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July 1989

CONTRIBUTORY VALUE OF RIPARIAN

RIGHTS TO REAL PROPERTY

by

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ABSTRACT

Results indicate that difference in quality of riparian rights are reflected in prices of real estate. Estimated compensation for complete loss of riparian rights, for half acre lots with shallow and deep-water frontage are \$32,000 and \$63,500, respectively. For partial loss, compensation is \$28,500, for deep-water frontage lots.

CONTRIBUTORY VALUE OF RIPARIAN RIGHTS TO REAL PROPERTY

Approaches to the estimation of contributory value of riparian rights to real property have varied (from survey methods sampling residents perceptions on property values, by Day and Gilpin, to multiple regression models by Kentsch; Shutjer and Hallberg; David; and Connor, et al.).¹ Due to differences in methodology, the data sources also varied. Actual sales transactions, assessed valuations, or subjective evaluations have been used, as a measure of value. However, the conclusions in most of the studies were similar: the contributory value of the water frontage was large in relation to total value of the property.²

Most previous efforts sought to examine the impacts of water or recreational projects on property values (Knetsch, Shutjer and Hallberg, Laessing, et al., Day and Gilpin). Other studies focused on differences in values of riparian land due to differing lake characteristics (David), or the effects of water frontage on property values (Connor, et al.). Although literature on contributory value of riparian rights to real property has grown, no effort has been made to evaluate the effects of differences in quality of riparian rights on land values. Quality of riparian rights is determined by the possible uses of the water, including recreation, agriculture, commerce and industrial purposes. If water depth determines possible uses, quality of riparian rights associated with shallow-water frontage are inferior to the quality associated with deep-water frontage. Man-made fluctuations in pool levels, such as interbasin transfers that result in a reduction in water level, also alter the quality of riparian rights.

Interbasin transfers are becoming increasingly important, as areas where population and industrial growth are concentrated is experiencing water deficits, while a surplus may exist in other areas. Water will have to be transferred from surplus to deficit areas in large quantities to ensure economic growth. If the differences in the quality of riparian rights is recognized by the market and reflected in prices of real estate, interbasin transfers have important economic and legal implications. For example, riparian owners may need compensation for any losses in value stemming from interbasin transfers. Just compensation is due by law and is defined in the United States Constitution.

The purpose of this study was twofold: (1) to test the hypothesis that differences in the quality of riparian rights are recognized by the market and reflected in prices of real estate;³ and (2) to determine the damages, for a reduction in the utility associated with riparian rights, due to man-made fluctuations in pool levels. In the following section, data considerations are discussed, followed by empirical models and results. Estimates of just compensation to riparian owners are then presented and discussed.

DATA

The study area selected is Keowee Key Development, a resort-style retirement community located on Lake Keowee in Oconee County, South Carolina. Lake Keowee, built in 1970, is owned by Duke Power Company. Its primary purposes are to provide cooling water for the adjacent Oconee Nuclear Station and to turn the turbines of the Keowee Hydroelectric Station. It is a "working-lake" and as such is subject to weekly man-made fluctuations in pool levels. The maximum drawdown permitted is 28 feet. The water is pumped to a lake at a higher

elevation, Lake Jocassee, and stored for use during peak demand periods for generating electricity. If the utility of a lake frontage lot is not affected by drawdowns the lots are defined as deep-water lots. If the utility of the lot is affected by the drawdowns the lots are defined as shallow-water lots.

There are numerous reasons for selecting Keowee Key Development as the study area for this research. First, the development is a relatively new with a large number of recent bona fide sales of unimproved lakefront and non-lakefront lots. Second, the lake is subject to man-made fluctuations in the water level, which permits the evaluation of the quality of riparian rights. Third, the study area consists of one subdivision, thus, reducing the number of explanatory variables that have to be included in the econometric model.

Sales data for this research were collected from the Oconee County Tax Assessors Office. There were 130 lakefront and 279 non-lakefront transfers between 1984 and 1986. The final number of observations of lakefront property included in the model was 107, as 23 observations were deleted because of incomplete information. Of the 279 non-lakefront lots, 23 golf front lots were also excluded from the final analysis because their sales prices were considered to be inflated relative to other non-lakefront lots.

Sales were not concentrated in any year; 30 percent occurred in 1984, 25 percent in 1985, and 45 percent in 1986. The average size lot for all land transfers was 0.54 acre. Prices for unimproved deep-water lots ranged from \$30,000 to \$195,000 with a mean of \$116,875 per lot. Prices for unimproved shallow-water lots ranged from \$14,000 to \$165,000 with a mean of \$71,335 per lot. The price range for unimproved no-water lots was \$8,800 to \$100,000 with a mean of \$42,626 per lot.

EMPIRICAL MODEL

There are three relevant comparisons, the first being the comparison of prices paid for deep-water lots to shallow-water lots. If the market recognizes differences in the quality of riparian rights shallow-water frontage lots will sell for less than lots with deep-water frontage. This comparison provides an estimate of the compensation due to owners of deep-water lots when the utility of deep-water lots is reduced to that of shallow-water lots. Second, the comparison of shallow-water lots to lots with no-water frontage. This comparison provides an estimate of compensation due the owners of shallow-water lots as a result of permanent drawdown or drainage, which reduces the utility of the shallow-water lots to that of non-lakefront lots, i.e., a complete loss in riparian rights. Third, the comparison of deep-water lots to no-water frontage lots, which provides an estimate of the loss to these riparian owners of draining the lake. These comparisons require the estimation of a model for each situation. Technically, the analysis is possible using one model if the same information is available on all lots, which is not the case. Each model is discussed in turn.

Model I

A single-equation, multivariable regression model is utilized to test if the difference in mean prices paid for deep-water lots and shallow-water lots is equal to zero. Explanatory variables included in the model are consistent with those used in previous studies. Model I is defined as:

$$\text{PSF} = \text{DATE} + \text{LSIZE} + \text{SLOPE} + \text{COVN} + \text{WATDEP} + e$$

where

PSF = price per square foot of the lot;

- DATE - a continuous variable representing the date the property was transferred;
- LSIZE - natural log of the square footage in the lot;
- SLOPE - a discrete variable equal to 1 if the slope of the lot is classified as steep and is equal to zero if the slope of the lot is classified as gentle;
- COVN - discrete variable representing minimum square footage requirements for houses with the following classes: 1080, 1200, 1400, 1800, 2200, 2400;
- WATDEP - a discrete variable equal to 1 if the lot has shallow-water frontage and zero if the lot has deep-water frontage;
- e - error term.

Reasons for inclusion of each variable and hypothesized effects are discussed in turn. Since data covers a three year period, January 1984 through December 1986, the continuous variable DATE is included to account for temporal effects, e.g., inflation, on sales prices. The variable DATE is hypothesized to have a positive influence on price.

The relationship between price per square foot and size of lot is hypothesized to be nonlinear; therefore, LSIZE variable (natural log of size) is included to aid in the expression of nonlinear price-quantity characteristics. The lot size should have a negative effect on land price.

SLOPE is a discrete variable equal to one if the slope of the lot is classified as steep and is equal to zero if the lot is classified as gentle. Lots are classified as steep if the slope of the lot is severe enough to influence any or all of the following: ingress or egress, construction costs, or lake access. Lots not falling under this classification are defined as gentle. Since a steep slope may limit the type of house that can be built and accessibility to water, lots classified as having a steep slope are hypothesized to sell for a lower price than lots with gentle slopes.

Keowee Key development consists of numerous subdivisions. Restrictions on minimum square footage for houses vary by subdivision within the development. In addition, these subdivisions were placed on the market at different points in time. Lots that have a higher house-square-footage requirement are expected to sell for a higher price than lots of similar utility with lower square footage requirements. Therefore, it is hypothesized that the class variable COVN will have a positive impact on price.

The discrete variable WATDEP represents lots with shallow-water frontage and lots with deep-water frontage. It is hypothesized that lots with shallow-water frontage will sell for less than those lots with deep-water frontage.

Model II

Model II is used to test the hypothesis that lots without lake frontage sell for less than lots with shallow-water frontage. Therefore, variable WATDEP is redefined to represent lots with no-water frontage and lots with shallow-water frontage. Variables COVN, DATE, and LSIZE are the same variables as for Model I with similar reasoning for their inclusion. The variable SLOPE is deleted from Model II because the classification of slope for non-lakefront lots is not available. There are 185 lots with no-water frontage and 60 with shallow-water frontage.

Model III

Model III is similar to Model II with similar independent variables. The hypothesis for Model III is that price of deep-water lots is expected to be greater than the price of non-lakefront lots. Therefore, WATDEP is redefined to represent lots with no-water frontage and lots

with deep-water frontage. Data consists of 241 observations, 193 with no-water and 48 with deep-water frontage.

RESULTS

Ordinary least squares estimation procedure is used to estimate the coefficients, Table 1. A two tail t-test is used to test the hypotheses: difference between prices paid for deep-water and shallow-water lots, shallow-water and no water lots, and deep-water and no water lots, are significant.

Model I

The explanatory power of Model I is reasonably good, with 60 percent of the variation in the dependent variable explained by the independent variables. Class variables COVN and SLOPE are significant at the 95 percent confidence level, while WATDEP and LSIZE are significant at the 99 percent confidence levels.

The hypothesis: there is a difference in prices paid for deep water and shallow water is not rejected. Shallow-water frontage lots sold for \$1.31 less per square foot than deep-water frontage lots, holding slope, size of lots, and restrictive covenants constant.

Model II

Model II has lower explanatory power relative to Model I. However, all independent variables are significant at 99 percent confidence level and their signs conform to expectations. Examination of the coefficient for the variable representing no-water-lots reveals these lots sell for \$1.47 less per square foot than lot with shallow-water, holding other explanatory variables constant. Thus the hypothesis that lots without lake frontage sell for less than shallow-water lots is not rejected.

Model III

Explanatory power is reasonably good with an R^2 of 0.57. The F value of 42.69 indicates the independent variable is related to the dependent variables. Both COVN, and WATDEP are significant at the 95 percent confidence level. Deep-water lots sell for \$2.92 more than lots with no lake frontage.

IMPLICATIONS AND SUMMARY

Results from the three price predicting models show that riparian rights have value and that differences in the quality of riparian rights are recognized by the market and reflected in the prices of riparian real estate. The South Carolina Constitution requires just compensation be paid to riparian owners for any loss in value stemming from interbasin transfers.⁴ Since the three hypotheses are not rejected, this implies riparian owners should not only be compensated for a complete loss of rights, i.e., draining the lake, but also should be compensated for any partial loss, i.e., reduction in pool levels.

Suppose a permanent drawdown in the lake is of a sufficient magnitude to result in a loss of lakefront amenities for shallow-water lots and a reduce the utility of deep-water lots to a level similar to shallow-water lots. If shallow-water lots lose all of their amenities due to the drawdown, the utility of the lot becomes similar to those lots in the development that do not have lake frontage. Thus, owners of shallow-water lots should receive \$1.47 per square foot in compensation as provided for under state laws. Assuming a one-half acre lot, the compensation due is \$32,016. This estimate is the minimum dollar amount due, since the taking of riparian rights may also result in damage to the remaining real estate. Under state rule, just compensation requires

the property owner be paid the value of the real property taken plus the amount of the damages to the remaining property that results from the taking.

Owners of deep-water lots are also due compensation if a permanent drawdown in the lake causes a loss in the utility of their riparian rights. Assuming that the utility of the deep-water lots is reduced to that of shallow-water lots, the compensation due to the owners of deep-water lots is \$1.31 per square foot. Assuming a one-half acre lot, the compensation totals \$28,531 per lot.

If the drawdown is of a magnitude that the deep-water lots lose all of their riparian amenities, the compensation due to owners is \$2.92 per square foot, or \$63,598 per lot, assuming a one-half acre lot.

It is assumed that non-riparian owners in the development are not affected by a reduction in the level of the lake. This may not be the case. Many developments, like Keowee Key, have a marina, boat ramps, or community boat docks, that owners of non-riparian lots use. The question then becomes whether or not non-riparian lot owners have riparian rights through a home owners association. If they do, owners of these lots may have a claim for both direct and indirect damages due to the taking of the water.

Table 1. Estimated Coefficients for the Three Price Predicting Models, Keowee Key Development, South Carolina - 1984-86.

Variable	Estimated Coefficients for the Three Models[a]		
	Model I	Model II	Model III
Intercept	31.87* (5.60)	15.85 * (2.18)	23.40 * (2.92)
LSIZE	-2.63* (0.55)	1.28 * (0.21)	-1.84 (0.29)
SLOPE			
steep	-0.60* (0.28)	-	-
gentle	0.00[b] (0.0)	-	-
COVN			
1080	-2.40* (0.90)	-1.86* (0.38)	-0.57* (0.37)
1200	-2.19* (0.90)	-0.75 (0.19)	-
1400	-0.83 (0.80)	-0.31 (0.19)	0.13 (0.27)
1800	0.02 (0.80)	0.00[a] (0.00)	0.10 (0.25)
2200	2.01* (0.89)	-	0.62* (0.31)
2400	0.00[b] (0.00)	-	0.00[b] (0.00)
WATDEP			
shallow-water	-1.31* (0.28)	0.00[a] (0.00)	n.a
deep-water	0.00[b] (0.00)	n.a	0.00[b] (0.00)
no-water	n.a	-1.47* (0.17)	-2.92* (0.20)
OTHER STATISTICS			
R ²	0.61	0.36	0.57
F Statistic	16.77*	19.25*	42.69*
PSF Mean	3.85	2.27	2.84

Dependent Variable: Real Estate Price (\$/square foot)

a. standard errors shown in parentheses

b. The computerized statistical package (Statistical Analysis System - SAS) assigned these variables a coefficient of 0.0 in order to make the comparison among the different classes for the discrete variables.

* - Significantly different from zero at the 5 percent level.

FOOTNOTES

- 1 According to the riparian doctrine, the owners of land adjacent to a watercourse possess correlative rights to use that water (Hite).
- 2 Shutjer and Hallberg found that property values, in a state park in Pennsylvania, were not affected by construction of lakes. This conclusion appears to be the result of a large study area, and real property with diverse value influencing characteristics.
- 3 Since riparian rights are limited to riparian land, the value of the rights, if any, should be reflected in the value of the land.
- 4 In South Carolina "the measure of just compensation is the value of the land required plus any special damage". The state "provides for payment to the land owner of fair market price of property taken, plus payment for diminution in value caused to the remainder of the land owner's property" (Code of Laws of S.C.).

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