.43         0.20         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Number of rooms<br>Floor space (sam)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 2.27                                                                                                                                                                                                                   | 0.95<br>25.82                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2.23                                                                                                                                                                                                                 | 0.98<br>27.18                                                                                                                                                                                                                                                                                                   | -0.04<br>-0.33                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.114                                                                                                                                                  |
| Separate WC (dummy)         0.10         0.30         0.11         0.31         0.01         0.355           Balcary (dummy)         0.01         0.01         0.02         0.12         0.00         0.511           Attic (dummy)         0.01         0.01         0.02         0.02         0.00         0.021           Hohy room (dummy)         0.01         0.01         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0.03         0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Bathroom (dummy)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0.91                                                                                                                                                                                                                   | 0.29                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.89                                                                                                                                                                                                                 | 0.31                                                                                                                                                                                                                                                                                                            | -0.02                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0.032                                                                                                                                                  |
| Balcony (dummy)         0.44         0.50         0.41         0.49         -0.40         0.001           Basement (dummy)         0.01         0.11         0.02         0.12         0.00         0.51           Basement (dummy)         0.01         0.01         0.04         0.07         0.03         0.00         0.21           Ibbly room (dummy)         0.58         0.49         0.56         0.50         -0.02         0.11           Ibbly room (dummy)         0.15         0.36         0.15         0.36         0.00         0.91           Corridor (dummy)         0.88         0.33         0.89         0.32         0.01         0.01           Corridor (dummy)         0.24         0.40         0.22         0.40         0.40         0.20           Parking lor (dummy)         0.01         0.01         0.01         0.01         0.00         0.24           Coation quality         Basic         4586         1449         1040         464           Good         2266         222         475         21.2         1.1         0.1         1.2           Type of Apartment         13         0.1         5         0.2         5         1.1         0.1<                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Separate WC (dummy)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 0.10                                                                                                                                                                                                                   | 0.30                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.11                                                                                                                                                                                                                 | 0.31                                                                                                                                                                                                                                                                                                            | 0.01                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.395                                                                                                                                                  |
| Affic (summy)         0.01         0.11         0.02         0.12         0.00         0.01           Hobby prom (dummy)         0.00         0.01         0.00         0.03         0.00         0.281           Hobby prom (dummy)         0.01         0.01         0.00         0.03         0.00         0.281           Storage room (dummy)         0.15         0.36         0.05         0.02         0.191           Hallway (dummy)         0.24         0.43         0.29         0.40         -0.04         -0.00           Fritate garage (dummy)         0.24         0.41         0.22         0.41         0.00         0.828           Cortidor (dummy)         0.24         0.41         0.20         0.41         0.00         0.828           Fritate garage (dummy)         0.24         0.45         0.24         0.43         0.00         0.828           Location quality         Basic         N         Pt         N         Pt         N         Pt         0.00         0.24         0.00         0.24         0.00         0.24         0.00         0.26         1.15         0.1         1.16         0.16         1.16         0.16         1.16         0.16         1.16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Balcony (dummy)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0.44                                                                                                                                                                                                                   | 0.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.41                                                                                                                                                                                                                 | 0.49                                                                                                                                                                                                                                                                                                            | -0.04                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0.001                                                                                                                                                  |
| Arcelier (dummy)         0.00         0.01         0.00         0.03         0.00         0.23           Mobby cons (dummy)         0.58         0.49         0.56         0.50         -0.02         0.13           Storage room (dummy)         0.88         0.33         0.89         0.32         0.00         0.21           Corridor (dummy)         0.88         0.33         0.89         0.32         0.00         0.82           Collective garage (dummy)         0.01         0.01         0.01         0.00         0.02         4.00         0.828           Collective garage (dummy)         0.01         0.01         0.01         0.00         0.02         4.00         0.080           Collective garage (dummy)         0.01         0.01         0.01         0.00         0.02         4.00         0.00         0.02           Collective garage (dummy)         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Attic (dummy)<br>Basement (dummy)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0.01                                                                                                                                                                                                                   | 0.11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.02                                                                                                                                                                                                                 | 0.12                                                                                                                                                                                                                                                                                                            | 0.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.511                                                                                                                                                  |
| Hobby room (dummy)         0.01         0.02         0.01         0.00         0.08         0.00         0.148           Storage room (dummy)         0.15         0.34         0.15         0.36         0.00         0.01           Hallway (dummy)         0.15         0.34         0.15         0.36         0.00         0.01           Evision (dummy)         0.23         0.42         0.22         0.42         0.00         0.828           Collective garage (dummy)         0.06         0.24         0.06         0.24         0.00         0.808           Location quality         Basic         4586         443         1040         0.464         664           Type of Apartment         Basic         4586         443         1040         664         622         67         21.2         75         21.2         75         21.2         75         21.2         75         21.2         75         21.2         75         21.2         76         21.2         76         21.2         76         21.2         77         21.2         70.3         11         0.1         70.3         70.3         70.3         70.3         70.1         70.8         70.3         70.3         70.3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Atelier (dummy)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0.00                                                                                                                                                                                                                   | 0.40                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.00                                                                                                                                                                                                                 | 0.03                                                                                                                                                                                                                                                                                                            | 0.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.281                                                                                                                                                  |
| Storage room (dummy)         0.58         0.49         0.56         0.50         -0.02         0.191           Corridor (dummy)         0.83         0.33         0.85         0.02         0.01         0.21           Corridor (dummy)         0.34         0.35         0.35         0.00         0.22         0.01         0.22           Firstate genomementy         0.01         0.01         0.01         0.01         0.00         0.828           Collective garage (dummy)         0.00         0.06         0.24         0.06         0.24         0.00         0.838           Collective garage (dummy)         0.01         0.01         0.01         0.01         0.00         0.808           Collective garage (dummy)         0.00         2266         2.22         475         2.14           Type of Apartment         615         6.0         126         5.5         5           Foor Apartment         181         1.8         33         1.5         5         0.2           Fist foor         partment         12         0.1         3         0.1         5         0.2         5         0.05         0.02         5         0.05         0.02         5         0.05                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Hobby room (dummy)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 0.01                                                                                                                                                                                                                   | 0.10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.01                                                                                                                                                                                                                 | 0.08                                                                                                                                                                                                                                                                                                            | 0.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.148                                                                                                                                                  |
| Description         Data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Storage room (dummy)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0.58                                                                                                                                                                                                                   | 0.49                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.56                                                                                                                                                                                                                 | 0.50                                                                                                                                                                                                                                                                                                            | -0.02                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0.191                                                                                                                                                  |
| Elevator (dummy)         0.24         0.43         0.20         0.40         -0.04         -0.04         -0.04         -0.04         -0.04         -0.04         -0.04         -0.04         -0.06         0.22         0.42         0.00         0.828         Collective garage (dummy)         0.01         0.01         0.01         0.01         0.06         0.24         0.00         0.828           Collective garage (dummy)         0.06         0.24         0.06         0.24         0.00         0.828           Collective garage (dummy)         0.06         0.24         4.86         0.04         4.64         104         4.64           Collective garage (dummy)         0.06         0.24         4.83         1.9         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.6         1.6         1.26         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.5         1.6 <td>Corridor (dummy)</td> <td>0.15</td> <td>0.36</td> <td>0.15</td> <td>0.30</td> <td>0.00</td> <td>0.374</td>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Corridor (dummy)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0.15                                                                                                                                                                                                                   | 0.36                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.15                                                                                                                                                                                                                 | 0.30                                                                                                                                                                                                                                                                                                            | 0.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.374                                                                                                                                                  |
| Private garage (dummy)         0.23         0.42         0.22         0.42         0.00         0.828           Collective garage (dummy)         0.06         0.24         0.06         0.24         0.00         0.26           Location quality         Basic         4586         44.9         1040         46.4         0.00         0.26           Good         2266         22.2         475         21.2         11         11         10.3         10.1         10.0         0.20         10.1         10.0         10.1         10.1         10.1         10.1         10.1         10.1         10.1         10.1         10.1         10.1         10.1         10.1         10.1         10.1         10.1         10.1         10.1         10.1         10.1         10.1         10.1         10.1         10.1         10.1         10.1         10.1         10.1         10.1         10.1         10.1         10.1         10.1         10.1         10.1         10.1         10.1         10.1         10.1         10.1         10.1         10.1         10.1         10.1         10.1         10.1         10.1         10.1         10.1         10.1         10.1         10.1         10.1         10.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Elevator (dummy)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0.24                                                                                                                                                                                                                   | 0.43                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.20                                                                                                                                                                                                                 | 0.40                                                                                                                                                                                                                                                                                                            | -0.04                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | < 0.001                                                                                                                                                |
| Collective garage (dummy)         0.01         0.11         0.01         0.01         0.01         0.00         0.246         0.00         0.286           Location quality         Basic         4586         44.9         1040         46.4           Good         2266         22.2         475         21.2         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         111         1111         111         111                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Private garage (dummy)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.23                                                                                                                                                                                                                   | 0.42                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.22                                                                                                                                                                                                                 | 0.42                                                                                                                                                                                                                                                                                                            | 0.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.828                                                                                                                                                  |
| Tailing for (unimity)         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00           Location quality         Basic         4586         44.9         1040         46.4         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Collective garage (dummy)<br>Parking lot (dummy)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0.01                                                                                                                                                                                                                   | 0.11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.01                                                                                                                                                                                                                 | 0.10                                                                                                                                                                                                                                                                                                            | 0.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.266                                                                                                                                                  |
| Location quality<br>Good         Basic         458 b         149 b         140 b         145 b           Type of Apartment         3107         3204         681         30.4           Type of Apartment         615         6.00         126         5.6           Duplex Apartment         181         1.8         33         1.5           Floor Apartment         9377         91.9         2070         92.5           Storefront Apartment         13         0.1         5         0.2           Floor level         Basement floor         27         0.3         11         0.5           Mezzanine floor         13         0.8         19         0.8         0.0         0.00           Mezzanine floor         812         79.7         1708         76.3         11         0.5           Mezzanine floor         812         0.8         19         0.8         0.00         0.00           Starbor Apartment         12.2         0.1         3.01         2.2         0.1         3.01         0.8         0.8         0.8         0.8         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0.00<br>N                                                                                                                                                                                                              | Dot                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.00<br>N                                                                                                                                                                                                            | Dot                                                                                                                                                                                                                                                                                                             | 0.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.000                                                                                                                                                  |
| Good         2266         22.2         475         21.2           Type of Apartment         Intermediate         3107         30.4         681         30.4           Yery Good         245         2.4         43         1.9           Attic Apartment         615         6.0         126         5.5           Duplex Apartment         181         1.8         33         1.5           Floor Apartment         13         0.1         5         0.2           Floor Isevel         Attic Apartment         13         0.1         5         0.2           Floor Isevel         First floor         1966         19.3         501         22.4           Floor Isevel         Mezzanine floor         1966         19.3         501         22.4           Mezzanine floor         1966         19.3         501         22.4         3.65         0.001           Nege of building (years)         7.149         34.74         7.514         36.5         0.001         0.00         0.5         0.00         0.00         0.00         0.00         0.00         0.00         0.01         0.01         0.01         0.01         0.00         0.00         0.00         0.00         0.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Location quality Basic                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 4586                                                                                                                                                                                                                   | 44.9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1040                                                                                                                                                                                                                 | 46.4                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                        |
| Intermediate         3107         30.4         681         30.4           Type of Apartment         Attic Apartment         615         6.0         126         5.6           Duplex Apartment         181         1.8         33         1.5         Floor Apartment         181         1.8         33         1.5           Floor Apartment         9377         91.9         2070         92.5         0.0         0         0.0           Floor Apartment         12         0.0         1         5         0.2         0.1         Storefront Apartment         12         0.1         3         0.1         External Apartment         12         0.1         0.1         1.0         12         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0         1.0 </td <td>Good</td> <td>2266</td> <td>22.2</td> <td>475</td> <td>21.2</td> <td></td> <td></td>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Good                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 2266                                                                                                                                                                                                                   | 22.2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 475                                                                                                                                                                                                                  | 21.2                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                        |
| Type of Apartment         Very Good         243         2.4         4.3         1.5           Type of Apartment         Duplex Apartment         615         6.0         126         5.6           Ploor Apartment         181         1.8         33         1.5           Floor Apartment         2         0.0         0         0.0           Penthouse         4         0.0         2         0.1           Storefront Apartment         13         0.1         3         0.2           Meszzanine floor         1966         19.3         501         22.4           Meszanine floor         1966         19.3         501         22.4           Meszanine floor         8128         79.7         1708         76.3           Ploor s         8128         79.7         1708         76.3           Ploor s         2.28         0.94         2.22         0.05         0.00           Number of rooms         2.28         0.94         2.21         0.05         0.03         0.00         0.03           Separate WC (dummy)         0.01         0.11         0.32         0.11         0.31         0.01         0.18         0.22         0.03         0.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Intermediate                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 3107                                                                                                                                                                                                                   | 30.4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 681                                                                                                                                                                                                                  | 30.4                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                        |
| Type of a partment         Initial partment         0.81         0.13         0.13         0.13         0.13         0.13         0.13         0.13         0.13         0.13         0.13         0.13         0.13         0.13         0.13         0.13         0.13         0.13         0.13         0.15         0.15         0.15         0.15         0.15         0.15         0.15         0.15         0.15         0.15         0.15         0.15         0.15         0.15         0.15         0.15         0.15         0.15         0.15         0.15         0.15         0.15         0.15         0.15         0.15         0.15         0.15         0.15         0.15         0.15         0.15         0.15         0.15         0.15         0.16         0.15         0.16         0.15         0.16         0.15         0.16         0.15         0.16         0.15         0.16         0.15         0.16         0.15         0.16         0.15         0.16         0.15         0.16         0.15         0.16         0.15         0.16         0.15         0.16         0.15         0.16         0.15         0.15         0.16         0.15         0.15         0.15         0.16         0.15         0.16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Type of Apartment Attic Apartment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 245                                                                                                                                                                                                                    | 2.4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 43<br>126                                                                                                                                                                                                            | 1.9                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                        |
| $ \begin{array}{ c c c c c c c c c c c c c c c c c c c$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Duplex Apartment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 181                                                                                                                                                                                                                    | 1.8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 33                                                                                                                                                                                                                   | 1.5                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                        |
| $ \begin{array}{c c c c c c c c c c c c c c c c c c c $                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Floor Apartment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 9377                                                                                                                                                                                                                   | 91.9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 2070                                                                                                                                                                                                                 | 92.5                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                        |
| $ \begin{array}{c c c c c c c c c c c c c c c c c c c $                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Loft                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 2                                                                                                                                                                                                                      | 0.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0                                                                                                                                                                                                                    | 0.0                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                        |
| Floor level         Double Apartment<br>Basement floor         12<br>27         0.3<br>11         1<br>0.5<br>0.5           First floor         1966         19.3<br>100         501         22.4<br>100           Mezzanine floor         83         0.8<br>128         19         0.8<br>19         0.8<br>19           Jupper floors         8128         79.7         1708         76.3           Mean         Std. Dev.         Mean         Std. Dev.         Diff. in Means         p           Age of building (years)         71.49         34.74         75.14         33.59         3.65         <0.001                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Penthouse<br>Storefront Apartment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 4                                                                                                                                                                                                                      | 0.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2                                                                                                                                                                                                                    | 0.1                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                        |
| $ \begin{array}{c c c c c c c c c c c c c c c c c c c $                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Terrace Apartment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 12                                                                                                                                                                                                                     | 0.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 3                                                                                                                                                                                                                    | 0.1                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                        |
| $ \begin{array}{ c c c c c c c c c c c c c c c c c c c$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Floor level Basement floor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 27                                                                                                                                                                                                                     | 0.3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 11                                                                                                                                                                                                                   | 0.5                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                        |
| $\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | First floor<br>Meggepine floor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 1966                                                                                                                                                                                                                   | 19.3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 501                                                                                                                                                                                                                  | 22.4                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                        |
| $\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Upper floors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 8128                                                                                                                                                                                                                   | 79.7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1708                                                                                                                                                                                                                 | 76.3                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                        |
| $\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Double                                                                                                                                                                                                                 | RS (Treat.) (N=10,204)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Triple                                                                                                                                                                                                               | RS (Treat.) (N=2,239)                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                        |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Mean                                                                                                                                                                                                                   | Std. Dev.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Mean                                                                                                                                                                                                                 | Std. Dev.                                                                                                                                                                                                                                                                                                       | Diff. in Means                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | р                                                                                                                                                      |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Age of building (years)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 71.49                                                                                                                                                                                                                  | 34.74                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 75.14                                                                                                                                                                                                                | 33.59                                                                                                                                                                                                                                                                                                           | 3.65                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | < 0.001                                                                                                                                                |
| $ \begin{array}{cccccccccccccccccccccccccccccccccccc$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Number of rooms                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 2.28                                                                                                                                                                                                                   | 0.98                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 2.22                                                                                                                                                                                                                 | 0.95                                                                                                                                                                                                                                                                                                            | -0.05                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0.020                                                                                                                                                  |
| $\begin{array}{c cccc} \begin{tabular}{ c c c c c c } \hline here & here &$ | Floor space (sqm)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 2.20                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                 | -0.05                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0.060                                                                                                                                                  |
| $ \begin{array}{c ccccc} \text{Sciparter (dummy)} & 0.11 & 0.42 & 0.11 & 0.51 & 0.51 & 0.01 & 0.12 \\ \text{Balcony} & 0.01 & 0.12 & 0.01 & 0.12 & 0.00 & 0.995 \\ \text{Basement (dummy)} & 0.71 & 0.45 & 0.72 & 0.45 & 0.01 & 0.215 \\ \text{Atelier (dummy)} & 0.00 & 0.03 & 0.00 & 0.00 & 0.00 & 0.00 \\ \text{Hobby room (dummy)} & 0.01 & 0.10 & 0.01 & 0.10 & 0.00 & 0.995 \\ \text{Storage room (dummy)} & 0.57 & 0.50 & 0.58 & 0.49 & 0.01 & 0.362 \\ \text{Hallway (dummy)} & 0.57 & 0.50 & 0.58 & 0.49 & 0.01 & 0.362 \\ \text{Hallway (dummy)} & 0.15 & 0.36 & 0.15 & 0.36 & 0.00 & 0.685 \\ \text{Corridor (dummy)} & 0.23 & 0.42 & 0.22 & 0.42 & -0.01 & 0.571 \\ \text{Elevator (dummy)} & 0.23 & 0.42 & 0.22 & 0.42 & -0.01 & 0.571 \\ \text{Elevator (dummy)} & 0.01 & 0.10 & 0.01 & 0.11 & 0.00 & 0.269 \\ \text{Private garage (dummy)} & 0.023 & 0.05 & 0.23 & 0.00 & 0.404 \\ \hline \text{Collective garage (dummy)} & 0.01 & 0.10 & 0.01 & 0.11 & 0.00 & 0.269 \\ \text{Parking lot (dummy)} & 0.06 & 0.23 & 0.05 & 0.23 & 0.00 & 0.404 \\ \hline \\ \text{Location quality} & & & & & & & & & & & & & & & & & & &$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 64.86                                                                                                                                                                                                                  | 26.70                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 63.70                                                                                                                                                                                                                | 26.16                                                                                                                                                                                                                                                                                                           | -1.15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0.000                                                                                                                                                  |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Bathroom (dummy)<br>Separate WC (dummy)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 64.86<br>0.90<br>0.11                                                                                                                                                                                                  | 26.70<br>0.30<br>0.32                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 63.70<br>0.90<br>0.11                                                                                                                                                                                                | 26.16<br>0.30<br>0.31                                                                                                                                                                                                                                                                                           | -0.03<br>-1.15<br>0.00<br>-0.01                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.715                                                                                                                                                  |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Bathroom (dummy)<br>Separate WC (dummy)<br>Balcony (dummy)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 64.86<br>0.90<br>0.11<br>0.41                                                                                                                                                                                          | 26.70<br>0.30<br>0.32<br>0.49                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 63.70<br>0.90<br>0.11<br>0.44                                                                                                                                                                                        | 26.16<br>0.30<br>0.31<br>0.50                                                                                                                                                                                                                                                                                   | -0.03<br>-1.15<br>0.00<br>-0.01<br>0.03                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0.715<br>0.489<br>0.009                                                                                                                                |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Bathroom (dummy)<br>Separate WC (dummy)<br>Balcony (dummy)<br>Attic (dummy)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 64.86<br>0.90<br>0.11<br>0.41<br>0.01                                                                                                                                                                                  | 26.70<br>0.30<br>0.32<br>0.49<br>0.12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 63.70<br>0.90<br>0.11<br>0.44<br>0.01                                                                                                                                                                                | 26.16<br>0.30<br>0.31<br>0.50<br>0.12                                                                                                                                                                                                                                                                           | -0.03<br>-1.15<br>0.00<br>-0.01<br>0.03<br>0.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.715<br>0.489<br>0.009<br>0.995                                                                                                                       |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Bathroom (dummy)<br>Separate WC (dummy)<br>Balcony (dummy)<br>Attic (dummy)<br>Basement (dummy)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 64.86<br>0.90<br>0.11<br>0.41<br>0.01<br>0.71                                                                                                                                                                          | 26.70<br>0.30<br>0.32<br>0.49<br>0.12<br>0.45                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 63.70<br>0.90<br>0.11<br>0.44<br>0.01<br>0.72                                                                                                                                                                        | 26.16<br>0.30<br>0.31<br>0.50<br>0.12<br>0.45                                                                                                                                                                                                                                                                   | $\begin{array}{c} -1.05\\ 0.00\\ -0.01\\ 0.03\\ 0.00\\ 0.01\\ 0.00\\ 0.01\\ 0.00\\ 0.01\\ 0.00\\ 0.01\\ 0.00\\ 0.01\\ 0.00\\ 0.01\\ 0.00\\ 0.01\\ 0.00\\ 0.01\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.0$ | 0.715<br>0.489<br>0.009<br>0.995<br>0.215                                                                                                              |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Bathroom (dummy)<br>Separate WC (dummy)<br>Balcony (dummy)<br>Attic (dummy)<br>Basement (dummy)<br>Atelier (dummy)<br>Hobby room (dummy)                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 64.86<br>0.90<br>0.11<br>0.41<br>0.01<br>0.71<br>0.00<br>0.01                                                                                                                                                          | 26.70<br>0.30<br>0.32<br>0.49<br>0.12<br>0.45<br>0.03<br>0.10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 63.70<br>0.90<br>0.11<br>0.44<br>0.01<br>0.72<br>0.00<br>0.01                                                                                                                                                        | $\begin{array}{c} 26.16\\ 0.30\\ 0.31\\ 0.50\\ 0.12\\ 0.45\\ 0.00\\ 0.10\\ \end{array}$                                                                                                                                                                                                                         | -0.03<br>-1.15<br>0.00<br>-0.01<br>0.03<br>0.00<br>0.01<br>0.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.715<br>0.489<br>0.009<br>0.995<br>0.215<br>0.005<br>0.990                                                                                            |
| $\begin{array}{c cccc} Corridor (dummy) & 0.88 & 0.33 & 0.88 & 0.32 & 0.00 & 0.571 \\ Elevator (dummy) & 0.23 & 0.42 & 0.22 & 0.42 & -0.01 & 0.571 \\ Private garage (dummy) & 0.22 & 0.41 & 0.22 & 0.42 & -0.00 & 0.671 \\ Collective garage (dummy) & 0.01 & 0.10 & 0.01 & 0.11 & 0.00 & 0.269 \\ Parking lot (dummy) & 0.06 & 0.23 & 0.05 & 0.23 & 0.00 & 0.404 \\ \hline \\ Location quality & Basic & 4675 & 45.8 & 1010 & 45.1 \\ Good & 2318 & 22.7 & 481 & 21.5 \\ Intermediate & 3018 & 29.6 & 706 & 31.5 \\ Very Good & 193 & 1.9 & 42 & 1.9 \\ Type of Apartment & 588 & 5.8 & 138 & 6.2 \\ Duplex Apartment & 189 & 1.9 & 34 & 1.5 \\ Floor Apartment & 9384 & 92.0 & 2062 & 92.1 \\ Loft & 2 & 0.0 & 0 & 0.0 \\ Penthouse & 5 & 0.0 & 0 & 0.0 \\ Penthouse & 5 & 0.0 & 0 & 0.0 \\ Floor level & Basement floor & 52 & 0.5 & 4 & 0.2 \\ Floor level & Basement floor & 52 & 0.5 & 4 & 0.2 \\ First floor & 2274 & 22.3 & 409 & 18.3 \\ \end{array}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Bathroom (dummy)<br>Separate WC (dummy)<br>Balcony (dummy)<br>Attic (dummy)<br>Basement (dummy)<br>Atelier (dummy)<br>Hobby room (dummy)<br>Storage room (dummy)                                                                                                                                                                                                                                                                                                                                                                                                                                        | $\begin{array}{c} 64.86\\ 0.90\\ 0.11\\ 0.41\\ 0.01\\ 0.71\\ 0.00\\ 0.01\\ 0.57\end{array}$                                                                                                                            | $\begin{array}{c} 26.70\\ 0.30\\ 0.32\\ 0.49\\ 0.12\\ 0.45\\ 0.03\\ 0.10\\ 0.50\\ \end{array}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 63.70<br>0.90<br>0.11<br>0.44<br>0.01<br>0.72<br>0.00<br>0.01<br>0.58                                                                                                                                                | $\begin{array}{c} 26.16\\ 0.30\\ 0.31\\ 0.50\\ 0.12\\ 0.45\\ 0.00\\ 0.10\\ 0.49\\ \end{array}$                                                                                                                                                                                                                  | $\begin{array}{c} -0.03 \\ -1.15 \\ 0.00 \\ -0.01 \\ 0.03 \\ 0.00 \\ 0.01 \\ 0.00 \\ 0.00 \\ 0.01 \end{array}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.715<br>0.489<br>0.009<br>0.995<br>0.215<br>0.005<br>0.990<br>0.362                                                                                   |
| $\begin{array}{c c c c c c c c c c c c c c c c c c c $                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Bathroom (dummy)<br>Separate WC (dummy)<br>Balcony (dummy)<br>Attic (dummy)<br>Basement (dummy)<br>Atelier (dummy)<br>Hobby room (dummy)<br>Storage room (dummy)<br>Hallway (dummy)                                                                                                                                                                                                                                                                                                                                                                                                                     | $\begin{array}{c} 2.20\\ 64.86\\ 0.90\\ 0.11\\ 0.41\\ 0.01\\ 0.71\\ 0.00\\ 0.01\\ 0.57\\ 0.15\end{array}$                                                                                                              | $\begin{array}{c} 26.70\\ 0.30\\ 0.32\\ 0.49\\ 0.12\\ 0.45\\ 0.03\\ 0.10\\ 0.50\\ 0.36\end{array}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 63.70<br>0.90<br>0.11<br>0.44<br>0.01<br>0.72<br>0.00<br>0.01<br>0.58<br>0.15                                                                                                                                        | $\begin{array}{c} 26.16\\ 0.30\\ 0.31\\ 0.50\\ 0.12\\ 0.45\\ 0.00\\ 0.10\\ 0.49\\ 0.36\end{array}$                                                                                                                                                                                                              | $\begin{array}{c} -0.03 \\ -1.15 \\ 0.00 \\ -0.01 \\ 0.03 \\ 0.00 \\ 0.01 \\ 0.00 \\ 0.01 \\ 0.00 \\ 0.01 \\ 0.00 \\ 0.01 \end{array}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0.000<br>0.715<br>0.489<br>0.009<br>0.995<br>0.215<br>0.005<br>0.990<br>0.362<br>0.685                                                                 |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Bathroom (dummy)<br>Separate WC (dummy)<br>Balcony (dummy)<br>Attic (dummy)<br>Basement (dummy)<br>Atelier (dummy)<br>Hobby room (dummy)<br>Storage room (dummy)<br>Hallway (dummy)<br>Corridor (dummy)<br>Elevator (dummy)                                                                                                                                                                                                                                                                                                                                                                             | 64.86<br>0.90<br>0.11<br>0.41<br>0.01<br>0.71<br>0.00<br>0.01<br>0.57<br>0.15<br>0.88<br>0.22                                                                                                                          | $\begin{array}{c} 26.70\\ 0.30\\ 0.32\\ 0.49\\ 0.12\\ 0.45\\ 0.03\\ 0.10\\ 0.50\\ 0.36\\ 0.33\\ 0.41\end{array}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 63.70<br>0.90<br>0.11<br>0.44<br>0.01<br>0.72<br>0.00<br>0.01<br>0.58<br>0.15<br>0.88<br>0.22                                                                                                                        | $\begin{array}{c} 26.16\\ 0.30\\ 0.31\\ 0.50\\ 0.12\\ 0.45\\ 0.00\\ 0.10\\ 0.49\\ 0.36\\ 0.32\\ 0.42\end{array}$                                                                                                                                                                                                | -0.03<br>-1.15<br>0.00<br>-0.01<br>0.03<br>0.00<br>0.01<br>0.00<br>0.00<br>0.00<br>0.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0.000<br>0.715<br>0.489<br>0.009<br>0.995<br>0.215<br>0.005<br>0.990<br>0.362<br>0.685<br>0.571                                                        |
| $\begin{array}{c c c c c c c c c c c c c c c c c c c $                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Bathroom (dummy)<br>Separate WC (dummy)<br>Balcony (dummy)<br>Attic (dummy)<br>Basement (dummy)<br>Hobby room (dummy)<br>Storage room (dummy)<br>Hallway (dummy)<br>Corridor (dummy)<br>Elevator (dummy)<br>Private garage (dummy)                                                                                                                                                                                                                                                                                                                                                                      | $\begin{array}{c} 64.86\\ 0.90\\ 0.11\\ 0.41\\ 0.01\\ 0.71\\ 0.00\\ 0.01\\ 0.57\\ 0.15\\ 0.88\\ 0.23\\ 0.22\\ \end{array}$                                                                                             | $\begin{array}{c} 26.70\\ 0.30\\ 0.32\\ 0.49\\ 0.12\\ 0.45\\ 0.03\\ 0.10\\ 0.50\\ 0.36\\ 0.33\\ 0.42\\ 0.41\\ \end{array}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 63.70<br>0.90<br>0.11<br>0.44<br>0.01<br>0.72<br>0.00<br>0.01<br>0.58<br>0.15<br>0.88<br>0.22<br>0.22                                                                                                                | $\begin{array}{c} 26.16\\ 0.30\\ 0.31\\ 0.50\\ 0.12\\ 0.45\\ 0.00\\ 0.10\\ 0.49\\ 0.36\\ 0.32\\ 0.42\\ 0.42\\ 0.42\\ \end{array}$                                                                                                                                                                               | $\begin{array}{c} -0.03\\ -1.15\\ 0.00\\ -0.01\\ 0.03\\ 0.00\\ 0.01\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ -0.01\\ 0.00\end{array}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | $\begin{array}{c} 0.000\\ 0.715\\ 0.489\\ 0.009\\ 0.995\\ 0.215\\ 0.005\\ 0.990\\ 0.362\\ 0.685\\ 0.571\\ 0.571\\ 0.571\\ 0.640 \end{array}$           |
| $ \begin{array}{c c c c c c c c c c c c c c c c c c c $                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Bathroom (dummy)<br>Separate WC (dummy)<br>Balcony (dummy)<br>Attic (dummy)<br>Basement (dummy)<br>Hobby room (dummy)<br>Storage room (dummy)<br>Hallway (dummy)<br>Corridor (dummy)<br>Elevator (dummy)<br>Private garage (dummy)<br>Collective garage (dummy)                                                                                                                                                                                                                                                                                                                                         | $\begin{array}{c} 64.86\\ 0.90\\ 0.11\\ 0.41\\ 0.01\\ 0.71\\ 0.00\\ 0.01\\ 0.57\\ 0.15\\ 0.88\\ 0.23\\ 0.22\\ 0.01\\ \end{array}$                                                                                      | $\begin{array}{c} 26.70\\ 0.30\\ 0.32\\ 0.49\\ 0.12\\ 0.45\\ 0.03\\ 0.10\\ 0.50\\ 0.36\\ 0.33\\ 0.42\\ 0.41\\ 0.10\\ \end{array}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 63.70<br>0.90<br>0.11<br>0.44<br>0.01<br>0.72<br>0.00<br>0.01<br>0.55<br>0.88<br>0.22<br>0.22<br>0.01                                                                                                                | $\begin{array}{c} 26.16\\ 0.30\\ 0.31\\ 0.50\\ 0.12\\ 0.45\\ 0.00\\ 0.10\\ 0.49\\ 0.36\\ 0.32\\ 0.42\\ 0.42\\ 0.42\\ 0.41\\ 0.11\\ \end{array}$                                                                                                                                                                 | $\begin{array}{c} -0.03\\ -1.15\\ 0.00\\ -0.01\\ 0.03\\ 0.00\\ 0.01\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ -0.01\\ 0.00\\ 0.00\\ 0.00\\ \end{array}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.005<br>0.715<br>0.489<br>0.009<br>0.995<br>0.215<br>0.005<br>0.990<br>0.362<br>0.685<br>0.571<br>0.571<br>0.571<br>0.640<br>0.269                    |
| Location quality         Basic         4675         45.8         1010         45.1           Good         2318         22.7         481         21.5           Intermediate         3018         29.6         706         31.5           Type of Apartment         Very Good         193         1.9         42         1.9           Type of Apartment         189         1.9         34         1.5           Floor Apartment         189         1.9         34         1.5           Floor Apartment         9384         92.0         2062         92.1           Loft         2         0.0         0         0.0           Penthouse         5         0.0         0         0.0           Storefront Apartment         28         0.3         3         0.1           Floor level         Basement floor         52         0.5         4         0.2           First floor         2274         22.3         409         18.3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Bathroom (dummy)<br>Separate WC (dummy)<br>Balcony (dummy)<br>Attic (dummy)<br>Basement (dummy)<br>Hobby room (dummy)<br>Storage room (dummy)<br>Hallway (dummy)<br>Corridor (dummy)<br>Elevator (dummy)<br>Private garage (dummy)<br>Collective garage (dummy)<br>Parking lot (dummy)                                                                                                                                                                                                                                                                                                                  | $\begin{array}{c} 64.86\\ 0.90\\ 0.11\\ 0.41\\ 0.01\\ 0.71\\ 0.00\\ 0.01\\ 0.57\\ 0.15\\ 0.88\\ 0.23\\ 0.22\\ 0.01\\ 0.06\end{array}$                                                                                  | $\begin{array}{c} 26.70\\ 0.30\\ 0.32\\ 0.49\\ 0.12\\ 0.45\\ 0.03\\ 0.10\\ 0.50\\ 0.36\\ 0.33\\ 0.42\\ 0.41\\ 0.10\\ 0.23\end{array}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 63.70<br>0.90<br>0.11<br>0.44<br>0.01<br>0.72<br>0.00<br>0.01<br>0.58<br>0.15<br>0.88<br>0.22<br>0.22<br>0.22<br>0.01<br>0.05                                                                                        | $\begin{array}{c} 26.16\\ 0.30\\ 0.31\\ 0.50\\ 0.12\\ 0.45\\ 0.00\\ 0.10\\ 0.49\\ 0.36\\ 0.32\\ 0.42\\ 0.42\\ 0.42\\ 0.11\\ 0.23\\ \end{array}$                                                                                                                                                                 | $\begin{array}{c} -0.03\\ -1.15\\ 0.00\\ -0.01\\ 0.03\\ 0.00\\ 0.01\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ -0.01\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0$ | $\begin{array}{c} 0.705\\ 0.715\\ 0.489\\ 0.009\\ 0.995\\ 0.215\\ 0.005\\ 0.990\\ 0.362\\ 0.685\\ 0.571\\ 0.640\\ 0.269\\ 0.404 \end{array}$           |
| Intermediate         3018         29.6         706         31.5           Very Good         193         1.9         42         1.9           Type of Apartment         Attic Apartment         588         5.8         138         6.2           Duplex Apartment         189         1.9         34         1.5           Floor Apartment         9384         92.0         2062         92.1           Loft         2         0.0         0         0.0           Penthouse         5         0.0         0         0.0           Storefront Apartment         28         0.3         3         0.1           Terrace Apartment         8         0.1         2         0.1           Floor level         Basement floor         52         0.5         4         0.2           First floor         2274         22.3         409         18.3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Bathroom (dummy)<br>Separate WC (dummy)<br>Balcony (dummy)<br>Attic (dummy)<br>Basement (dummy)<br>Atelier (dummy)<br>Hobby room (dummy)<br>Storage room (dummy)<br>Hallway (dummy)<br>Corridor (dummy)<br>Elevator (dummy)<br>Private garage (dummy)<br>Private garage (dummy)<br>Parking lot (dummy)                                                                                                                                                                                                                                                                                                  | 64.86<br>0.90<br>0.11<br>0.41<br>0.01<br>0.71<br>0.00<br>0.01<br>0.57<br>0.15<br>0.88<br>0.23<br>0.22<br>0.01<br>0.06<br>N                                                                                             | 26.70<br>0.30<br>0.32<br>0.49<br>0.12<br>0.45<br>0.03<br>0.10<br>0.50<br>0.36<br>0.33<br>0.42<br>0.41<br>0.10<br>0.23<br>Pct.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 63.70<br>0.90<br>0.11<br>0.44<br>0.01<br>0.72<br>0.00<br>0.01<br>0.58<br>0.15<br>0.88<br>0.22<br>0.22<br>0.01<br>0.05                                                                                                | 26.16<br>0.30<br>0.31<br>0.50<br>0.12<br>0.45<br>0.00<br>0.10<br>0.49<br>0.36<br>0.32<br>0.42<br>0.42<br>0.42<br>0.42<br>0.42<br>0.42                                                                                                                                                                           | $\begin{array}{c} -0.03\\ -1.15\\ 0.00\\ -0.01\\ 0.03\\ 0.00\\ 0.01\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ -0.01\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0$ | $\begin{array}{c} 0.715\\ 0.715\\ 0.489\\ 0.009\\ 0.995\\ 0.215\\ 0.005\\ 0.990\\ 0.362\\ 0.685\\ 0.571\\ 0.571\\ 0.640\\ 0.269\\ 0.404\\ \end{array}$ |
| Very Good1931.9421.9Type of ApartmentAttic Apartment5885.81386.2Duplex Apartment1891.9341.5Floor Apartment938492.0206292.1Loft20.000.0Penthouse50.000.0Storefront Apartment280.330.1Terrace Apartment80.120.1Floor levelBasement floor520.540.2First floor227422.340918.3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Bathroom (dummy)<br>Separate WC (dummy)<br>Balcony (dummy)<br>Attic (dummy)<br>Basement (dummy)<br>Atelier (dummy)<br>Hobby room (dummy)<br>Storage room (dummy)<br>Hallway (dummy)<br>Corridor (dummy)<br>Elevator (dummy)<br>Private garage (dummy)<br>Private garage (dummy)<br>Parking lot (dummy)<br>Location quality<br>Basic<br>Good                                                                                                                                                                                                                                                             | 64.86<br>0.90<br>0.11<br>0.41<br>0.01<br>0.71<br>0.00<br>0.01<br>0.57<br>0.15<br>0.88<br>0.23<br>0.22<br>0.01<br>0.06<br>N<br>4675<br>2318                                                                             | 26.70<br>0.30<br>0.32<br>0.49<br>0.12<br>0.45<br>0.03<br>0.10<br>0.50<br>0.36<br>0.33<br>0.42<br>0.41<br>0.10<br>0.23<br>Pct.<br>45.8<br>22.7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 63.70<br>0.90<br>0.11<br>0.44<br>0.01<br>0.72<br>0.00<br>0.01<br>0.58<br>0.15<br>0.88<br>0.22<br>0.22<br>0.01<br>0.05<br>N<br>1010<br>481                                                                            | 26.16<br>0.30<br>0.31<br>0.45<br>0.00<br>0.12<br>0.45<br>0.00<br>0.10<br>0.49<br>0.36<br>0.32<br>0.42<br>0.42<br>0.42<br>0.42<br>0.42<br>0.42<br>0.42<br>0.4                                                                                                                                                    | $\begin{array}{c} -0.03\\ -1.15\\ 0.00\\ -0.01\\ 0.03\\ 0.00\\ 0.01\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ -0.01\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0$ | 0.715<br>0.489<br>0.009<br>0.995<br>0.215<br>0.005<br>0.990<br>0.362<br>0.685<br>0.571<br>0.571<br>0.571<br>0.571<br>0.540<br>0.269<br>0.404           |
| Type of Apartment       Attic Apartment       588       5.8       138       6.2         Duplex Apartment       189       1.9       34       1.5         Floor Apartment       9384       92.0       2062       92.1         Loft       2       0.0       0       0.0         Penthouse       5       0.0       0       0.0         Storefront Apartment       28       0.3       3       0.1         Terrace Apartment       8       0.1       2       0.1         Floor level       Basement floor       52       0.5       4       0.2         First floor       2274       22.3       409       18.3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Bathroom (dummy)<br>Separate WC (dummy)<br>Balcony (dummy)<br>Attic (dummy)<br>Basement (dummy)<br>Atelier (dummy)<br>Hobby room (dummy)<br>Storage room (dummy)<br>Hallway (dummy)<br>Corridor (dummy)<br>Elevator (dummy)<br>Private garage (dummy)<br>Private garage (dummy)<br>Collective garage (dummy)<br>Parking lot (dummy)<br>Location quality<br>Location quality<br>Basic<br>Good<br>Intermediate                                                                                                                                                                                            | 64.86<br>0.90<br>0.11<br>0.41<br>0.01<br>0.71<br>0.00<br>0.01<br>0.57<br>0.15<br>0.88<br>0.23<br>0.22<br>0.01<br>0.06<br>N<br>4675<br>2318<br>3018                                                                     | 26.70<br>0.30<br>0.32<br>0.49<br>0.12<br>0.45<br>0.03<br>0.10<br>0.50<br>0.36<br>0.33<br>0.42<br>0.41<br>0.10<br>0.23<br>Pct.<br>45.8<br>22.7<br>29.6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 63.70<br>0.90<br>0.11<br>0.44<br>0.01<br>0.72<br>0.00<br>0.01<br>0.58<br>0.15<br>0.88<br>0.22<br>0.22<br>0.01<br>0.05<br>N<br>1010<br>481<br>706                                                                     | 26.16<br>0.30<br>0.31<br>0.45<br>0.00<br>0.12<br>0.45<br>0.00<br>0.10<br>0.49<br>0.36<br>0.32<br>0.42<br>0.42<br>0.42<br>0.42<br>0.42<br>0.42<br>0.42<br>0.4                                                                                                                                                    | $\begin{array}{c} -0.03\\ -1.15\\ 0.00\\ -0.01\\ 0.03\\ 0.00\\ 0.01\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ -0.01\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ \end{array}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.715<br>0.489<br>0.009<br>0.9215<br>0.005<br>0.990<br>0.362<br>0.685<br>0.571<br>0.571<br>0.640<br>0.269<br>0.404                                     |
| Floor Apartment       934       92.0       2062       92.1         Loft       2       0.0       0       0.0         Penthouse       5       0.0       0       0.0         Storefront Apartment       28       0.3       3       0.1         Terrace Apartment       8       0.1       2       0.1         Floor level       Basement floor       52       0.5       4       0.2         First floor       2274       22.3       409       18.3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Bathroom (dummy)<br>Separate WC (dummy)<br>Balcony (dummy)<br>Attic (dummy)<br>Basement (dummy)<br>Atelier (dummy)<br>Hobby room (dummy)<br>Storage room (dummy)<br>Hallway (dummy)<br>Corridor (dummy)<br>Elevator (dummy)<br>Elevator (dummy)<br>Private garage (dummy)<br>Collective garage (dummy)<br>Parking lot (dummy)<br>Location quality<br>Basic<br>Good<br>Intermediate<br>Very Good                                                                                                                                                                                                         | 64.86<br>0.90<br>0.11<br>0.41<br>0.01<br>0.71<br>0.00<br>0.01<br>0.57<br>0.15<br>0.88<br>0.23<br>0.22<br>0.01<br>0.06<br>N<br>4675<br>2318<br>3018<br>193                                                              | 26.70<br>0.30<br>0.32<br>0.49<br>0.12<br>0.45<br>0.03<br>0.10<br>0.50<br>0.36<br>0.33<br>0.42<br>0.41<br>0.10<br>0.23<br>Pct.<br>45.8<br>22.7<br>29.6<br>1.9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 63.70<br>0.90<br>0.11<br>0.44<br>0.01<br>0.72<br>0.00<br>0.01<br>0.58<br>0.15<br>0.88<br>0.22<br>0.01<br>0.05<br>N<br>1010<br>481<br>706<br>42                                                                       | 26.16<br>0.30<br>0.31<br>0.45<br>0.00<br>0.12<br>0.45<br>0.00<br>0.10<br>0.49<br>0.36<br>0.32<br>0.42<br>0.42<br>0.42<br>0.42<br>0.42<br>0.42<br>0.42<br>0.4                                                                                                                                                    | $\begin{array}{c} -0.03 \\ -1.15 \\ 0.00 \\ -0.01 \\ 0.03 \\ 0.00 \\ 0.01 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\$                                                 | 0.715<br>0.715<br>0.489<br>0.009<br>0.9215<br>0.0215<br>0.005<br>0.3625<br>0.571<br>0.571<br>0.640<br>0.269<br>0.404                                   |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Bathroom (dummy)<br>Separate WC (dummy)<br>Balcony (dummy)<br>Attic (dummy)<br>Basement (dummy)<br>Atelier (dummy)<br>Hobby room (dummy)<br>Storage room (dummy)<br>Hallway (dummy)<br>Corridor (dummy)<br>Elevator (dummy)<br>Elevator (dummy)<br>Private garage (dummy)<br>Collective garage (dummy)<br>Parking lot (dummy)<br>Location quality<br>Location quality<br>Location quality<br>Type of Apartment<br>Type of Apartment<br>Dunlaw Apartment                                                                                                                                                 | 64.86<br>0.90<br>0.11<br>0.41<br>0.01<br>0.71<br>0.00<br>0.01<br>0.57<br>0.15<br>0.88<br>0.23<br>0.23<br>0.22<br>0.01<br>0.06<br>N<br>4675<br>2318<br>3018<br>193<br>588                                               | 26.70<br>0.30<br>0.32<br>0.49<br>0.12<br>0.45<br>0.03<br>0.03<br>0.33<br>0.42<br>0.41<br>0.10<br>0.23<br>Pct.<br>45.8<br>22.7<br>29.6<br>1.9<br>5.8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 63.70<br>0.90<br>0.11<br>0.44<br>0.01<br>0.72<br>0.00<br>0.01<br>0.58<br>0.15<br>0.88<br>0.22<br>0.22<br>0.01<br>0.05<br>N<br>1010<br>481<br>706<br>42<br>138<br>24                                                  | 26.16<br>0.30<br>0.31<br>0.45<br>0.00<br>0.12<br>0.45<br>0.00<br>0.10<br>0.49<br>0.36<br>0.32<br>0.42<br>0.42<br>0.42<br>0.42<br>0.42<br>0.42<br>0.42<br>0.4                                                                                                                                                    | $\begin{array}{c} -0.03 \\ -1.15 \\ 0.00 \\ -0.01 \\ 0.03 \\ 0.00 \\ 0.01 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\$                                                 | 0.715<br>0.715<br>0.489<br>0.009<br>0.990<br>0.215<br>0.005<br>0.990<br>0.362<br>0.685<br>0.571<br>0.571<br>0.640<br>0.269<br>0.404                    |
| Penthouse         5         0.0         0         0.0           Storefront Apartment         28         0.3         3         0.1           Terrace Apartment         8         0.1         2         0.1           Floor level         Basement floor         52         0.5         4         0.2           First floor         2274         22.3         409         18.3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Bathroom (dummy)<br>Separate WC (dummy)<br>Balcony (dummy)<br>Attiic (dummy)<br>Basement (dummy)<br>Hobby room (dummy)<br>Hobby room (dummy)<br>Storage room (dummy)<br>Corridor (dummy)<br>Elevator (dummy)<br>Corridor (dummy)<br>Elevator (dummy)<br>Private garage (dummy)<br>Private garage (dummy)<br>Parking lot (dummy)<br>Location quality<br>Location quality<br>Elevator (dummy)<br>Defective garage (dummy)<br>Parking lot (dummy)<br>Location quality<br>Type of Apartment<br>Type of Apartment<br>Floor Apartment                                                                         | 64.86<br>0.90<br>0.11<br>0.41<br>0.01<br>0.71<br>0.00<br>0.01<br>0.57<br>0.15<br>0.88<br>0.23<br>0.23<br>0.22<br>0.01<br>0.06<br>N<br>4675<br>2318<br>3018<br>193<br>588<br>189<br>9384                                | 26.70<br>0.30<br>0.32<br>0.49<br>0.12<br>0.45<br>0.03<br>0.10<br>0.50<br>0.36<br>0.33<br>0.42<br>0.41<br>0.10<br>0.23<br>Pct.<br>45.8<br>22.7<br>29.6<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>9.2.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 63.70<br>0.90<br>0.11<br>0.44<br>0.01<br>0.72<br>0.00<br>0.01<br>0.58<br>0.15<br>0.88<br>0.22<br>0.22<br>0.22<br>0.01<br>0.05<br>N<br>1010<br>481<br>706<br>42<br>138<br>34<br>2062                                  | 26.16<br>0.30<br>0.31<br>0.50<br>0.12<br>0.45<br>0.00<br>0.10<br>0.49<br>0.36<br>0.32<br>0.42<br>0.42<br>0.42<br>0.42<br>0.42<br>0.42<br>0.42<br>0.4                                                                                                                                                            | $\begin{array}{c} -0.03 \\ -1.15 \\ 0.00 \\ -0.01 \\ 0.03 \\ 0.00 \\ 0.01 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\$                                                 | 0.715<br>0.715<br>0.489<br>0.009<br>0.9215<br>0.005<br>0.990<br>0.3685<br>0.571<br>0.571<br>0.640<br>0.269<br>0.404                                    |
| Storerront Apartment         28         0.3         3         0.1           Terrace Apartment         8         0.1         2         0.1           Floor level         Basement floor         52         0.5         4         0.2           First floor         2274         22.3         409         18.3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Bathroom (dummy)<br>Separate WC (dummy)<br>Balcony (dummy)<br>Attiic (dummy)<br>Basement (dummy)<br>Hobby room (dummy)<br>Hobby room (dummy)<br>Storage room (dummy)<br>Corridor (dummy)<br>Elevator (dummy)<br>Elevator (dummy)<br>Private garage (dummy)<br>Parking lot (dummy)<br>Parking lot (dummy)<br>Location quality<br>Location quality<br>Type of Apartment<br>Type of Apartment<br>Floor Apartment<br>Loft                                                                                                                                                                                   | 64.86<br>0,90<br>0.11<br>0.41<br>0.01<br>0.57<br>0.15<br>0.88<br>0.23<br>0.22<br>0.01<br>0.06<br>N<br>4675<br>2318<br>3018<br>193<br>588<br>189<br>9384<br>2                                                           | $\begin{array}{c} 26.70\\ 0.30\\ 0.32\\ 0.49\\ 0.12\\ 0.45\\ 0.03\\ 0.10\\ 0.50\\ 0.36\\ 0.33\\ 0.42\\ 0.41\\ 0.10\\ 0.23\\ \hline Pct.\\ 45.8\\ 22.7\\ 29.6\\ 1.9\\ 5.8\\ 1.9\\ 92.0\\ 0.0\\ \hline \end{array}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 63.70<br>0.90<br>0.11<br>0.44<br>0.01<br>0.72<br>0.00<br>0.01<br>0.58<br>0.15<br>0.88<br>0.22<br>0.22<br>0.22<br>0.01<br>0.05<br>N<br>1010<br>481<br>706<br>42<br>138<br>34<br>2062<br>0<br>0                        | $\begin{array}{c} 26.16\\ 0.30\\ 0.31\\ 0.50\\ 0.12\\ 0.45\\ 0.00\\ 0.10\\ 0.49\\ 0.36\\ 0.32\\ 0.42\\ 0.42\\ 0.42\\ 0.42\\ 0.42\\ 0.42\\ 0.11\\ 0.23\\ \hline Pct.\\ 45.1\\ 21.5\\ 31.5\\ 31.5\\ 31.5\\ 31.5\\ 31.5\\ 31.5\\ 31.5\\ 31.5\\ 0.23\\ \hline \end{array}$                                          | $\begin{array}{c} -0.03 \\ -1.03 \\ 0.00 \\ -0.01 \\ 0.03 \\ 0.00 \\ 0.01 \\ 0.00 \\ 0.00 \\ 0.01 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\$                                                 | 0.715<br>0.715<br>0.489<br>0.009<br>0.9215<br>0.005<br>0.990<br>0.3685<br>0.571<br>0.571<br>0.571<br>0.642<br>0.269<br>0.404                           |
| Floor level Basement floor 52 0.5 4 0.2<br>First floor 2274 22.3 409 18.3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Bathroom (dummy)<br>Separate WC (dummy)<br>Balcony (dummy)<br>Attic (dummy)<br>Basement (dummy)<br>Hobby room (dummy)<br>Hobby room (dummy)<br>Storage room (dummy)<br>Corridor (dummy)<br>Elevator (dummy)<br>Elevator (dummy)<br>Private garage (dummy)<br>Parking lot (dummy)<br>Location quality<br>Location quality<br>Elevator (dummy)<br>Defective garage (dummy)<br>Parking lot (dummy)<br>Location quality<br>Type of Apartment<br>Type of Apartment<br>Floor Apartment<br>Loft<br>Penthouse                                                                                                   | 64.86<br>0.90<br>0.11<br>0.41<br>0.01<br>0.71<br>0.00<br>0.01<br>0.57<br>0.15<br>0.88<br>0.23<br>0.22<br>0.01<br>0.06<br>N<br>4675<br>2318<br>3018<br>193<br>588<br>189<br>9384<br>2<br>5<br>5                         | $\begin{array}{c} 26.70\\ 0.30\\ 0.32\\ 0.49\\ 0.12\\ 0.45\\ 0.03\\ 0.10\\ 0.50\\ 0.36\\ 0.33\\ 0.42\\ 0.41\\ 0.10\\ 0.23\\ \end{array}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 63.70<br>0.90<br>0.11<br>0.44<br>0.01<br>0.72<br>0.00<br>0.01<br>0.58<br>0.15<br>0.88<br>0.22<br>0.22<br>0.22<br>0.22<br>0.22<br>0.22<br>0.22                                                                        | $\begin{array}{c} 26.16\\ 0.30\\ 0.31\\ 0.50\\ 0.012\\ 0.45\\ 0.00\\ 0.12\\ 0.45\\ 0.00\\ 0.10\\ 0.49\\ 0.36\\ 0.32\\ 0.42\\ 0.42\\ 0.42\\ 0.42\\ 0.42\\ 0.11\\ 0.23\\ \hline Pct.\\ 45.1\\ 21.5\\ 31.5\\ 31.5\\ 1.9\\ 6.2\\ 1.5\\ 92.1\\ 1.9\\ 6.2\\ 1.5\\ 92.1\\ 0.0\\ 0.0\\ 0.0\\ 0.0\\ 0.0\\ 0.0\\ 0.0\\ 0$ | -0.05<br>-1.15<br>0.00<br>-0.01<br>0.03<br>0.00<br>0.01<br>0.00<br>0.00<br>0.00<br>0.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0.715<br>0.715<br>0.489<br>0.009<br>0.9215<br>0.005<br>0.990<br>0.3685<br>0.571<br>0.571<br>0.571<br>0.6485<br>0.2571<br>0.571                         |
| First floor 2274 22.3 409 18.3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Bathroom (dummy)<br>Separate WC (dummy)<br>Balcony (dummy)<br>Attic (dummy)<br>Atselier (dummy)<br>Hobby room (dummy)<br>Storage room (dummy)<br>Hallway (dummy)<br>Corridor (dummy)<br>Elevator (dummy)<br>Private garage (dummy)<br>Parking lot (dummy)<br>Delective garage (dummy)<br>Parking lot (dummy)<br>Location quality<br>Location quality<br>Type of Apartment<br>Type of Apartment<br>Floor Apartment<br>Eloor Apartment<br>Floor Apartment<br>Corridor (dummy)                                                                                                                             | 64.86<br>0.90<br>0.11<br>0.41<br>0.01<br>0.71<br>0.00<br>0.01<br>0.57<br>0.15<br>0.88<br>0.23<br>0.22<br>0.01<br>0.06<br>N<br>4675<br>2318<br>3018<br>193<br>588<br>189<br>9384<br>2<br>5<br>88<br>8                   | 26.70<br>0.30<br>0.32<br>0.49<br>0.12<br>0.45<br>0.03<br>0.10<br>0.50<br>0.36<br>0.33<br>0.42<br>0.41<br>0.10<br>0.23<br>Pct.<br>45.8<br>22.7<br>29.6<br>1.9<br>5.8<br>1.9<br>92.0<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 63.70<br>0.90<br>0.11<br>0.44<br>0.01<br>0.72<br>0.00<br>0.01<br>0.58<br>0.15<br>0.88<br>0.22<br>0.22<br>0.22<br>0.22<br>0.01<br>0.05<br>N<br>1010<br>481<br>706<br>42<br>138<br>34<br>2060<br>0<br>0<br>0<br>3<br>2 | $\begin{array}{c} 26.16\\ 0.30\\ 0.31\\ 0.50\\ 0.12\\ 0.45\\ 0.00\\ 0.10\\ 0.49\\ 0.36\\ 0.32\\ 0.42\\ 0.42\\ 0.42\\ 0.42\\ 0.42\\ 0.41\\ 0.23\\ \hline Pct.\\ 45.1\\ 21.5\\ 31.5\\ 1.9\\ 6.2\\ 1.5\\ 92.1\\ 1.9\\ 6.2\\ 1.5\\ 92.1\\ 0.0\\ 0.0\\ 0.0\\ 0.1\\ 0.1\\ 0.1\\ 0.1\\ 0$                              | -0.05<br>-1.15<br>0.00<br>-0.01<br>0.03<br>0.00<br>0.01<br>0.00<br>0.00<br>0.00<br>0.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0.715<br>0.715<br>0.489<br>0.009<br>0.9215<br>0.005<br>0.990<br>0.3685<br>0.571<br>0.571<br>0.571<br>0.571<br>0.648<br>0.269<br>0.404                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Bathroom (dummy)<br>Separate WC (dummy)<br>Balcony (dummy)<br>Attic (dummy)<br>Attic (dummy)<br>Basement (dummy)<br>Atelier (dummy)<br>Hobby room (dummy)<br>Storage room (dummy)<br>Hallway (dummy)<br>Corridor (dummy)<br>Elevator (dummy)<br>Private garage (dummy)<br>Parking lot (dummy)<br>Parking lot (dummy)<br>Location quality<br>Location quality<br>Type of Apartment<br>Type of Apartment<br>Floor level<br>Basic<br>Good<br>Intermediate<br>Very Good<br>Attic Apartment<br>Floor level<br>Basic<br>Good<br>Intermediate<br>Very Good<br>Attic Apartment<br>Floor level<br>Basement floor | 64.86<br>0.90<br>0.11<br>0.41<br>0.01<br>0.71<br>0.00<br>0.01<br>0.57<br>0.15<br>0.88<br>0.23<br>0.22<br>0.01<br>0.06<br>N<br>4675<br>2318<br>3018<br>193<br>588<br>189<br>9384<br>2<br>5<br>28<br>8<br>52             | 26.70<br>0.30<br>0.32<br>0.49<br>0.12<br>0.45<br>0.03<br>0.10<br>0.50<br>0.36<br>0.33<br>0.42<br>0.41<br>0.10<br>0.23<br>Pct.<br>45.8<br>22.7<br>29.6<br>1.9<br>5.8<br>1.9<br>92.0<br>0.0<br>0.0<br>0.3<br>1.9<br>5.8<br>1.9<br>92.0<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 63.70<br>0.90<br>0.11<br>0.44<br>0.01<br>0.72<br>0.00<br>0.01<br>0.58<br>0.22<br>0.22<br>0.22<br>0.22<br>0.22<br>0.22<br>0.22<br>0.2                                                                                 | $\begin{array}{c} 26.16\\ 0.30\\ 0.31\\ 0.50\\ 0.12\\ 0.45\\ 0.00\\ 0.10\\ 0.49\\ 0.36\\ 0.32\\ 0.42\\ 0.42\\ 0.42\\ 0.42\\ 0.42\\ 0.41\\ 0.23\\ \hline Pct.\\ 45.1\\ 21.5\\ 31.5\\ 1.9\\ 6.2\\ 1.5\\ 92.1\\ 0.0\\ 0.0\\ 0.0\\ 0.1\\ 0.1\\ 0.1\\ 0.1\\ 0$                                                       | -0.03<br>-1.15<br>0.00<br>-0.01<br>0.03<br>0.00<br>0.01<br>0.00<br>0.00<br>0.00<br>0.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0.715<br>0.715<br>0.489<br>0.009<br>0.995<br>0.215<br>0.005<br>0.362<br>0.685<br>0.571<br>0.640<br>0.269<br>0.404                                      |
| Mezzanine hoor 9/ 1.0 16 0./<br>Unper floors 7781 76.3 1810 80.8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Bathroom (dummy)<br>Separate WC (dummy)<br>Balcony (dummy)<br>Attic (dummy)<br>Attic (dummy)<br>Atelier (dummy)<br>Hobby room (dummy)<br>Storage room (dummy)<br>Hallway (dummy)<br>Corridor (dummy)<br>Elevator (dummy)<br>Private garage (dummy)<br>Parking lot (dummy)<br>Parking lot (dummy)<br>Location quality<br>Location quality<br>Type of Apartment<br>Type of Apartment<br>Floor level<br>Floor level<br>Floor level                                                                                                                                                                         | 64.86<br>0.90<br>0.11<br>0.41<br>0.01<br>0.71<br>0.00<br>0.01<br>0.57<br>0.15<br>0.88<br>0.23<br>0.22<br>0.01<br>0.06<br>N<br>4675<br>2318<br>3018<br>193<br>588<br>189<br>9384<br>2<br>5<br>5<br>8<br>8<br>52<br>2274 | 26.70<br>0.30<br>0.32<br>0.49<br>0.12<br>0.45<br>0.03<br>0.10<br>0.50<br>0.36<br>0.33<br>0.42<br>0.41<br>0.10<br>0.23<br>Pct.<br>45.8<br>22.7<br>29.6<br>1.9<br>5.8<br>1.9<br>92.0<br>0.0<br>0.0<br>0.0<br>0.3<br>1.9<br>5.8<br>1.9<br>92.0<br>0.0<br>0.0<br>0.5<br>1.9<br>5.8<br>1.9<br>92.0<br>0.0<br>0.0<br>0.0<br>0.3<br>0.10<br>0.23<br>0.24<br>0.33<br>0.42<br>0.41<br>0.12<br>0.45<br>0.33<br>0.42<br>0.41<br>0.12<br>0.45<br>0.33<br>0.42<br>0.41<br>0.12<br>0.45<br>0.33<br>0.42<br>0.41<br>0.10<br>0.23<br>0.42<br>0.41<br>0.10<br>0.23<br>0.26<br>0.33<br>0.42<br>0.41<br>0.10<br>0.23<br>0.26<br>0.33<br>0.42<br>0.41<br>0.10<br>0.23<br>0.26<br>0.33<br>0.42<br>0.41<br>0.10<br>0.23<br>0.26<br>0.36<br>0.33<br>0.42<br>0.41<br>0.10<br>0.23<br>0.25<br>0.35<br>0.35<br>0.33<br>0.42<br>0.41<br>0.10<br>0.23<br>0.42<br>0.41<br>0.58<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.2<br>5.8<br>1.9<br>5.2<br>5.8<br>1.9<br>5.2<br>5.8<br>1.9<br>5.2<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5.8<br>1.9<br>5 | 63.70<br>0.90<br>0.11<br>0.44<br>0.01<br>0.72<br>0.00<br>0.01<br>0.58<br>0.22<br>0.22<br>0.22<br>0.22<br>0.22<br>0.22<br>0.22<br>0.2                                                                                 | $\begin{array}{c} 26.16\\ 0.30\\ 0.31\\ 0.50\\ 0.12\\ 0.45\\ 0.00\\ 0.10\\ 0.49\\ 0.36\\ 0.32\\ 0.42\\ 0.42\\ 0.42\\ 0.42\\ 0.42\\ 0.42\\ 0.42\\ 0.42\\ 0.11\\ 0.23\\ \hline \begin{array}{c} \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\$                                                         | -0.03<br>-1.15<br>0.00<br>-0.01<br>0.03<br>0.00<br>0.01<br>0.00<br>0.00<br>0.00<br>0.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0.715<br>0.489<br>0.009<br>0.995<br>0.215<br>0.005<br>0.362<br>0.685<br>0.571<br>0.640<br>0.269<br>0.404                                               |

The table reports descriptive statistics on Control (upper panel) and Treatment (lower panel) apartments in the double repeat sales and triple repeat sales analysis (see Section 5.2). With regard to the double repeat sales data, we have combined Treatment 1 and Treatment 2 apartments into "Treatment" in this table. It appears that the hedonic characteristics of the apartments in the treatment and control regimes do not differ in both the double and triple repeat sales analyses (apart from expected differences such as the age of the building). <u>Sources:</u> Expert Committee for Property Values in Berlin; authors' calculations.