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## **Does Proximity to a Golf Course Matter?**

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# Does Proximity to a Golf Course Matter?

## Abstract

In this study, we augment an earlier study<sup>a</sup> by estimating the effect of golf course on housing values using a data set of single-family homes sold between 1994 and 2000. We find that there is generally a positive impact on houses proximate to open space (golf course and neighborhood parks). The value of proximity to golf course is found to be greater than figures reported in previous studies. Proximity impacts extend beyond abutting properties and go as far as to those within almost quarter of a mile. The value of properties proximate to parks is found to be significant and varies with park size and type. Parks classified as small and medium had positive impacts extending over quarter of a mile with the small parks having the greatest impact on the value of properties.

Key words: Hedonic pricing, open space, proximity, value of parks, value of golf course.

## Introduction

According to a recent Sierra Club report (1999), South Carolina lags behind the rest of the nation in terms of open space protection, ranking third to last among the fifty states. In funding for parks and recreation, Greenville County spends at least thirty percent less per household than the state's other metropolitan areas, Spartanburg, Richland, and Charleston counties (Romain 2000). City planners, however, have displayed increased focus on protection of the Reedy River, downtown revitalization, and improving the quality of life for Greenville residents. If the acquisition and protection of open space increases residential property values, property tax revenues would also increase, providing a possible funding mechanism for purchase, development, or maintenance of open space. Quantification of the impact of open space protection on residential property values could guide local and state land use decision-makers in preservation efforts and planning for future growth.

In South Carolina, golfing is a major recreational activity that attracts visitors from other states. Beside the recreational benefits, research has shown that golf creates demand for goods and services of businesses. On the residential front, golf courses are environmentally friendly, offering a direct encounter with nature. People pay a premium to enjoy this utility. About 80 percent of new golf course developments are tied to residential development (Burgess, 1991). Besides the recreational benefits, research has shown that golf creates demand for goods and services of businesses. This economic impact comes in the form of increase in jobs and income for the city's residents. Greenville city, South Carolina, is the site of the very first Carolinas Amateur establishment, which later became the driving force in the creation of the Carolinas Golf Association. Verdae Greens Golf Club is a public golf course within the city limits of Greenville, with an exceptionally convenient layout tucked close to Interstate 85. It used to be

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<sup>a</sup> M. Espey and K. Owusu-Edusei (2001). "Neighborhood Parks and Residential Property Values in Greenville, South Carolina", *Journal of Agricultural and Applied Economics*, 33(3): 487-492.

the site of the Buy.com Tour's Upstate Classic. Verdae Greens is one of the area's best and busiest layouts.

## **Previous Literature**

Asabre and Huffman (1996) studied negative and positive impacts of golf courses to homes and found a negative impact on houses proximate to the gate, but positive for houses having frontage on golf courses in Burlington county, New Jersey. Do and Grudnitski (1995) focused on proximity to golf courses and found that the impact on property values did not extend beyond 100 feet. They concluded that houses abutting golf course were 7.6 percent more in value. Hirsh (1994) confirms that, "significant value can be derived from golf course frontage." Firth (1990) found that golf course frontage may increase residential land value by over \$10 per square foot. Other studies have used hedonic pricing models to estimate the effect of different open space types on a house's sales value or assessed value. Weicher and Zerbst (1973) studied parks in Columbus, Ohio. Correl, Lillydahl, and Singell (1978) studied greenbelts in Boulder, Colorado. Frech and Lafferty (1984) estimated that actions by California Coastal Commission to preserve open space increased home prices by between \$990 and \$5,000. Lupi et al (1991); Doss and Taff (1993); and Mahan, Polasky, and Adams (2000) all estimated a positive value of proximity to different types of wetlands. More recent studies include an analysis of trees, water, and open space in the Netherlands (Luttik 2000) and an analysis of open space and land-use patterns in urban watersheds (Acharya and Bennette 2001). The only recent research focusing on urban parks is Bolitzer and Netusil (2001), and Lutzenheiser and Netusil (2001). Both examined the impact of proximity to various types of open space (parks included) on property values.

Greenville is one of the largest and fastest growing metropolitan areas of South Carolina. City and county planners are beginning to recognize the value of golf courses and neighborhood parks. They need to plan for future park space as the population grows (Perry 2000), yet lack quantification of this value. This study focuses on golf course and neighborhood parks and their impact on single-family homes within Greenville city, South Carolina.

## **Data**

Sales data for single-family homes between 1994 and 2000 is obtained from the county property office. The data contains price as well as housing characteristics such as location (address), number of bedrooms, number of bathrooms house square footage, lot size for lots over one acre, whether or not the house has air conditioning and whether or not the house has a garage. The database also includes a depreciation factor used to assess effective house age, taking into account both actual age and the condition of the house. This variable has a maximum value of 100 for a new house. Parks are categorized into four groups based on size and the amenities available on them. There are twelve small parks, ranging in size from 15,620 to 87,687 square feet, which are grouped together as Small Basic Parks. Four other small parks, ranging in size from 17,541 to 69,921 square feet, are grouped together as Small Aesthetic Parks. Six medium size parks, ranging in size from 210, 635 to 1,101,310 square feet, are grouped under Medium Aesthetic Parks. Finally, two others were grouped under Medium Basic with sizes ranging between 95,425 and 169,751 square feet.

Houses are mapped out on the Greenville city map using GIS software package. Buffers are created at 100 feet intervals around parks and a golf course. Houses are assigned ranges

based on the buffer they fall in. Map of Houses is also overlaid on the Census block map, enabling assignment of neighborhood characteristics contained in the census block data. The census block data includes number of housing units, median household income, average household size and median household value. The number of housing units is divided by the total area to obtain a measure of housing unit density within a block.

## Model

A hedonic housing price technique is used to model the price of a house as a function of the characteristics of a house as follows:

$$P_i = f(S_i, N_i, E_i, G_i)$$

where  $P_i$  is the log of price of a given house,  $S_i$  includes condition (DEPR) with a higher value indicating better condition, the number of baths (BATH), square footage of the house (SQFT), air conditioning (AC), lot size, and whether or not the house has a garage (GARAGE). AC, GARAGE, and two lot size variables are 0-1 dummy variables while the others are continuous variables.  $N_i$  is a vector of census block characteristics and  $E_i$  is park proximity.  $G_i$  is a vector of measures of proximity to golf course. This study uses ordinary least squares estimation of a semi-log model, the structural form found to produce the best results in previous hedonic studies.

## Estimation Results

Definitions and descriptive statistics of variables in the regression models are reported in table 1. Definitions and number of observations within all categories of open space proximities are also reported in table 2. Table 3 shows regression results for three models using Ordinary Least Square. Two ranges are delineated for golf course, three for part type 1 and two for types 2, 3 and 4 each. All housing and demographic characteristics had the expected signs. Annual dummies were included to control for any year-specific differences in prices after deflating all into 1990 dollars using monthly consumer price index. Prices are 3 percent higher between the months of April and September. Note that the distance categories are not mutually exclusive as some houses were, for example, within 1500 feet of one park and within 500 feet of another. In addition, some ranges weren't statistically significant but were included for comparability to other park types.

Results also show that houses abutting golf course generally sell for 27 percent more than those beyond 1100 feet. Houses between 300 and 1100 are 15 percent more in value than those beyond 1100 feet. Note that some houses in these categories also fell within range of some parks.

Houses within 300 feet of the small basic neighborhood parks reduce property values by about 17 percent. On the other hand, there is a significant positive impact on housing prices for homes between 300 and 500 feet. Houses in this range are 8 percent more in value.

There is also a significant positive impact of proximity to Small Aesthetic parks for homes within 600 feet. Houses in this range are 12 percent higher in value than houses beyond 1500 feet range of any park. There is also a positive and significant impact for homes between 600 and 1500 feet. Houses in this range are 7 percent higher in value than those beyond 1500 of parks.

For the attractive medium size parks, there was a positive impact on houses within 200 feet but no significant impact between 200 and 1500 feet. Houses within 200 feet are 23 percent more in value.

Finally, Medium Basic parks were estimated to have a significant negative impact on home values for homes within 600 feet, reducing housing sales values by just over 50 percent and over 34 percent between 600 and 1200 feet.

## **Conclusions**

In general, golf course and parks have positive impact on property values in Greenville, South Carolina. It is possible that acquisition of land for new public golf courses and neighborhood parks, particular in the growing suburbs surrounding Greenville, could be partially financed by higher property tax revenues that would result from increased home sales prices. Better estimates of the impact of parks on home sales values could be valuable information to local parks and recreation departments attempting to justify current expenditures on land acquisition in rapidly growing areas. Such information could also be useful by developers deciding whether or not to include parks or golf courses in new subdivisions, or to land use planners attempting to implement open space requirements for newly developed areas. Demographic information obtained from census tract data could help determine the relationship between demographic characteristics and the purchase of housing near golf courses and neighborhood parks.

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Table 1.summary statistics for housing characteristics (n = 3731)

| Variable                | Mean    | Std. Dev. | Minimum | Maximum | # of observations=1<br>for dummy variables |
|-------------------------|---------|-----------|---------|---------|--|
| Quality                 | 80      | 13.6      | 5       | 100     |  |
| # of Bathrooms          | 1.68    | 0.74      | 0.2     | 7       |  |
| Square footage          | 1459.25 | 612.26    | 240     | 6276    |  |
| Air conditioning        | 0.44    | 0.50      | 0       | 1       | 2349                                       |
| Garage                  | 0.13    | 0.34      | 0       | 1       | 710  |
| 1 to 4 acres            | 0.03    | 0.19      | 0       | 1       | 192  |
| Over 4 acres            | 0.02    | 0.14      | 0       | 1       | 107  |
| April – September sales | 0.56    | 0.5       | 0       | 1       | 2986                                       |
| # Sold in 1994          | 0.14    | 0.35      | 0       | 1       | 522  |
| 1995                    | 0.14    | 0.35      | 0       | 1       | 522  |
| 1996                    | 0.16    | 0.37      | 0       | 1       | 597  |
| 1997                    | 0.16    | 0.37      | 0       | 1       | 597  |
| 1998                    | 0.17    | 0.37      | 0       | 1       | 634  |
| 1999                    | 0.16    | 0.37      | 0       | 1       | 597  |
| 2000                    | 0.07    | 0.25      | 0       | 1       | 261  |

Table 2. Proximity measures by type of open space

| Open space type                | Proximity       | Number of houses in range |
|--------------------------------|-----------------|---------------------------|
| Golf course 1                  | Abutting        | 16                        |
|                                | 300 – 1100 feet | 78                        |
| Park Type 1: Small basic       | Within 300 feet | 31                        |
|                                | 300 – 500 feet  | 100                       |
|                                | 500 – 1500 feet | 481                       |
| Park Type 2: Small attractive  | Within 600 feet | 132                       |
|                                | 600 – 1500 feet | 287                       |
| Park Type 3: Medium attractive | Within 200 feet | 5                         |
|                                | 200 – 1500 feet | 13                        |
| Park Type 4: Medium basic      | Within 600 feet | 81                        |
|                                | 600 – 1200 feet | 441                       |

Table 3. Estimation results: dependent variable log of Price (n = 3731)

| Variables                      | Model 1   |            | Model 2   |            | Model 3   |            |
|--------------------------------|-----------|------------|-----------|------------|-----------|------------|
| Intercept                      | 2.36*     | (0.13)     | 2.4*      | (0.13)     | 2.36*     | (0.13)     |
| Quality                        | 0.063*    | (0.0029)   | 0.061*    | (0.0029)   | 0.061*    | (0.0029)   |
| Quality squared                | -0.00037* | (0.000019) | -0.00036* | (0.00002)  | -0.00036* | (0.00002)  |
| # of Bathrooms                 | 0.22*     | (0.013)    | 0.22*     | (0.013)    | 0.22*     | (0.013)    |
| Square footage                 | 0.0009*   | (0.00004)  | 0.0009*   | (0.00004)  | 0.0009*   | (0.00004)  |
| Square footage squared         | -1.15E-7* | (8.97E-9)  | -1.16E-7* | (8.95E-9)  | -1.14E-7* | (8.95E-9)  |
| Air conditioning               | 0.032*    | (0.015)    | 0.032**   | (0.015)    | 0.033**   | (0.015)    |
| Garage                         | 0.057*    | (0.022)    | 0.056*    | (0.022)    | 0.057*    | (0.022)    |
| 1 to 4 acres                   | 0.086*    | (0.034)    | 0.092*    | (0.034)    | 0.089*    | (0.034)    |
| Over 4 acres                   | 0.13*     | (0.047)    | 0.15*     | (0.047)    | 0.12*     | (0.047)    |
| April – September sales        | 0.03*     | (0.01)     | 0.03**    | (0.013)    | 0.03**    | (0.013)    |
| Annual dummies                 |           |            |           |            |           |            |
| 1995                           | 0.013     | (0.024)    | 0.01      | (0.024)    | 0.01      | (0.024)    |
| 1996                           | 0.068*    | (0.023)    | 0.062*    | (0.023)    | 0.061*    | (0.023)    |
| 1997                           | 0.1*      | (0.023)    | 0.1*      | (0.023)    | 0.1*      | (0.023)    |
| 1998                           | 0.16*     | (0.023)    | 0.15*     | (0.023)    | 0.15*     | (0.023)    |
| 1999                           | 0.23*     | (0.023)    | 0.22*     | (0.023)    | 0.22*     | (0.023)    |
| 2000                           | 0.22*     | (0.03)     | 0.21*     | (0.03)     | 0.21*     | (0.03)     |
| Abutting golf course           | 0.27*     | (0.1)      |           |            | 0.27*     | (0.1)      |
| 300 – 1100 feet of golf course | 0.17*     | (0.05)     |           |            | 0.15*     | (0.06)     |
| Within 300 feet of type 1      |           |            | -0.17**   | (0.08)     | -0.17**   | (0.08)     |
| 300 – 500 feet from type 1     |           |            | 0.08***   | (0.04)     | 0.06      | (0.04)     |
| 500 – 1500 feet from type 1    |           |            | 0.0004    | (0.02)     | 0.009     | (0.02)     |
| Within 600 feet from type 2    |           |            | 0.12*     | (0.05)     | 0.12*     | (0.05)     |
| 600 – 1500 feet from type 2    |           |            | 0.08*     | (0.03)     | 0.07*     | (0.03)     |
| Within 200 feet from type 3    |           |            | 0.23*     | (0.06)     | 0.23*     | (0.05)     |
| 200 – 1500 feet from type 3    |           |            | 0.01      | (0.02)     | 0.01      | (0.02)     |
| Within 600 feet from type 4    |           |            | -0.57*    | (0.18)     | -0.57*    | (0.18)     |
| 600 – 1200 feet from type 4    |           |            | -0.35*    | (0.12)     | -0.35*    | (0.12)     |
| Housing unit density           | -0.0002*  | (0.000012) | -0.0002*  | (0.000012) | -0.0002*  | (0.000012) |
| Median household income        | 3.09E-6*  | (8.13E-7)  | 2.69E-6*  | (8.3E-7)   | 2.69E-6*  | (8.3E-7)   |
| Average household size         | -0.16*    | (0.023)    | -0.16*    | (0.023)    | -0.16*    | (0.023)    |
| Median value                   | 2.33E-6*  | (2.53E-7)  | 2.3E-6*   | (2.53E-7)  | 2.3E-6*   | (2.53E-7)  |
| Adjusted R-square              | 0.69      |            | 0.69      |            | 0.70      |            |

Standard errors are in parentheses. Significance levels \*\*\* = .1, \*\* = .05, \* = .01.

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