S1. Geographically and temporally weighted regression

In order to model spatial heterogeneity, Brunsdon et al. (1996) developed a geographically weighted regression (GWR). Basic GWR has been modified in many aspects including the consideration of time (Huang et al., 2010). Specifically, the geographically and temporally weighted regression (GTWR) can be expressed through the following equation:

\[ Y_i = \beta_0(u_i, v_i, t_i) + \sum_k \beta_k(u_i, v_i, t_i)x_{ik} + \epsilon_i \]  

(S1)

where \( Y_i \) is the dependent variable, \((u_i, v_i, t_i)\) represents geographic and temporal coordinates of the location \( i \), \( \beta_0(u_i, v_i, t_i) \) denotes the intercept at location \( i \), \( \beta_k(u_i, v_i, t_i) \) is a matrix of parameters at location \( i \), \( x_{ik} \) refers to the vector of regressors, and \( \epsilon_i \) denotes the error term.

The estimation of the GTWR model parameters can be expressed as follows:

\[
\hat{\beta}(u_i, v_i, t_i) = (X^T W(u_i, v_i, t_i) X)^{-1} X^T W(u_i, v_i, t_i) Y
\]  

(S2)

where \( W(u_i, v_i, t_i) = \text{diag}(\alpha_{1i}, ..., \alpha_{ni}) \), whereas \( n \) denotes the number of observations. Note that the diagonal elements relate to a space-time distance function of \((u, v, t)\) corresponding to the weights while calibrating a weighted regression close to observation point \( i \). Therefore, it is essential to correctly specify the space-time distance decay function \( \alpha_{ij} \).

The model estimation depends on the proximity of point \( i \) to the other data points in space-time whereas an observation \( i \) closer in space-time receives a higher weight. The total spatiotemporal distance can be expressed as:

\[ d_{ST} = \rho d^S + \mu d^T \]  

(S3)

where \( d^S \) (\( d^T \)) refers to spatial (temporal) distance, \( \rho \) and \( \mu \) are weights to balance the relevance of \( d^S \) and \( d^T \) on \( d_{ST} \). We used the Euclidean spatiotemporal distance to construct \( d_{ST} \), and therefore equation S3 can be written as:

\[
(d_{ij}^{ST})^2 = \rho \left( (u_i - u_j)^2 + (v_i - v_j)^2 \right) + \mu (t_i - t_j)^2
\]  

(S4)

Considering the Gaussian kernel, the space-time distance decay function \( \alpha_{ij} \) is represented as:

\[
\alpha_{ij} = \exp \left[ -\frac{\rho ((u_i - u_j)^2 + (v_i - v_j)^2) + \mu (t_i - t_j)^2}{\alpha_i^2} \right]
\]  

(S5)
where $h_{ST}$ is the parameter of spatiotemporal bandwidth. To select the optimal value of $h_{ST}$, following Wu et al. (2014), we used cross-validation (CV) to minimize the sum of the squared error as follows:

$$CV(h_{ST}) = \sum_i(Y_i - \hat{Y}_i(h_{ST}))^2$$  

(S6)

where $\hat{Y}_i$ denotes the predicted value.

After determining the spatiotemporal bandwidth, the values of $\rho$ and $\mu$ need to be optimized during model calibration (Huang et al. 2010). In particular, to minimize the number of parameters, equation S4 can be written as:

$$\left(\frac{d_{ij}^S}{\rho}\right)^2 = \left[\left(u_i - u_j\right)^2 + \left(v_i - v_j\right)^2\right] + \tau(t_i - t_j)^2$$  

(S7)

where $\tau = \frac{\mu}{\rho}$ denotes the spatiotemporal ratio. Setting $\rho = 1$ in equation S7, the only parameter left to calibrate is $\tau$. For that purpose, we chose the value of $\tau$ for which the GTWR model has the smallest AIC value as done by Huang et al. (2010).

**S2. Principal component analysis**

Principal component analysis (PCA) is a multivariate technique to reduce the dimensionality of the input data. This is important when analyzing numerous variables that may be correlated with each other. PCA results in a few so-called principal components (PCs) that are linear combinations of the input data and orthogonal (and thus uncorrelated) to each other. The PCs are computed as:

$$PC_{iu} = \sum_k a_{uk}x_{ik}$$  

(S8)

where $PC_{iu}$ refers to principal component $u$ at observation $i$, $a_{ku}$ concerns parameters obtained using maximizing the explained variance of the original variables $x_{ki}$. The aim of PCA is to select a small number of PCs representing most of the information. Many criteria exist to select a suitable number of PCs. The first is to select as many PCs explaining at least 95% of the variance of the input data. The second is the Kaiser (1960) criterion, where only those PCs with an eigenvalue above 1 are selected.

**S3. REDCAP algorithm**

The REDCAP (2008) family of algorithms comprises six approaches depending on two elements: (i) hierarchical clustering procedures (i.e., single linkage clustering, average linkage clustering, or complete linkage clustering); and (ii) contiguity constrained strategies (i.e., first-order constraining or full-order constraining). The algorithm proceeds in three steps. First, a dendrogram is created using hierarchical clustering taking into account the spatial
contiguity. Second, the dendrogram is transformed into a spanning tree. Third, the spanning
tree is pruned to obtain a desired number of clusters by means of minimizing the overall
heterogeneity of attributes as follows (Mennis & Harris, 2013):

\[ H = \sum_{k=1}^{K} \sum_{j=1}^{d} \sum_{i=1}^{n_k} (x_{ij} - \bar{x}_j)^2 \]  

(S9)

where \( K \) is the number of clusters, \( d \) refers to the number of attributes, \( n_k \) represents the
number of observations in cluster \( k \), \( x_{ij} \) denotes the value \( j \)-th attribute of the \( i \)-th observation,
\( \bar{x}_j \) is the average value of the \( j \)-th attribute calculated for all observations in cluster \( k \). In order
to generate the initial spanning tree, two settings are crucial. The first concerns the clustering
procedure utilized, where the minimum distance between clusters is evaluated using either
the two closest spatial observations (i.e., single linkage), the average distance of all spatial
observations (i.e., average linkage), or the maximum distance between spatial observations
(i.e., complete linkage). The second deals with the applied spatial contiguity constraint. First-
order constraining assumes the similarity among adjacent spatial observations (clusters),
while full-order constraining assumes similarity among all spatial observations between two
clusters.

S4. Adjusted Rand index

A common index for comparing partitions is the Rand index (RI) (Rand, 1971). However, the
original RI has the limitation that the RI value approaches its upper limit with a larger number
of clusters. This issue is addressed in the adjusted Rand index (ARI) (Hubert & Arabie,
1985). The ARI was recommended for assessing the similarity of partitions with different
number of clusters (Santos & Embrechts, 2009). Briefly, the ARI is calculated as follows:

\[ ARI = \frac{\binom{n}{2}(a+d)-[(a+b)(a+c)+(c+d)(b+d)]}{\binom{n}{2}^2-[(a+b)(a+c)+(c+d)(b+d)]} \]  

(S10)

where \( n \) is the total number of objects, \( a \) denotes the number of pairs belonging to the same
cluster in partition P1 and to the same cluster in partition P2, \( b \) refers to the number of pairs
belonging to the same cluster in partition P1 and to different clusters in partition P2, \( c \) is the
number of pairs belonging to different clusters in partition P1 and to the same cluster in
partition P2, \( d \) is the number of pairs belonging to different clusters in partition P1 and to
different clusters in partition P2. The range of ARI is between \(-1\) and \(1\). A value of \(1\) refers to
identical partitions and a value close to \(0\) indicates a random distribution regardless of the
number of clusters.
Table S1. Description of the variables.

| Characteristic       | Definition                                                                 | Abbrev. | Mean   | 2020Q1 | 2020Q2 | 2020Q3 | 2020Q4 | 2021Q1 | OLS-based VIFs |
|----------------------|-----------------------------------------------------------------------------|---------|--------|--------|--------|--------|--------|--------|----------------|
| Dependent variable   | (log) Rent per 1 square meter (PLN)                                         | Y       | 3.861  | 3.856  | 3.806  | 3.758  | 3.761  |         |                |
| Structural variables | (log) Floor area (m²)                                                      | S1      | 3.913  | 3.895  | 3.878  | 3.885  | 3.891  | 3.368  |                |
|                      | Number of rooms                                                             | S2      | 2.218  | 2.215  | 2.166  | 2.170  | 2.179  | 3.196  |                |
|                      | Availability of additional space (e.g., dummies (1=yes) for garage, usable room, basement) | S4      | NA     | NA     | NA     | NA     | NA     | 1.733  |                |
|                      | (log) Age of the building in years                                         | S5      | 2.205  | 2.412  | 2.551  | 2.560  | 2.556  | 1.824  |                |
|                      | Number of floors in the building                                           | S6      | 5.215  | 5.168  | 5.055  | 4.954  | 4.839  | 1.721  |                |
|                      | Availability of elevator in the building (1=yes)                           | S7      | NA     | NA     | NA     | NA     | NA     | 1.866  |                |
| Locational variables | Distance to nearest bus stop, tram stop, or train stop (m)                 | L1      | 184.125| 181.513| 182.036| 178.920| 178.617| 1.261  |                |
|                      | Distance to city center (m)                                                | L2      | 2921.878| 2794.781| 2715.543| 2671.047| 2656.325| 3.466  |                |
|                      | (log) Distance to nearest primary or secondary road (m)                     | L3      | 5.450  | 5.313  | 5.397  | 5.436  | 5.469  | 1.164  |                |
| Neighborhood variables| (log) Distance to nearest local government building (m)                    | N1      | 6.357  | 6.301  | 6.310  | 6.268  | 6.269  | 1.898  |                |
|                      | (log) Distance to nearest work center (m)                                  | N2      | 5.241  | 5.211  | 5.236  | 5.240  | 5.218  | 1.317  |                |
|                      | (log) Distance to nearest kindergarten (m)                                 | N3      | 5.808  | 5.781  | 5.738  | 5.754  | 5.738  | 1.168  |                |
|                      | Distance to nearest school (m)                                             | N4      | 358.060| 348.308| 295.013| 327.817| 328.509| 1.392  |                |
|                      | (log) Distance to nearest university (m)                                   | N5      | 6.296  | 6.194  | 6.158  | 6.149  | 6.128  | 2.103  |                |
|                      | (log) Distance to nearest pharmacy (m)                                     | N6      | 5.555  | 5.517  | 5.484  | 5.450  | 5.450  | 1.400  |                |
|                      | Distance to nearest shopping mall (m)                                      | N7      | 1022.116| 960.028| 1002.124| 1018.790| 1017.873| 1.176  |                |
|                      | (log) Distance to nearest supermarket (m)                                  | N8      | 5.559  | 5.532  | 5.538  | 5.520  | 5.535  | 1.201  |                |
|                      | Distance to nearest forest (m)                                             | N9      | 695.592| 709.618| 714.371| 713.956| 728.892| 1.379  |                |
|                      | (log) Distance to nearest park (m)                                         | N10     | 5.512  | 5.436  | 5.413  | 5.413  | 5.416  | 1.386  |                |
|                      | Distance to nearest river or reservoir (m)                                | N11     | 488.583| 476.691| 474.639| 461.294| 462.887| 1.573  |                |
|                      | N                                                                            |         | 2298   | 2500   | 3580   | 2966   | 3268   |        |                |
### Table S2. Unstandardized parameter estimates based on the GTWR model.

| Abbrev. | Mean       | 2020Q1   | 2020Q2   | 2020Q3   | 2020Q4   | 2021Q1   |
|---------|------------|----------|----------|----------|----------|----------|
| Intercept | 5.442191  | 5.410051 | 5.512509 | 5.682523 | 5.214240 |          |
| S1      | -0.340787  | -0.338423 | -0.403825 | -0.381129 | -0.326833 |          |
| S2      | 0.086434   | 0.066850  | 0.105827  | 0.108473  | 0.083770  |          |
| S3      | -0.001169  | 0.010471  | 0.008714  | 0.005407  | 0.006815  |          |
| S4      | 0.042596   | 0.016521  | 0.018525  | 0.014939  | 0.016223  |          |
| S5      | -0.064343  | -0.070556 | -0.065669 | -0.065456 | -0.063177 |          |
| S6      | -0.005353  | -0.009529 | -0.011476 | -0.017798 | -0.015354 |          |
| S7      | 0.107650   | 0.009588  | 0.079538  | 0.136293  | 0.103844  |          |
| L1      | -0.000160  | -0.000096 | -0.000164 | -0.000137 | -0.000144 |          |
| L2      | -0.000081  | -0.000080 | -0.000063 | -0.000056 | -0.000060 |          |
| L3      | 0.013443   | 0.004646  | 0.000734  | -0.001880 | 0.007295  |          |
| N1      | 0.013228   | -0.000967 | 0.009711  | -0.021426 | 0.000121  |          |
| N2      | -0.003257  | 0.019812  | 0.007988  | 0.009160  | 0.015787  |          |
| N3      | -0.009240  | -0.013094 | -0.002591 | -0.018371 | -0.011379 |          |
| N4      | -0.000054  | 0.000010  | 0.000035  | -0.000057 | -0.000003 |          |
| N5      | -0.023927  | -0.020639 | -0.012850 | 0.000472  | -0.000862 |          |
| N6      | 0.014961   | 0.030716  | 0.008799  | 0.004723  | -0.010536 |          |
| N7      | 0.000005   | 0.000009  | 0.000008  | -0.000012 | -0.000026 |          |
| N8      | 0.013227   | 0.006479  | 0.013438  | 0.011489  | 0.017670  |          |
| N9      | 0.000090   | -0.000016 | -0.000011 | -0.000025 | 0.000050  |          |
| N10     | -0.026962  | -0.016795 | -0.026219 | -0.025616 | -0.022559 |          |
| N11     | -0.000120  | -0.000083 | -0.000078 | -0.000198 | -0.000101 |          |
Table S3. Spatial nonstationarity test results for the covariates.

| Abbrev. | 2020Q1 | 2020Q2 | 2020Q3 | 2020Q4 | 2021Q1 | 2020Q2 | 2020Q3 | 2020Q4 | 2021Q1 |
|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Intercept | -0.013 | 0.412 | 0.184 | 0.456 | 0.285 | No | Yes | Yes | Yes | Yes |
| S1 | 0.018 | 0.128 | 0.138 | 0.190 | 0.133 | Yes | Yes | Yes | Yes | Yes |
| S2 | -0.013 | 0.019 | 0.013 | 0.038 | 0.001 | No | Yes | Yes | Yes | Yes |
| S3 | -0.001 | -0.001 | 0.001 | -0.001 | 0.001 | No | No | Yes | No | Yes |
| S4 | -0.013 | 0.005 | 0.008 | 0.006 | -0.002 | No | Yes | Yes | Yes | No |
| S5 | -0.003 | -0.008 | 0.012 | -0.005 | 0.005 | No | No | Yes | No | Yes |
| S6 | -0.003 | 0.009 | -0.001 | 0.002 | 0.009 | No | Yes | No | Yes | Yes |
| S7 | -0.015 | 0.051 | 0.012 | 0.049 | -0.003 | No | Yes | Yes | No | No |
| L1 | 0.001 | -0.001 | 0.001 | -0.001 | 0.001 | Yes | Yes | Yes | Yes | Yes |
| L2 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | Yes | Yes | Yes | Yes | Yes |
| L3 | -0.003 | -0.002 | -0.001 | 0.006 | 0.002 | No | No | No | Yes | Yes |
| N1 | 0.013 | 0.010 | 0.018 | 0.034 | 0.025 | Yes | Yes | Yes | Yes | Yes |
| N2 | -0.001 | 0.002 | 0.001 | 0.001 | -0.001 | No | Yes | Yes | Yes | No |
| N3 | 0.008 | 0.034 | 0.007 | 0.018 | 0.028 | Yes | Yes | Yes | Yes | Yes |
| N4 | -0.001 | -0.001 | 0.001 | 0.001 | 0.001 | No | No | Yes | Yes | Yes |
| N5 | -0.002 | -0.005 | 0.011 | 0.002 | 0.013 | No | No | Yes | Yes | Yes |
| N6 | -0.003 | -0.006 | -0.004 | 0.008 | -0.001 | No | No | No | Yes | No |
| N7 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | Yes | Yes | Yes | Yes | Yes |
| N8 | -0.012 | 0.010 | 0.009 | -0.002 | 0.001 | No | Yes | Yes | No | Yes |
| N9 | -0.001 | -0.001 | 0.001 | 0.001 | 0.001 | No | No | Yes | Yes | Yes |
| N10 | -0.011 | -0.005 | 0.004 | -0.007 | 0.001 | No | No | Yes | No | Yes |
| N11 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | Yes | Yes | Yes | Yes | Yes |

The number of independent variables showing significant spatial nonstationarity: 7 12 18 16 17

Note: SE means standard error, OLS denotes ordinary least squares.
Table S4. Standardized parameter estimates based on the GTWR model with data without spatial outliers.

| Variable | Mean 2020Q1 | Mean 2020Q2 | Mean 2020Q3 | Mean 2020Q4 | Mean 2021Q1 | Difference of mean parameter values between 2020Q1 and 2020Q2 | Difference of mean parameter values between 2020Q3 and 2020Q4 | Difference of mean parameter values between 2021Q1 and 2021Q1 |
|----------|--------------|--------------|--------------|--------------|--------------|-------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------|
| Intercept | 5.55         | 5.58         | 5.61         | 5.62         | 5.50         | NA                                                          | NA                                                          | NA                                                          |
| Structural covariates | | | | | | | | |
| (log) Floor area | −0.57        | −0.59        | −0.62        | −0.59        | −0.57        | −0.02                                                      | −0.06                                                      | −0.02                                                      | 0.00                                                      |
| Number of rooms | 0.25          | 0.25         | 0.30         | 0.30         | 0.29         | 0.00                                                       | 0.05                                                       | 0.05                                                       | 0.04                                                      |
| Floor level | −0.10         | −0.09        | −0.07        | −0.05        | −0.05        | 0.01                                                       | 0.03                                                       | 0.05                                                       | 0.05                                                      |
| (log) Building years of the building | 0.04        | 0.04         | 0.02         | 0.02         | 0.03         | −0.01                                                      | −0.02                                                      | −0.02                                                      | −0.01                                                      |
| (log) Age of the building | −0.31        | −0.32        | −0.31        | −0.31        | −0.30        | −0.01                                                      | 0.00                                                       | 0.00                                                       | 0.01                                                      |
| Number of floors in the building | −0.07        | −0.07        | −0.08        | −0.11        | −0.11        | −0.01                                                      | −0.01                                                      | −0.04                                                      | −0.04                                                      |
| Availability of additional space, for example: garage, usable area, basement | 0.12         | 0.10         | 0.12         | 0.17         | 0.17         | −0.02                                                      | 0.00                                                       | 0.05                                                       | 0.05                                                      |
| Localational covariates | | | | | | | | |
| Distance to nearest bus stop, tram stop or train stop | −0.05 | −0.04 | −0.05 | −0.04 | −0.04 | 0.01 | 0.00 | 0.00 | 0.01 |
| Distance to city center | −0.57 | −0.57 | −0.34 | −0.39 | −0.35 | −0.01 | 0.22 | 0.18 | 0.22 |
| (log) Distance to nearest primary or secondary school | 0.04 | 0.03 | 0.02 | 0.00 | 0.00 | −0.01 | −0.04 | −0.03 |
| Neighborhood covariates | | | | | | | | |
| (log) Distance to nearest local government building | 0.05 | 0.03 | −0.01 | −0.02 | −0.01 | −0.02 | −0.06 | −0.07 | −0.07 |
| (log) Distance to nearest work center | 0.00 | 0.01 | 0.01 | 0.02 | 0.03 | 0.01 | 0.02 | 0.02 | 0.03 |
| (log) Distance to nearest kindergarten | −0.02 | −0.01 | 0.01 | −0.03 | −0.03 | 0.01 | 0.03 | −0.01 | −0.01 |
| Distance to nearest school | 0.00 | 0.03 | 0.03 | −0.03 | −0.02 | 0.03 | 0.03 | −0.03 | −0.02 |
| (log) Distance to nearest university | −0.08 | −0.09 | −0.07 | −0.03 | 0.02 | −0.01 | 0.01 | 0.05 | 0.10 |
| (log) Distance to nearest pharmacy | 0.05 | 0.05 | 0.02 | 0.01 | 0.00 | 0.00 | −0.03 | −0.04 | −0.05 |
| Distance to nearest shopping mall | 0.03 | 0.05 | 0.03 | 0.00 | −0.05 | 0.02 | 0.00 | −0.03 | −0.08 |
| (log) Distance to nearest supermarket | 0.02 | 0.01 | 0.03 | 0.03 | 0.04 | −0.01 | 0.00 | 0.01 | 0.02 |
| Distance to nearest forest | 0.01 | 0.00 | −0.03 | −0.01 | 0.02 | −0.01 | −0.04 | −0.02 | 0.01 |
| (log) Distance to nearest park | −0.03 | −0.01 | −0.02 | −0.03 | −0.04 | 0.02 | 0.01 | 0.00 | 0.00 |
| Distance to nearest river or reservoir | −0.07 | −0.03 | −0.06 | −0.15 | −0.13 | 0.04 | 0.01 | −0.07 | −0.05 |

Observations | 1144 | 1245 | 1787 | 1481 | 1628 | NA | NA | NA | NA |

Note: \( R^2 = 0.5455, \) Adjusted \( R^2 = 0.5441, \) Bandwidth = 729, Spatiotemporal ratio (\( \tau \)) = 4.10. \(^1\) The values of intercept are not standardized.
Table S5. Selection of the number of PCs.

| PC Numbers | 2020Q1 | 2020Q2 | 2020Q3 | 2020Q4 | 2021Q1 |
|------------|--------|--------|--------|--------|--------|
|            | Cumulative proportion | Cumulative proportion | Cumulative proportion | Cumulative proportion | Cumulative proportion |
| 1          | 9.23   | 0.42   | 9.94   | 0.36   | 7.08   | 0.32   | 9.10   | 0.41   |
| 2          | 5.18   | 0.66   | 3.70   | 0.54   | 4.92   | 0.55   | 4.19   | 0.60   |
| 3          | 2.92   | 0.79   | 2.57   | 0.66   | 3.17   | 0.69   | 3.14   | 0.75   |
| 4          | 1.77   | 0.87   | 1.50   | 0.74   | 2.10   | 0.79   | 1.64   | 0.82   |
| 5          | 1.14   | 0.92   | 1.33   | 0.87   | 1.48   | 0.92   | 1.48   | 0.92   |
| 6          | 0.50   | 0.94   | 0.84   | 0.94   | 0.97   | 0.90   | 0.69   | 0.92   |
| 7          | 0.36   | 0.96   | 0.68   | 0.93   | 0.72   | 0.89   | 0.90   | 0.41   |

Table S6. AIC values for the hedonic regressions.

| Number of clusters | 2020Q1 | 2020Q2 | 2020Q3 | 2020Q4 | 2021Q1 |
|-------------------|--------|--------|--------|--------|--------|
| 2                 | -294.4697 | -334.2161 | -590.7673 | -429.4719 | -404.7684 |
| 3                 | -294.5861 | -342.0114 | -615.1003 | -490.1898 | -433.9244 |
| 4                 | -386.9422 | -344.8296 | -615.1003 | -490.1898 | -433.9244 |
| 5                 | -393.3382 | -347.8275 | -615.1003 | -490.1898 | -433.9244 |
| 6                 | -391.627 | -346.0206 | -615.1003 | -490.1898 | -433.9244 |
| 7                 | -394.4823 | -355.0468 | -615.1003 | -490.1898 | -433.9244 |
| 8                 | -392.6095 | -356.4946 | -615.1003 | -490.1898 | -433.9244 |
| 9                 | -391.5156 | -354.9060 | -615.1003 | -490.1898 | -433.9244 |
| 10                | -397.7918 | -353.3163 | -615.1003 | -490.1898 | -433.9244 |
| 11                | -399.5349 | -354.1566 | -615.1003 | -490.1898 | -433.9244 |
| 12                | -396.0852 | -370.4465 | -615.1003 | -490.1898 | -433.9244 |
| 13                | -397.0055 | -369.8479 | -615.1003 | -490.1898 | -433.9244 |
| 14                | -397.4499 | -369.7372 | -615.1003 | -490.1898 | -433.9244 |
| 15                | -395.8592 | -370.3225 | -615.1003 | -490.1898 | -433.9244 |
| 16                | -395.5619 | -369.0045 | -615.1003 | -490.1898 | -433.9244 |
| 17                | -395.8170 | -367.0628 | -615.1003 | -490.1898 | -433.9244 |
| 18                | -394.1573 | -366.2570 | -615.1003 | -490.1898 | -433.9244 |
| 19                | -393.4598 | -370.0521 | -615.1003 | -490.1898 | -433.9244 |
| 20                | -393.1982 | -368.0551 | -615.1003 | -490.1898 | -433.9244 |
| 21                | -393.4598 | -370.0521 | -615.1003 | -490.1898 | -433.9244 |

Table S7. Results of the adjusted Rand index

| Period | 2020Q2 | 2020Q3 | 2020Q4 | 2021Q1 |
|--------|--------|--------|--------|--------|
| 2020Q1 | 0.74   | 0.66   | 0.75   | 0.69   |
| 2020Q2 | 0.74   | 0.77   | 0.77   | 0.79   |
| 2020Q3 | 0.66   | 0.75   | 0.75   | 0.79   |
| 2020Q4 |        |        |        |        |
Figure S1. Study area for the GTWR model with data without spatial outliers.

Figure S2. Hedonic indexes of rental prices over time.
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