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The Impact of Manufactured Housing on Adjacent Site-Built Residential Properties in Two Alabama Counties

Charles E. Hegji and Linda G. Mitchell

For the past two decades, manufactured housing has grown in popularity as an affordable alternative to conventional site-built housing. Wallis (1991) reports that approximately one-fourth of the new housing produced each year is manufactured housing, with approximately 12.5 million manufactured homes being occupied as of 1990. Despite its increased popularity, debate continues as to the appropriateness of manufactured housing. An issue central to this debate is whether the existence of manufactured housing has a negative impact on the property value of adjacent site-built housing.

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Popular belief is that such a negative impact exists.

Several studies have concluded that no negative impact of manufactured housing on the appreciation rate of adjacent site-built homes exists (Hicks, 1982; Gruber et al., 1988; Nutt-Powell et al., 1986; Warner et al., 1993; Shen & Stephenson, 1997). However, many consider the conclusions of these studies unreliable, due to sampling techniques used and geographic areas covered. Because of the inconclusive nature of these studies, further research on the impact of location of manufactured housing on the value of adjacent site-built housing is warranted.

The purpose of the present study is to investigate the impact of manufactured housing on the value of adjacent site-built housing in two Alabama counties, Montgomery County and Lee County. The data used for this study are from the 1997 and 1999 property valuations for each county.

In Lee County, Alabama, no discernable difference between the appreciation rates of site-built homes in close proximity to manufactured homes and site-built properties located at further distances from manufactured housing could be found. However, the results from Montgomery County, Alabama, differ. For Montgomery County, site-built properties located fewer than 250 feet from manufactured housing on average appreciate at lower rates than site-built properties at further distances. This difference in appreciation rates is shown to be statistically significant at all distances studied. These results, and managerial implications, are summarized in this paper.

Literature Review

In spite of the belief that manufactured housing has a negative impact on the value of adjacent site-built housing, only a few studies have been conducted to address this issue. All of these studies conclude that manufactured housing has no negative impact and does not

depress the value of adjacent site-built properties.

Hicks (1982) examined the impact of nearby manufactured housing communities on the values of site-built, single-family housing in San Jose, California, over the period 1973-1981. He compared the appreciation in sales prices of ten, single-family houses sold both before and after an adjacent manufactured housing community was developed to the average rate of appreciation of all single-family houses in San Jose. Hicks found that the average rate of appreciation of the dwellings adjacent to the manufactured housing communities was greater than the average rate of appreciation (18.1% compared to 14.5%). Although interesting, the findings of this study are suspect due to the sample size, only ten observations.

Gruber, Shelton, and Hiatt (1988) studied the impact of scattered manufactured housing on adjacent site-built housing in Guilford, North Carolina. Selling prices for site-built homes in close proximity to manufactured houses were compared to selling prices of comparable site-built houses on road segments not in close proximity to a manufactured house. The data set covered the period January 1980 to June 1986. Because of the variation in property values at different locations, the study measured the impact of manufactured housing on site-built price using three ratios of sales price to appraised tax value: 1) the selling price of a building relative to the tax value of the building; 2) the selling price of the property relative to the tax

value of the property; and, 3) the selling price of the building relative to the estimated replacement value of the building. The study showed that those site-built properties adjacent to manufactured housing sold at comparable and, in some cases, higher prices than site-built properties not in proximity to manufactured housing.

Nutt-Powell, Hoaglin, and Layzer (1986) constructed a linear regression model to predict the sales value of property adjacent to manufactured housing compared to non-abutting properties. The study was conducted using data based on real estate transactions in the Town of Belmont, New Hampshire, for the period 1981-1983. Using the model to compare actual to predicted sales values over this period, the authors found that, although the ratio of actual to predicted sales price of site-built housing not adjacent to manufactured housing was on average 2.5% higher, the difference was not statistically significant. Nutt-Powell, et al. (1986) concluded that manufactured housing does not adversely impact the property value of abutting, site-built, single-family dwellings.

Warner and Johnson (1993) investigated the impact of the location of four mobile home communities on adjacent site-built communities in Michigan over the 1985-1990 period. Appreciation rates per square foot for these site-built communities were compared to similar site-built communities not adjacent to mobile housing communities. In conducting their study, Warner and Johnson

used both market sales prices and interviews with public tax assessment officials to determine the impact of manufactured housing on the value of the site-built homes. The authors found that in all four cases, residential property values adjacent to mobile home communities showed rates of appreciation similar to the appreciation rates of comparable non-adjacent properties.

Shen and Stephenson (1997) used a Geographic Information System (GIS) to study the impact of manufactured housing on the value of site-built housing in four North Carolina counties—Carter County, Henderson County, Wake County, and Pitt County. Using 1988 and 1996 assessed tax values, the study compared average appreciation rates for site-built property at varying distances from both scattered manufactured homes and manufactured housing communities. The study found no discernable pattern between the appreciation rate of a site-built property and its distance from either a scattered manufactured house or a manufactured housing community.

Research Methodology

Early studies of the impact of manufactured housing on site-built property values can be criticized on the grounds that attempts to make the notion of proximity to manufactured housing operational have been somewhat arbitrary. Some studies, for instance, consider a manufactured house to be close to a site-built house if it can be seen from the site-built house. Other studies consider the

properties close if the manufactured and site-built houses are located on the same block. Shen and Stephenson's (1997) use of a Geographic Information System developed a more precise measure of proximity. The procedure for the present study is a modification of theirs.

The technique used in this study sampled appraised property values of owner-occupied manufactured homes and site-built housing in Montgomery County and Lee County, Alabama. The counties studied were chosen partially on the availability of data. However, demographic differences also played a part in this choice. Montgomery County, with a year 2000 projected population of 219,233, contains the state capital and is a semi-urban county. Lee County is more rural, with a year 2000 projected population of 103,962. Moreover, Lee County is the home of Auburn University, which had a 1998 enrollment of 21,875 students. Differences in attitude toward the desirability of various types of housing fostered by this university setting might be reflected by differences in property values. The data used in the study were 1997 and 1999 tax appraisals. These data resulted in approximately 85,000 computable property appreciation rates for Montgomery County and 45,000 appreciation rates for Lee County.

For each county, the data were divided into land parcels on which a manufactured house was located and properties on which there was a site-built house. This procedure revealed 1,128 plats coded as containing a

manufactured dwelling on the parcel in Montgomery County and 2,987 plats coded as containing a manufactured dwelling on the parcel in Lee County. The addresses of both the manufactured parcels and site-built parcels for each county were referenced against a standard street map to obtain the samples for the study. This geo-coding process resulted in a sample of 303 identifiable locations for manufactured dwellings and 23,871 site-built locations in Montgomery County. The corresponding geo-coded sample size for Lee County was 157 and 8,092 locations.

A series of concentric rings were drawn around each manufactured house. The appraised value and appreciation rate of all site-built properties located within the rings was then recorded. Average property values and average appreciation rates were computed for these samples. If proximity to manufactured housing has a negative impact on the value of site-built housing, it would be expected that the appraised values and appreciation rates of site-built housing located within the greater-distanced rings would be higher.

This sampling procedure and methodology are similar to the approach of Shen and Stephenson (1997), with two modifications. The first is the treatment of concentric rings as defining distance of site-built structures from a manufactured home. For scattered (individual) housing, Shen and Stephenson measured proximity starting at a distance of 100 feet using 100-foot increments to a distance of 800 feet.¹ The present study

measures the proximity of individual manufactured dwellings at distances of fewer than 250 feet, 250 to 1,250 feet, 1,250 to 2,500 feet, 2,500 to 5,000 feet, and greater than 5,000 feet. The feeling is that the 100-foot increments used by Shen and Stephenson are too small to capture any differential impact of distance from manufactured housing on site-built property value. The choice measures impact at the ¼ mile, ½ mile, one mile, and greater-than-one-mile radiuses. In addition, the distance of fewer than 250 feet is included as a proxy for "within eyesight."

A second difference between this study and that of Shen and Stephenson is the use of two types of averages in summarizing average property values and appreciation rates. In addition to computing simple arithmetic average appreciation rates as in previous studies, the present research computes average appreciation rates weighted by property value. Suppose there is a sample X_1, X_2, \dots, X_N of appreciation rates for properties within a given distance of the manufactured housing unit. The arithmetic average of this sample is

$$\bar{X} = \frac{X_1 + X_2 + \dots + X_N}{N} \quad (1)$$

The weighted average appreciation rate is

$$\bar{X}_w = W_1 X_1 + W_2 X_2 + \dots + W_N X_N, \quad (2)$$

where

$$W_j = \frac{V_j}{\sum_{i=1}^N V_i} \quad (3)$$

and V_j is the 1997 appraisal value for property j .

When there are N appreciation rates in the sample, the arithmetic average assigns a weight of $1/N$ to each of these appreciation rates. The weight assigned to each appreciation rate in the weighted average is the fraction that the property value makes to the total of the 1997 evaluations in the sample. Comparing the weighted average to the arithmetic mean is a way of determining whether high or low valued site-built properties are impacted more by proximity to manufactured housing.

Results

The results for Montgomery County are displayed in Table 1. Lee County's findings appear in Table 2.

Montgomery County

Table 1 shows that the average appraised value of a manufactured house ranged between \$19,000 and \$20,000 over the 1997-1999 period. Over the same period, site-built property displayed a somewhat wider range of values. For 1997, site-built values ranged from an average value of \$27,734.42 for those properties

within a radius of fewer than 250 feet from a manufactured house to \$69,004.99 for site-built properties greater than 5,000 feet from a manufactured dwelling. For 1999, site-built values ranged from an average value of \$28,466.64 at the 250 foot radius to a \$73,054.16 average value at the greater than 5,000-foot distance.

Table 1 also shows the annual and weighted annual appreciation rates of the properties over the 1997-1999 period. Several things are apparent from Table 1. First, all properties appreciated over this horizon. Manufactured housing units appreciated at an

TABLE 1
VALUE OF MANUFACTURED AND SITE-BUILT HOMES—MONTGOMERY COUNTY

Manufactured Homes	Sample Size	1997 Appraised Value	1999 Appraised Value	Annual Appreciation	Weighted Annual Appreciation
Total Sample	303	\$19,317.33	\$20,093.89	3.32%	2.01%
Site-Built Homes					
Total Sample	23,871	\$53,605.29	\$56,772.82	3.66%	2.95%
Fewer than 250 feet from Manufactured	658	\$27,734.42	\$28,466.64	1.22%	1.32%
251 - 1,250 feet from Manufactured	2,284	\$31,959.00	\$33,620.25	3.77%	2.60%
1,250 - 2,500 feet from Manufactured	3,159	\$36,967.49	\$38,863.94	2.56%	2.57%
2,500 - 5,000 feet from Manufactured	6,690	\$45,891.28	\$48,952.62	4.61%	3.34%
Fewer than 5,000 feet from Manufactured	12,791	\$40,265.54	\$42,669.37	3.78%	2.98%
Greater than 5,000 feet from Manufactured	11,080	\$69,004.99	\$73,054.16	3.51%	2.93%

TABLE 2
VALUE OF MANUFACTURED AND SITE-BUILT HOMES—LEE COUNTY

Manufactured Homes	Sample Size	1997 Appraised Value	1999 Appraised Value	Annual Appreciation	Weighted Annual Appreciation
Total Sample	157	\$34,958.28	\$43,878.08	13.06%	12.76%
Site-Built Homes					
Total Sample	8,092	\$63,217.95	\$75,533.22	17.80%	9.74%
Fewer than 250 feet from Manufactured	667	\$64,628.05	\$76,329.16	29.29%	9.05%
251 - 1,250 feet from Manufactured	2,233	\$47,844.13	\$58,495.09	21.88%	11.13%
1,250 - 2,500 feet from Manufactured	2,475	\$59,919.60	\$71,184.92	14.73%	9.40%
2,500 - 5,000 feet from Manufactured	2,103	\$75,156.26	\$89,965.83	14.04%	9.85%
Fewer than 5,000 feet from Manufactured	7,478	\$61,018.65	\$73,136.12	17.97%	9.93%
Greater than 5,000 feet from Manufactured	619	\$89,600.66	\$104,194.57	15.48%	8.14%

average annual rate of 3.32 percent over this period. Site-built properties ranged in appreciation rates from a 1.22 percent annual average appreciation rate for those properties within 250 feet of a manufactured structure to 4.61 percent appreciation for those properties between 2,500 and 5,000 feet of a manufactured dwelling.

Second, in two instances little, if any, difference between the weighted annual appreciation rate was found. This occurred for site-built dwellings at a distance of fewer than 250 feet from a manufactured home and for site-built dwellings between

1,250 and 2,500 feet of a manufactured structure. However, when a difference between the two appreciation measures did occur, the annual appreciation rate, weighted by property value, was lower. This difference occurs when higher valued property appreciates at a slower rate than lower valued property.

Lee County

Table 2 shows that in 1997 the average appraised value of a manufactured dwelling in Lee County was \$34,958.28. By 1999, the average appraised value of manufactured housing in Lee County increased to

\$43,878.08. This resulted in an average annual appreciation rate of 13.06 percent and a weighted average annual appreciation rate of 12.76 percent. These appreciation rates and property values are somewhat higher than those in Montgomery County. This difference may be due in part to demographics, with Lee County's large university-related population. The difference in appreciation is also due in part to Lee County having undertaken a major property reappraisal in 1998, which is spanned by the 1997-99 sample period.²

Site-built property ranged in value in 1997 from an average

of \$47,844 for those properties between 250 and 1,250 feet of a manufactured dwelling to \$89,600.66 for properties further than 5,000 feet from a manufactured structure. By 1999, site-built properties ranged in value from \$58,495.09 to \$104,194.57.

Appreciation rates for site-built structures in proximity to manufactured housing exhibited a wide range of values. Average annual appreciation rates for site-built properties ranged from 14.04 percent for those properties between 2,500 and 5,000 feet of a manufactured dwelling to 29.29 percent for those properties located fewer than 250 feet from a manufactured unit. In all instances, the weighted average

annual appreciation rate was less than the unweighted average annual rate. However, the weighted annual appreciation rate displayed a much narrower range of values, varying between 8 and 11 percent. This disparity can again be attributed, in part, to Lee County having undertaken a major property evaluation in 1998.

Relationship between the Value of Site-Built Housing and Distance from Manufactured Housing

What do Tables 1 and 2 tell us about the relationship between appreciation of site-built property and proximity to manufactured housing? The answer for Lee County is that no relationship appears to exist.

For Montgomery County, the answer is strikingly different. Although the increase in the appreciation rate of site-built properties was not steady as distance from manufactured property increased, the lowest 1997 appraised value, lowest 1999 appraised value, and lowest appreciation rate for site-built property in Montgomery County were for properties within 250 feet of a manufactured structure. T-tests for the difference between the sample mean of each property classification and the mean of site-built properties within 250 feet of a manufactured dwelling were conducted for Montgomery County. The results of these tests appear in Table 3.

TABLE 3
DIFFERENCES IN MEAN VALUE OF VARIOUS PROPERTY CATEGORIES
IN MONTGOMERY COUNTY

Comparison	1997 Property Value	1999 Property Value	Annual Appreciation Rate
Manufactured Minus Site-Built within 250 feet of Manufactured	-\$8,417.10 t = -5.82 More than 99% sig	-\$8,372.75 t = -5.5 More than 99% sig	2.10% t = 1.28 Not Significant
Site-Built 250 to 1,250 feet Minus Site-Built within 250 feet of Manufactured	\$4,224.57 t = 3.02 More than 99% sig	\$5,153.61 t = 3.5 More than 99% sig	2.55% t = 1.69 95% sig
Site-Built 1,250 to 2,500 feet Minus Site-Built within 250 feet of Manufactured	\$9,233.07 t = 4.98 More than 99% sig	\$10,397.30 t = 5.35 More than 99% sig	1.34% t = 2.57 More than 99% sig
Site-Built 2,500 to 5,000 feet Minus Site-Built within 250 feet of Manufactured	\$18,156.86 t = 17.76 More than 99% sig	\$20,485.97 t = 19.1 More than 99% sig	3.39% t = 5.71 More than 99% sig
Site-Built More than 5,000 feet Minus Site-Built within 250 feet of Manufactured	\$41,270.56 t = 39.07 More than 99% sig	\$44,587.52 t = 40.54 More than 99% sig	2.29% t = 9.81 More than 99% sig

The tests show that site-built properties within 250 feet of a manufactured dwelling were appraised at lower values and, on average, appreciated at lower rates than site-built homes at other distances and, with the exception of the appreciation rate of site-built properties at the 250-foot to 1,250-foot radius, these differences were all significant at the 99 percent level. What is even more striking is that this significance level, measured by the value of the t-statistic, increases as the average distance from manufactured housing increases. This finding is important because none of the previous studies found a significant negative impact of proximity to manufactured housing and the value of site-built property.

Conclusions

Despite recent increases in quality manufactured housing, there remains the belief that proximity to a manufactured dwelling decreases the value of site-built properties. However, evidence has not yet been found to support this notion. The present study's results run counter to the findings of existing studies by showing that site-built properties located in close proximity to manufactured housing do, in fact, appreciate at lower rates than other site-built housing.

The present study used 1997 and 1999 property evaluations from Montgomery County, Alabama, and Lee County, Alabama, to assess the impact of proximity to manufactured

housing on site-built property value. Weighted average annual appreciation rates, as well as average annual appreciation rates, were calculated.

The results of the present study demonstrate that although there appears to be no negative impact of proximity to manufactured housing on the appreciation rates of site-built housing in Lee County, such a negative impact does exist in Montgomery County. In particular, site-built residential properties located within 250 feet of a manufactured dwelling appreciate at significantly lower rates than other site-built housing.

Managerial Implications

The managerial implications of the present study are not in the findings per se, but in the methodology employed. The study used a geographic information system to locate properties on which manufactured structures were situated and to identify property values of site-built structures within specified distances of the manufactured structures.

Similar methodology could be used to aid managers. For instance, a marketing manager confronting the task of choosing the location of a retail outlet could use a Geographic Information System to identify potential store locations. For each location, the GIS could be used to identify competitors within a given geographic distance. Similarly, a GIS could be used to identify demographic characteristics of potential

customers. This latter type of analysis works well since the United States Bureau of Census provides demographic data by postal zip code, and the postal zip code is part of the standard address format used by most Geographic Information Systems.

Although GIS has been used in city and environmental planning for nearly a decade, its use in business decision making is probably still in its infancy. The authors hope that the present study will encourage managers to explore Geographic Information Systems and their possibilities.

Endnotes

1. Shen and Stephenson also measured the impact of distance from manufactured housing communities at distances ranging from 1,500 to 9,000 feet in increments of 1,000 feet from an approximated center of the housing cluster. Since the databases used in the present study only include addresses of property owners, and since traditional trailer parks in the Alabama counties studied contain only rental units, our study does not attempt to identify the impact of manufactured housing clusters on adjacent property values.
2. Lee County operates on a cycle undertaking a major property evaluation every five years while making only minor adjustments in the interim. Montgomery County continually appraises property values each year.

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