Master Thesis on Intelligent Interactive Systems

Universitat Pompeu Fabra

# The Price Impact of Sustainability on Housing Prices in Barcelona

*A Multidimensional Data-Driven Approach*

## Examples of Demonstrative Maps

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# Introduction

- Five demonstrative maps are shown to display the workings of the code and the offered flexibility.

- Firstly, the purpose of the demonstrative maps and the parameters are discussed

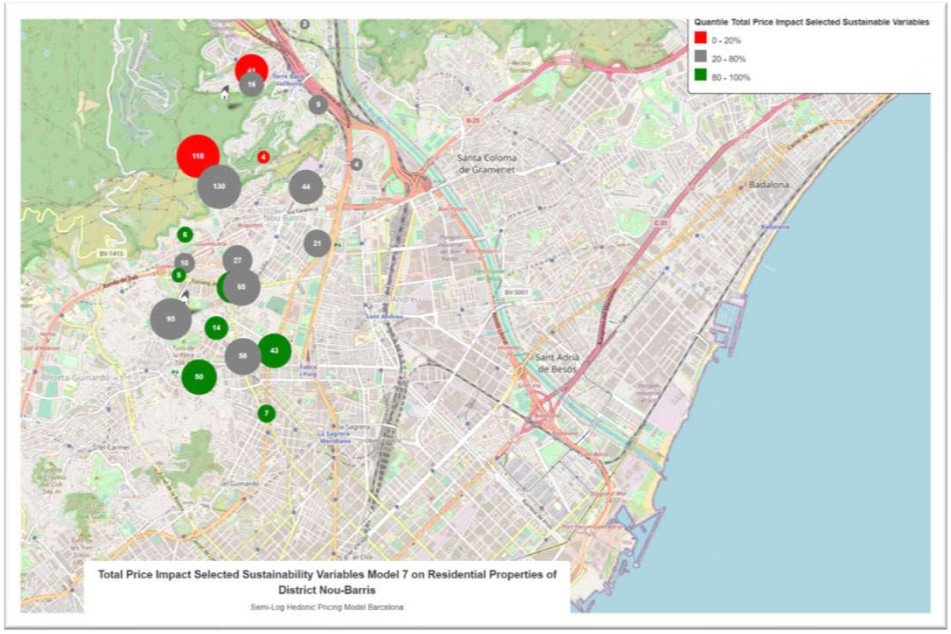
- Secondly, screenshots of the demonstrative map are shown. The screenshots include a variety of the screenshots from a high zoom level, low zoom level and shown cluster/property specific information. Therefore, it is recommended to view all the examples.

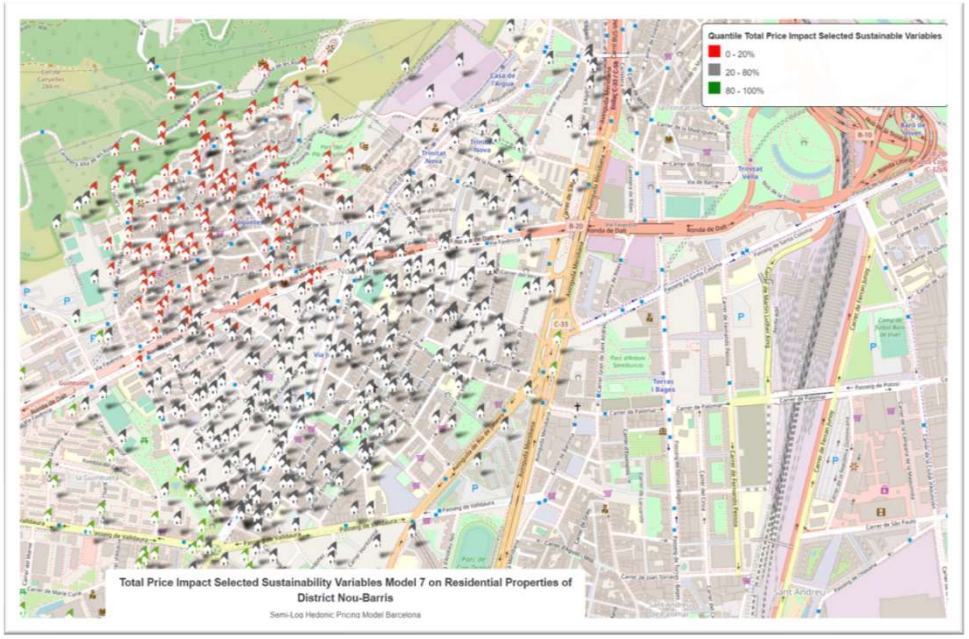
# Example 1: Purpose and parameters

The purpose of example 1 is to display information about the price impact of all sustainable variables in Model 7 on the housing prices in the subdistrict Nou-Barris.

| Parameters | Example Map 1 |
|---|---|
| Selected Sustainable Features | Sustainable_predictors |
| Map_save_name | 'slideshow_map_1' |
| Title | 'Total Price Impact Sustainability Variables Model 7 on Residential Properties in the District Nou-Barris' |
| Subtitle | "Heckman Selection Model Barcelona" |
| Legend_title | 'Quantile Total Price Impact Sustainable Variables' |
| Circle_Multiplier | 15 |
| DF | df_ols |
| Model_result | SL_ols_model_7_result |
| Color_var | "Sustainable Features Price Impact" |
| N_color_cat | 10 |
| Model_predictors | Model_7_predictors_order |
| Filter_dic | Filter_dic['filter_sign'] = 'equal to'<br>Filter_dic['filter variable'] = 'District'<br>Filter_dic[filter_value'] = 'District Nou Barris" |
| Variable_type_dic | Variable_type_predictors (specified in the notebook) |
| Ref_group_dic | Ref_group_dic (specified in the notebook) |
| N_clusters | N/A |
| Lat_col | 'latitude' |
| Long_col | 'longitude' |
| Show_all (True/False) | True |
| SVM_Cluster (True/False) | False |
| Subdistrict_Cluster (True/False) | False |
| Save (True/False) | True |

# Example 1: Screenshots



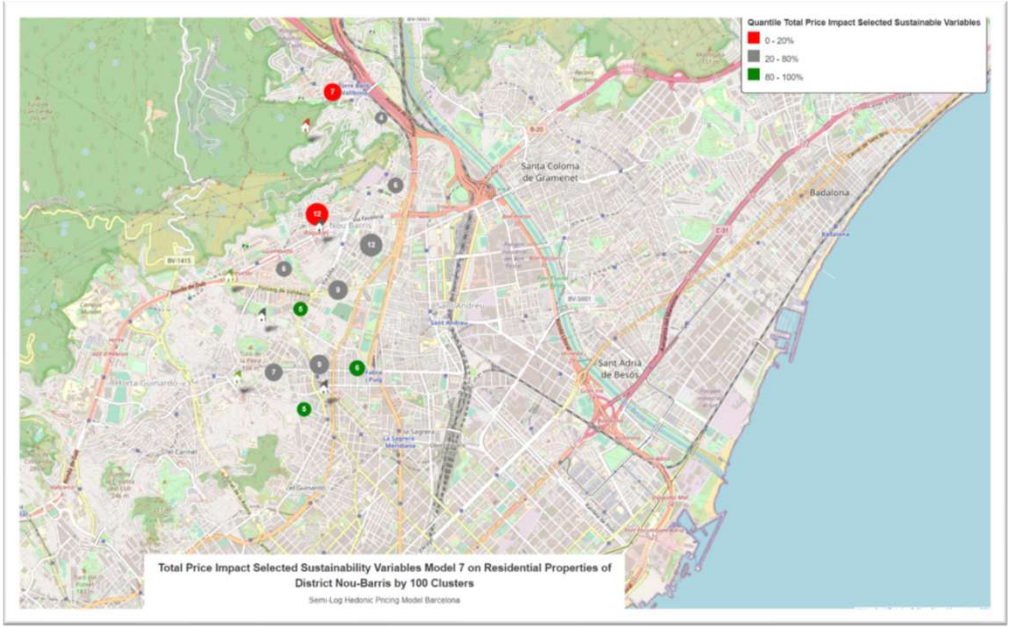

# Example 2: Purpose and parameters

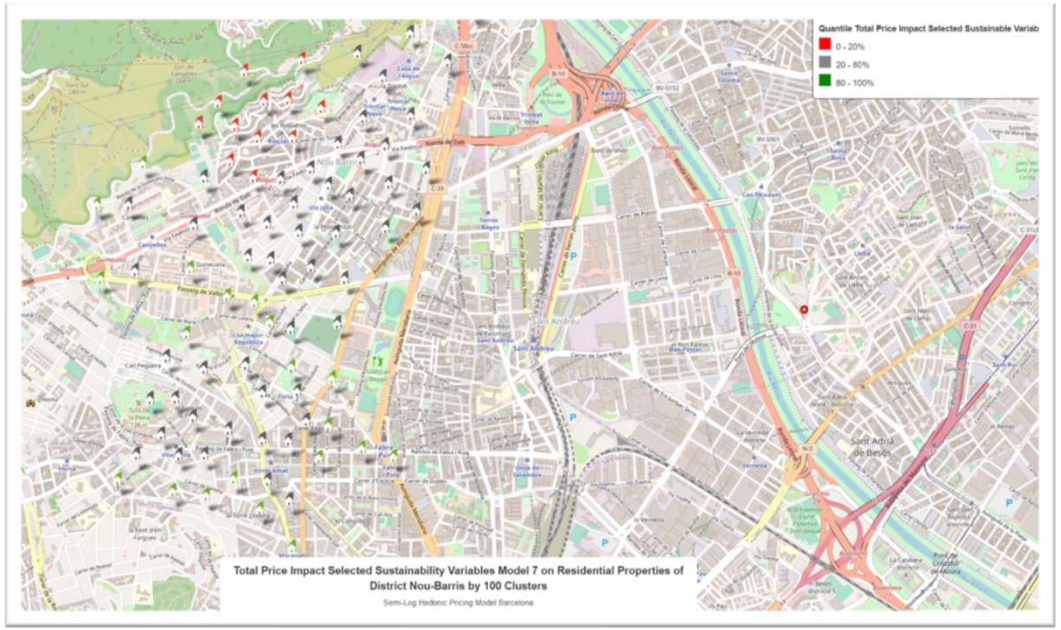
The purpose of example 2 is to display information about the price impact of all sustainable variables in Model 7 on the housing prices in the subdistrict Nou-Barris in 100 clusters.

| Parameters | Example Map 2 |
|---|---|
| Selected Sustainable Features | Sustainable_predictors |
| Map_save_name | 'slideshow_map_2' |
| Title | 'Total Price Impact Sustainability Variables Model 7 on Residential Properties in the District Nou-Barris by 100 clusters' |
| Subtitle | "Heckman Selection Model Barcelona" |
| Legend_title | 'Quantile Total Price Impact Sustainable Variables' |
| Circle_Multiplier | 15 |
| DF | df_ols |
| Model_result | SL_ols_model_7_result |
| Color_var | "Sustainable Features Price Impact" |
| N_color_cat | 5 |
| Model_predictors | Model_7_predictors_order |
| Filter_dic | Filter_dic['filter_sign'] = 'equal to'<br>Filter_dic['filter variable'] = 'District'<br>Filter_dic[filter_value'] = 'District Nou Barris" |
| Variable_type_dic | Variable_type_predictors (specified in the notebook) |
| Ref_group_dic | Ref_group_dic (specified in the notebook) |
| N_clusters | 100 |
| Lat_col | 'latitude' |
| Long_col | 'longitude' |
| Show_all (True/False) | True |
| SVM_Cluster (True/False) | True |
| Subdistrict_Cluster (True/False) | False |
| Save (True/False) | True |

# Example 2: Screenshots

Note: Less observations are shown in example 2 compared to example 1 by clustering with the support vector machine



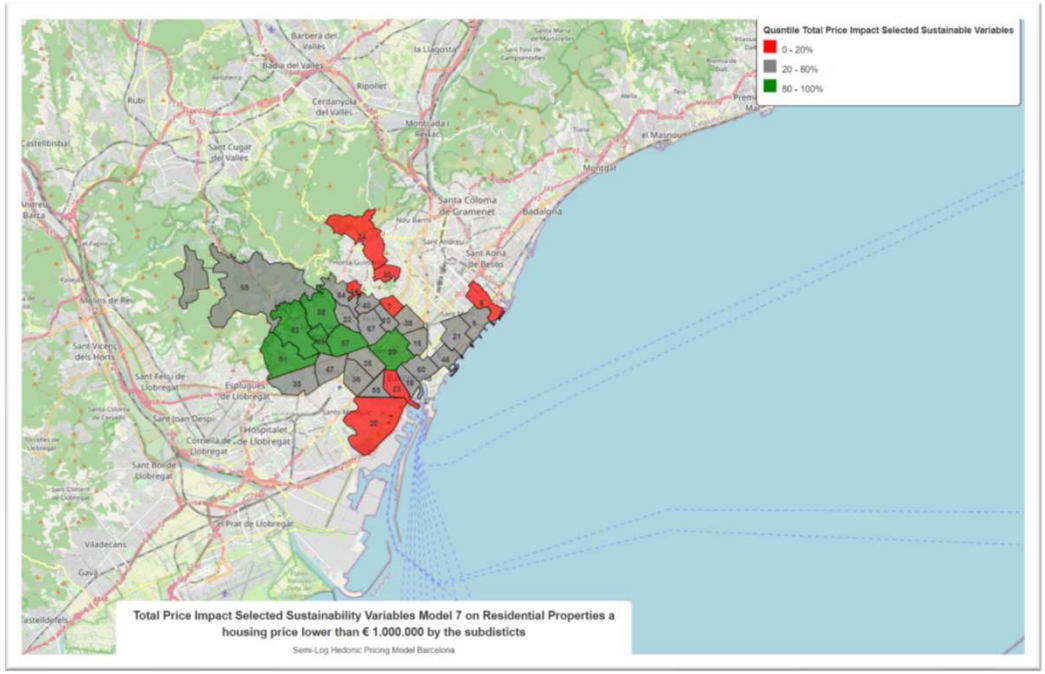



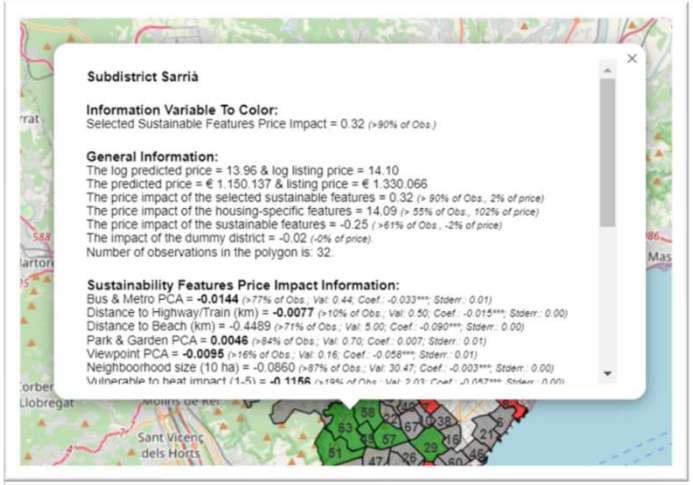
# Example 3: Purpose and parameters

The purpose of example 3 is to display information about the price impact of all sustainable variables in Model 7 on the housing prices lower than € 1.000.000 by the subdistrict.

| Parameters | Example Map 3 |
|---|---|
| Selected Sustainable Features | Sustainable_predictors |
| Map_save_name | 'slideshow_map_3' |
| Title | 'Total Price Impact Selected Sustainability Variables Model 7 on Residential Properties a housing price lower than € 1.000.000 by the subdisticts' |
| Subtitle | "Heckman Selection Model Barcelona" |
| Legend_title | 'Quantile Total Price Impact Sustainable Variables' |
| Circle_Multiplier | 15 |
| DF | df_ols |
| Model_result | SL_ols_model_7_result |
| Color_var | "Sustainable Features Price Impact" |
| N_color_cat | 5 |
| Model_predictors | Model_7_predictors_order |
| Filter_dic | Filter_dic['filter_sign'] = 'lower'<br>Filter_dic['filter variable'] = 'Price'<br>Filter_dic[filter_value'] = 1000 |
| Variable_type_dic | Variable_type_predictors (specified in the notebook) |
| Ref_group_dic | Ref_group_dic (specified in the notebook) |
| N_clusters | 100 |
| Lat_col | 'latitude' |
| Long_col | 'longitude' |
| Show_all (True/False) | True |
| SVM_Cluster (True/False) | True |
| Subdistrict_Cluster (True/False) | False |
| Save (True/False) | True |

# Example 3: Screenshots





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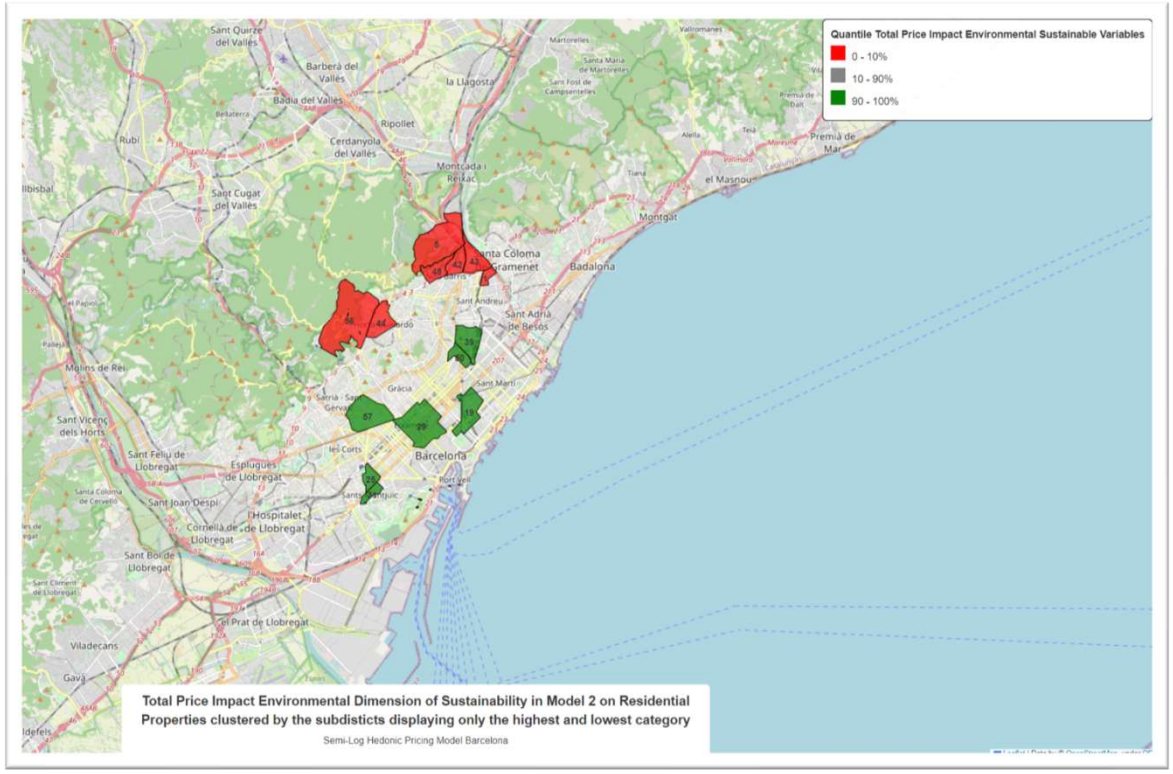
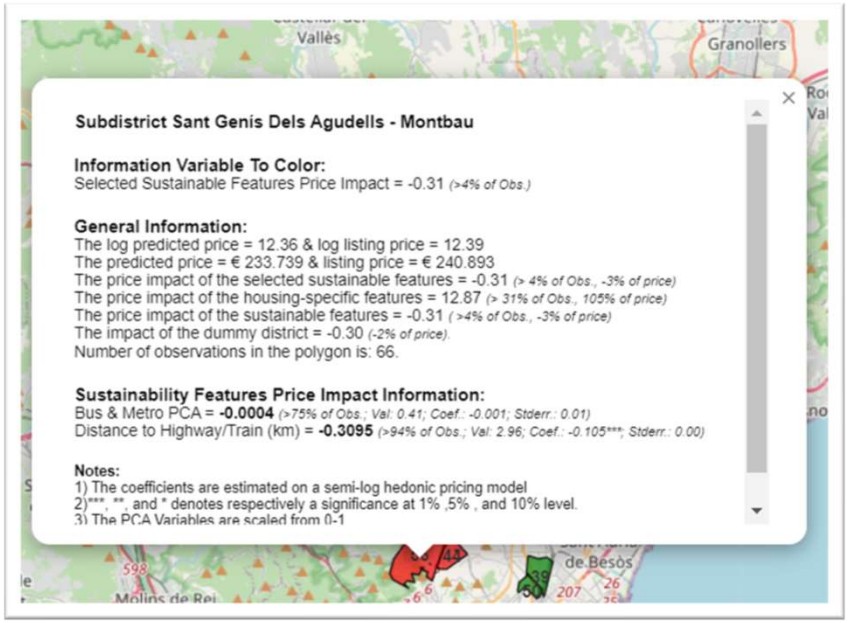
# Example 4: Purpose and parameters

The purpose of example 3 is to display information about the price impact of the environmental variables in Model 2 on the housing prices by the subdistrict showing only the highest and lowest category.

| Parameters | Example Map 4 |
|---|---|
| Selected Sustainable Features | ['Bus & Metro PCA',<br>'Distance to Highway/Train (km)'] |
| Map_save_name | 'slideshow_map_4' |
| Title | Total Price Impact Environmental Dimension of Sustainability in Model 2 on Residential Properties clustered by the subdisticts displaying only the highest and lowest category' |
| Subtitle | "Heckman Selection Model Barcelona" |
| Legend_title | 'Quantile Total Price Impact Sustainable Variables' |
| Circle_Multiplier | 15 |
| DF | df_ols |
| Model_result | SL_ols_model_2_result |
| Color_var | "Sustainable Features Price Impact" |
| N_color_cat | 10 |
| Model_predictors | Model_2_predictors_order |
| Filter_dic | Filter_dic = {} |
| Variable_type_dic | Variable_type_predictors (specified in the notebook) |
| Ref_group_dic | Ref_group_dic (specified in the notebook) |
| N_clusters | 100 |
| Lat_col | 'latitude' |
| Long_col | 'longitude' |
| Show_all (True/False) | True |
| SVM_Cluster (True/False) | True |
| Subdistrict_Cluster (True/False) | False |
| Save (True/False) | True |

# Example 4: Screenshots



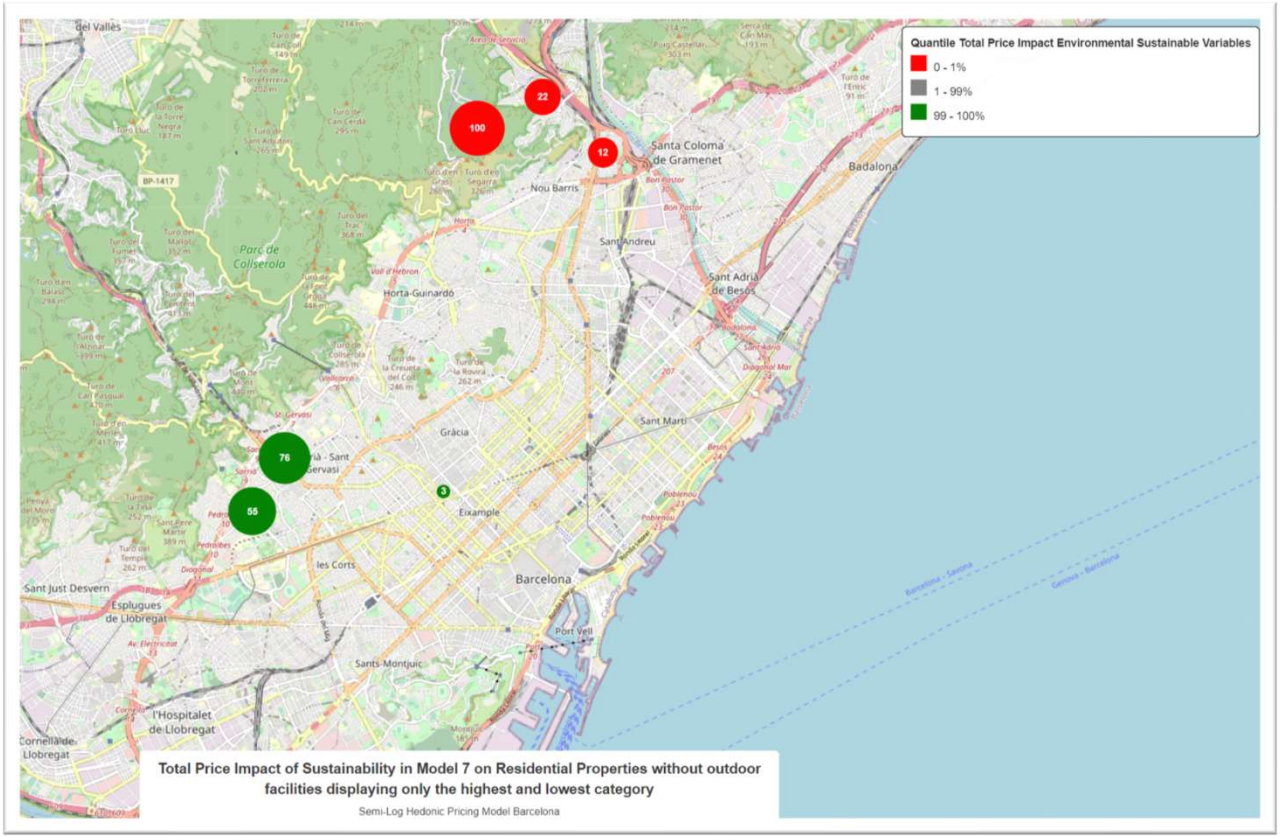



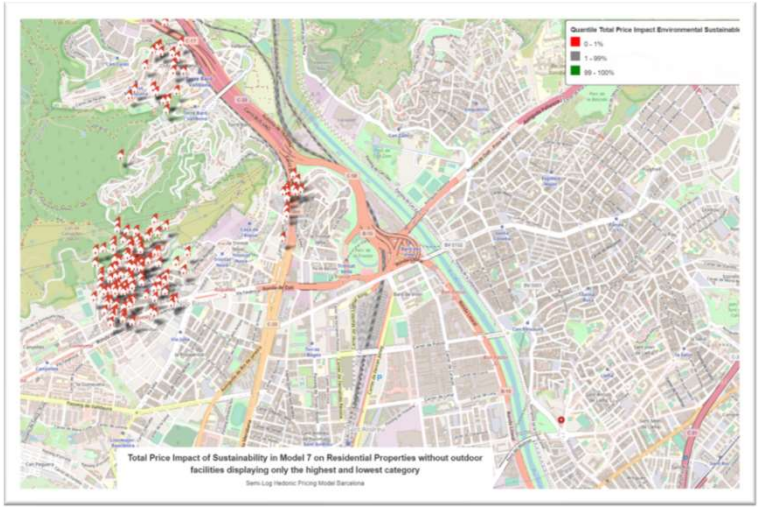
# Example 5: Purpose and parameters

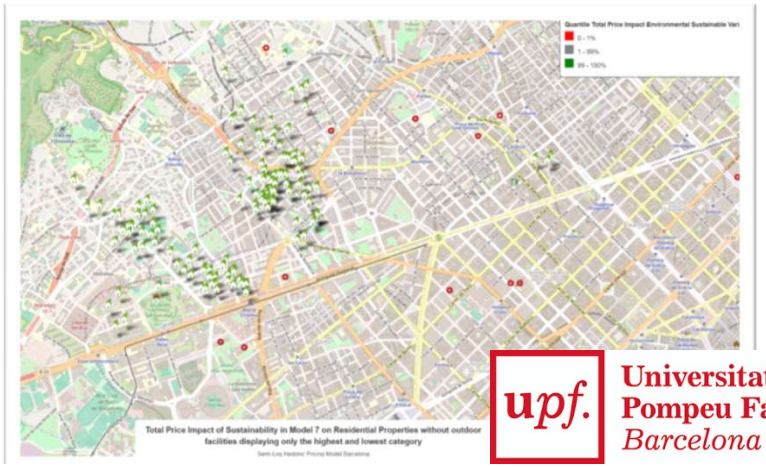
The purpose of example 3 is to display information about the price impact of the environmental variables in Model 2 on the housing prices by the subdistrict showing only the highest and lowest category in 100 categories.

| Parameters | Example Map 5 |
|---|---|
| Selected Sustainable Features | ['Bus & Metro PCA',<br>'Distance to Highway/Train (km)'] |
| Map_save_name | 'slideshow_map_7' |
| Title | 'Total Price Impact Sustainability Variables Model 7 on Residential Properties without outdoor facilities displaying and the highest and lowest category. |
| Subtitle | "Heckman Selection Model Barcelona" |
| Legend_title | 'Quantile Total Price Impact Sustainable Variables' |
| Circle_Multiplier | 15 |
| DF | df_ols |
| Model_result | SL_ols_model_7_result |
| Color_var | "Sustainable Features Price Impact" |
| N_color_cat | 10 |
| Model_predictors | Model_7_predictors_order |
| Filter_dic | Filter_dic['filter sign'] = 'not equal to'<br>Filter_dic['filter variable'] 'Outdoor facilities'<br>Filter_dic['filter value'] = 1 |
| Variable_type_dic | Variable_type_predictors (specified in the notebook) |
| Ref_group_dic | Ref_group_dic (specified in the notebook) |
| N_clusters | N/A |
| Lat_col | 'latitude' |
| Long_col | 'longitude' |
| Show_all (True/False) | True |
| SVM_Cluster (True/False) | False |
| Subdistrict_Cluster (True/False) | False |
| Save (True/False) | True |

# Example 5: Screenshots

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