



A Hedonic Model for Housing Prices in Wilsonville, Oregon

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I. Abstract

We estimate a hedonic model for housing prices in Wilsonville, Oregon. Our data for 197 houses is drawn from Zillow for 2014 to 2017. We find that location variables, including proximity to the Charbonneau Golf Course, as well as the number of bedrooms, the square footage of the house, and whether or not the house is a single level house are statistically significant factors affecting housing prices. Results indicated that the price of a house on the Charbonneau Golf Course is at least 15% higher than a house located elsewhere in Wilsonville, Oregon.

II. Empirical Model and Variables

$$\ln(\text{PRICE}_i) = f(\text{AGE}_i, \text{BATH}_i, \text{BED}_i, \text{SHARED}_i, \text{SINGLE}_i, \text{SQ}_i, \text{NE}_i, \text{NW}_i, \text{OFF}_i)$$

Variable	Expected Effect	Explanation
Dependent Variable		
ln(Price)		Percentage change in price of the house
Qualitative Variables		
AGE	(-)	The age of the house using year built
BATH	(+)	The number of bathrooms in the house
BED	(+)	The number of bedrooms in the house
SHARED	(-)	1 if the house shared a wall with another house, 0 otherwise
SINGLE	(+)	1 if the house is single story, 0 otherwise
SQ	(+)	The square footage of the house
Location Variables		
NE	(-)	1 if a house is north of the Willamette River and east of I-5, 0 otherwise
NW	(-)	1 if a house is north of the Willamette River and west of I-5, 0 otherwise
OFF	(-)	1 if a house is in the Charbonneau District but off the golf course, 0 otherwise

III. Theory and Hypotheses

- AGE is hypothesized to have a negative relationship with ln(PRICE) because the older the house the less desirable it is
- BATH is hypothesized to have a positive relationship with ln(PRICE) because a house is more desirable with more bathrooms
- BED is hypothesized to have a positive relationship with ln(PRICE) because a house is more desirable with more bedrooms
- SHARED is hypothesized to have a negative relationship with ln(PRICE) because people prefer stand alone houses.
- SINGLE is hypothesized to have a positive relationship with ln(PRICE) because many consumers, especially Baby Boomers, prefers single level homes
- SQ is hypothesized to have a positive relationship with ln(PRICE) because a larger home is more valuable than a smaller home, all else held constant.
- NE, NW, and OFF if these dummies have a negative relationship with ln(PRICE), there is a premium to be paid for living on the Charbonneau Golf Course.

IV. Data

• Data Collection and Challenges:

- We collected our data from Zillow, an online home search engine. Initially we collected data from 200 houses, sold from 2014 to 2017. Each region: NE, NW, OFF, and an omitted variable for a house being on the Charbonneau Golf course, contributed 50 houses each. During data collection, each researcher independently selected 25 houses from each region. This decision to separate the data collection was to alleviate the problems of selector's bias. After randomly selecting houses the decision was made to remove 3 houses from the data set because they were extreme outliers in terms of price.

• Data Source:

- <https://www.zillow.com/wilsonville-or/>

V. Empirical Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.264613	6.704668	-0.039467	0.9686
AGE	0.006265	0.003424	1.829858	0.0689
BATH	0.171611	0.040069	4.282885	0.0000
BED	0.137815	0.031942	4.314491	0.0000
NE	-0.274737	0.063325	-4.338538	0.0000
NW	-0.386954	0.082657	-4.681426	0.0000
OFF	-0.152782	0.041169	-3.711079	0.0003
SHARED	-0.054404	0.039723	-1.369559	0.1725
SINGLE	0.101841	0.049643	2.051456	0.0416
SQ	1.05E-05	1.72E-05	0.612531	0.5409
R-squared	0.408121	Mean dependent var		12.89855
Adjusted R-squared	0.379634	S.D. dependent var		0.314416

VI. Conclusion

- Holding the other variables constant, the following percentages represent the mark-up for houses on the Charbonneau Golf Course relative to houses in the other regions.
 - Off: 15.28%
 - NE: 27.47%
 - NW: 38.7%
- We conclude that a golf course is an amenity that creates a housing price premium.