

Residential Real Estate Prices: A Room with a View

Authors Michael T. Bond, Vicky L. Seiler and
Michael J. Seiler

Abstract

This article is the winner of the Real Estate Broker/Agency manuscript prize (sponsored by the Center for the Study of Real Estate Brokerage/Agency at Cleveland State University) presented at the 2001 American Real Estate Society Annual Meeting.

This study examines the effect that a view of Lake Erie has on the value of a home. Unlike previous studies, the current investigation is able to successfully control for view. That is, because of the unique building codes of lakefront homes in this sample, homes analyzed either do or do not have a view. Moreover, transaction-based home prices are used which is an improvement over previous studies that rely on appraisal-based data. The results indicate that square footage and lot size also significantly affect a home's value. More importantly, having this very desirable view adds \$256,544.72 (an 89.9% premium) to the value of the home.

Introduction

One of the most pleasant occurrences in life is the feeling derived from a view of a large body of water. The soothing sensation related to the movement of an ocean rivals any backrub or physical therapy session. The continuous sound of rolling waves has a relaxing impact on most individuals. Alterations in the skies above various bodies of water generate amazingly beautiful color schemes. It should come as no surprise, then, that people seek to be near water and have a view of it. It should also be expected that the view of water from homes has a positive impact on the demand for these properties. Surprisingly, the academic literature studying this relationship is somewhat limited.

The shortage of research on the impact of waterfront views on residential property values is probably related to the subjective nature of what is a water view as well as the need to classify "good" views, "average" views and so-forth. As will be seen, this is not a problem with the data set employed in this study.

The next section reviews the literature concerning the effect of views on property values. The data sources, methodology employed and results are then explained. The final section presents a summary of the findings.

Literature Review

Studies examining the impact of views on property values date back to 1973. Most of the studies find that the variable, view, has a statistically significant effect on the value of homes (Darling, 1973; Morton, 1977; Plattner and Campbell, 1978; Gillard, 1981; Rodriguez and Sirmans, 1994; Benson, Hanson, Schwartz and Smersh, 1996, 1997; and Seiler, Bond and Seiler, 2001). The few studies that show a non-significant relationship for either view or the distance the property is from the water express difficulties with qualitative assessments of views or contagion effects (Davies, 1974; Brown and Pollackowski, 1977; and Correll, Lillydahl and Singell, 1978).

A more recent study by Seiler, Bond and Seiler (2001) examined the impact of a Lake Erie view on 1,172 Cuyahoga lakefront and adjacent properties using tax assessment values for 1999. Property values were statistically related to a view dummy, age of the property, an air conditioning dummy, a roof quality dummy, the square footage of the home, construction quality ranging from 1 to 6 and a basement dummy. The view variable was highly significant and indicated that, after controlling for home characteristics, a Lake Erie view added approximately \$115,000 to a home's assessed value. The sole drawback to this study was the estimation of home values using tax assessment instead of transaction-based data.

The majority of existing studies in this area indicate the positive linkage between good views and higher home values. This study extends the current body of knowledge by using a data set that does not suffer from the contagion effect. Specifically, virtually all of the Lake Erie shoreline is developed with homes either placed closely together or, in the case of large distances between homes, placed far from the adjacent street. Thus, in almost all cases, there either is or is not a clear-cut view of Lake Erie. Moreover, the data used in the current study is all transaction-based.

Data and Methodology

The initial data set used in this study includes sales prices for all properties for the last twenty-five years as well as tax assessment values for 2000. While it would be possible to pool the data and include time as an independent variable, we choose not to do so because most of the homes in the sample have not been sold in decades. The sample is limited to homes that have sold in the last thirty months. This accomplishes two things. First, it eliminates the need for pooling

Exhibit 1 | Descriptive Statistics

	N	Min.	Max.	Mean
AGE	190			59.07
AIRCOND				
Central	69			
Window unit	0			
No A/C	121			
ATTIC				
Fully finished	36			
Unfinished	32			
No attic	122			
BASEMENT				
Basement	173			
No basement	17			
BATHROOMS	190	1	5	1.97
BEDROOMS	190	1	7	3.66
CONSTRQL	190	1	6	3.89
FIREPLACE	190	0	4	1.21
FRONTAGE	190	34	184	2,625.30
HOMESQFT	190	1,134	6,842	19,709.35
LOTSIZE	190	3,440	216,920	
ROOFSTYLE				
Slate and tile	40			
Wood shingle	13			
Asphalt shingle	133			
ROOMS	190	4	16	7.94
VALUE	190	33,750	1,850,000	396,196
VIEW				
Yes	87			
No	103			

and the statistical problems that arise as a result. Second, the home value variables are market-based which eliminates the need for appraisals of properties and the inaccuracies they produce. The model used in this study is as follows:

$$\begin{aligned}
 Y_1 = & \alpha_i + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \dots + \beta_9 X_9 \\
 & + \beta_{10} X_{10} + \beta_{11} X_{11} + \varepsilon,
 \end{aligned}
 \tag{1}$$

Exhibit 2 | Z-Test to Determine if Having a Lake View Affects the Value of the Home

	Lakefront	Adjacent
Mean	527,184	285,518
Standard Error	35,340	18,713
Median	430,000	227,000
Mode	975,000	175,000
Kurtosis	2.69	5.49
Skewness	1.55	2.07
Z-Test: Two Sample Means	527,184	285,518
Z-Score	6.08	6.08

Where:

- Y_1 = Market sales price of the home;
- X_1 = A rating of the home's construction quality;
- X_2 = The age of the house (in years);
- X_3 = Roof style;
- X_4 = Basement;
- X_5 = Air conditioning;
- X_6 = Attic style;
- X_7 = Total number of bedrooms in the home;
- X_8 = Total number of bathrooms in the home;
- X_9 = Total square footage of living space in the home;
- X_{10} = Lot size (in square feet); and
- X_{11} = Length of linear lake frontage (in feet).

It is anticipated that property value is positively related to view, construction quality, slate roofs, having a basement, having central air conditioning, having a finished attic, the number of bedrooms, bathrooms, fireplaces, living space, lot size and lake frontage. The sign on age is ambiguous since a higher demand for newer homes may be offset by perceived superior construction and unique aspects of older homes. Descriptive statistics for the dependent and independent variables are presented in Exhibit 1.

Results

A simple Z-test of two sample means is performed in Exhibit 2. The goal is to get a general feel for the differences in transaction-based home values for homes with and without a view of the lake. Homes with a water view average \$527,184

Exhibit 3 | Correlation Matrix

	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8	Column 9	Column 10	Column 11
Column 1	1										
Column 2	0.4178	1									
Column 3	0.1651	0.0708	1								
Column 4	0.0025	0.0368	0.0546	1							
Column 5	0.1046	0.0340	0.0466	0.1407	1						
Column 6	0.2491	0.1226	0.5003	0.0605	0.0616	1					
Column 7	0.2557	0.0323	0.1782	0.0419	0.0028	0.3101	1				
Column 8	0.0723	0.2205	0.2372	0.0745	0.0256	0.3792	0.2781	1			
Column 9	0.1318	0.0330	0.1464	0.3547	0.0244	0.2748	0.0874	0.1339	1		
Column 10	0.0285	0.1256	0.2313	0.4183	0.1344	0.2041	0.0851	-0.0462	-0.1830	1	
Column 11	-0.0980	0.2088	0.3519	0.1006	0.0922	-0.2363	0.1344	-0.1517	-0.0627	-0.1646	1

Exhibit 4 | Results from Full Regression

Variable	Beta	Std. Error	t-Stat.
Intercept	1,022.36	123,525.08	0.01
View	269,850.39	37,947.85	7.11
Construction quality	5,425.71	15,639.65	0.35
Age	712.46	996.34	0.72
Basement	65,858.44	67,594.87	0.97
Square footage	47.88	19.48	2.46
Lot size	2.02	1.00	2.04
Frontage	327.61	712.06	0.46
Air conditioning	45,260.54	41,451.19	1.09
Attic style	-22,492.67	45,189.08	0.50

in price, while those without a view are valued at \$285,518, on average. This difference is significant well beyond the 99% level. However, even though homes with a view are nearly twice as expensive as those without a view, this simple test does not conclude that the view is the only explanation. That is, while view is controlled for, there are numerous additional home attributes that might be different between the two samples that may be driving the results.

Before all the variables can be entered into the regression analysis, it must first be verified that they are not too highly correlated. A correlation matrix is provided in Exhibit 3 for this purpose. While, somewhat surprisingly, the variables do not exhibit significant levels of correlation, not all variables will be used in the regression analysis. The variables, “number of bedrooms,” “number of bathrooms,” “number of fireplaces” and “square footage,” will be represented solely by the variable, “square footage.”

Exhibit 5 | Results from Full Regression—ANOVA Results

	Degrees of Freedom	SS	MS
Regression	10	49.66	49.66
Residual	179	10.81	60.40
Total	189	15.78	

Note: Sample size = 190. $R^2 = .3147$; Adj. $R^2 = .2764$; Std. Error = 245,776.

Exhibit 6 | Results of Regression with only Statistically Significant Variables Included

Variable	Beta	Standard Error	t-Stat.
Intercept	71,844.95	48,151.58	1.49
View	256,544.72	36,108.57	7.10
Square footage	60.93	15.82	3.85
Lot size	2.38	0.95	2.50

Exhibits 4 and 5 show the results from a regression of the remaining independent variables against the transaction-based dependent variable, home values. The only variables that are significant are view, square footage and lot size. Since the non-significant variables are included with the significant ones, the beta coefficients will be somewhat biased. To get an unbiased estimation of the true beta values, the regression was again estimated, this time, with just the remaining significant independent variables included in the model.

Exhibits 6 and 7 display the final results from the study. That is, only the three significant variables remain in the regression analysis. Now the beta values can be interpreted without bias. The focus of the analysis, view, has an associated *t*-Statistic of 7.10, which is significant well beyond the 99% level. Most importantly, the unstandardized beta value is 256,544.72. This means that after controlling for significant home characteristics, the premium added to homes with a view equals \$256,544.72. This is quite a large premium even given the spectacular view that Lake Erie offers.

To examine for the possibility of significant increases in the market value of lakefront properties over the sample period, sales dates are included as an additional regressor in both the full and truncated regressions. In both cases, the impact of time on property value was positive, but not significant. For this reason, the results are omitted. Thus, the relatively short sample period of 30 months does

Exhibit 7 | Results of Regression with only Statistically Significant Variables Included—ANOVA Results

	Degrees of Freedom	SS	MS
Regression	3	45.72	15.24
Residual	186	11.20	60.23
Total	189	15.78	

Note: Sample size = 190. $R^2 = .2899$; Adj. $R^2 = .2785$; Std. Error = 245,422.

not contain a significant trend in value. It is possible that this is partially related to a significant number of “tear downs” of older lakefront properties in the 1999–2000 period and replacement with much larger new homes. This is just an anecdotal observation, but a potential explanation is that the county has not yet updated the home characteristic data (excepting home price).

Conclusion

The major contribution of this study is that the data set used strictly splits a sample of homes that either do or do not have a clear view of Lake Erie, a desirable home attribute. Moreover, the data used in the current study is transaction-based, which is a much better indicator of true home values than is appraisal-based data.

The results reveal that in addition to square footage and lot size, view is the most significant determinant of home value. Specifically, having a view adds \$256,544.72 to the value of a home. There are several possible future areas of research and improvement in this line of research. Ideas include isolating Lake Erie properties with beach and/or dock access, examining whether or not seasonality changes the view premium (since Lake Erie often freezes in the winter), determining if a property in a different school district has any impact on view value and whether distance from Cleveland’s Central Business District is statistically related to market values.

References

- Benson, E., J. Hanson, A. Schwartz and G. Smersh, The Influence of “World Class Water” Views on Residential Property Values, Presented at the American Real Estate Society Meeting, April, 1996, Lake Tahoe, CA.
- ., The Influence of Canadian Investment on U.S. Residential Property Values, *Journal of Real Estate Research*, 1997, 13:3, 231–49
- Brown, G. and H. Pollakowski, Economic Value of Shoreline, *The Review of Economics and Statistics*, 1977, 59:3, 272–78.
- Correll, M., J. Lillydahl and L. Singell, The Effects of Greenbelts on Residential Property Values: Some Findings on the Political Economy of Open Space, *Land Economics*, 1978, 54:2, 207–17.
- Darling, A., Measuring Benefits Generated by Urban Water Parks, *Land Economics*, 1973, 49:1, 22–34
- Davies, G., An Econometric Analysis of Residential Amenity, *Urban Studies*, 1974, 11, 217–25.
- Gillard, Q., The Effect of Environmental Amenities on House Values: The Example of a View Lot, *Professional Geographer*, 1981, 33:2, 216–20.
- Morton, T., Factor Analysis, Multicollinearity and Regression Appraisal Models, *The Appraisal Journal*, October 1977, 578–88.
- Plattner, R. and T. Campbell, A Study of the Effect of Water View on Site Value, *The Appraisal Journal*, January 1978, 20–25.

Rodriguez, M. and C. F. Sirmans, Quantifying the Value of a View in Single Family Housing Markets, *The Appraisal Journal*, October 1994, 600–03.

Seiler, M., M. Bond and V. Seiler, The Impact of World Class Great Lakes Water Views on Residential Property Values, *The Appraisal Journal*, 2001, 69:3, 287–95.

Michael T. Bond, Cleveland State University, Cleveland, Ohio 44115 or mbond@csuohio.edu.

Vicky L. Seiler, Hawaii Pacific University, Honolulu, HI 96813 or vseiler@hpu.edu.

Michael J. Seiler, Hawaii Pacific University, Honolulu, HI 96813 or mseiler@hpu.edu.

