

A HEDONIC PRICE COMPARISON OF MANUFACTURED AND SITE-BUILT HOMES

by

ANNA ELIZABETH RIVENBARK

(Under the Direction of Anne L. Sweaney)

ABSTRACT

Manufactured homes are becoming increasingly popular in America as a way of achieving the dream of homeownership. The purpose of this paper is to compare the prices home buyers pay for structural, locational and neighborhood characteristics of manufactured homes compared to site-built homes. Data from the 2001 American Housing survey are used in this study. Rosen's (1974) hedonic price hypothesis served as the theoretical framework. Two models were developed using homeowners of site-built homes as one sample and homeowners of manufactured homes as the other sample. Eighteen variables covering structural, locational, and neighborhood characteristics of housing were selected and used in regression analyses. The findings show that many of the same characteristics that affect the price of site-built homes are the same characteristics that affect the price of manufactured homes. Specifically, structural characteristics have the largest effect on the purchase prices of homes. This means that consumers value structural characteristics over locational and neighborhood characteristics.

INDEX WORDS: Hedonic price index, Manufactured housing, Affordable housing, Housing quality, Housing characteristics, American Housing Survey, HUD Code.

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ANNA ELIZABETH RIVENBARK

B.S.F.C.S., The University of Georgia, 2001

A Thesis Submitted to the Graduate Faculty of The University of Georgia in Partial Fulfillment
of the Requirements for the Degree

MASTER OF SCIENCE

ATHENS, GEORGIA

2003

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ANNA ELIZABETH RIVENBARK

Major Professor: Anne L. Sweaney

Committee: Julia Marlowe
Jorge Atilas

Electronic Version Approved:

Maureen Grasso
Dean of the Graduate School
The University of Georgia
December 2003

DEDICATION

I dedicate my thesis first to my brother, Lane. He is the apple in my fruit salad, the hem in my jeans, the windshield wiper fluid in my car; in essence, without him, nothing is quite right. Second, I dedicate this to my mother who spent endless hours with both of us listening, complaining, shopping and laughing. Last, I dedicate this to my father who understands that working late is sometimes the only option and that you get through the best you can. Thank you all for having faith in me and supporting me through this step in life.

ACKNOWLEDGEMENTS

Thank you to my major professor, Dr. Sweaney, for all of her guidance and support as a part of my team. Also thank you to my committee members, Dr. Marlowe and Dr. Atilas, for helping me complete this task. My thanks go to Nikki Williams, Linda Toney and Susan Brooks for putting up with my constant presence and for being my friends. And finally, thank you to Dr. Joan Koonce-Moss for just listening. I could not have done this without any of you.

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CHAPTER 1

INTRODUCTION

The typical “American Dream” is to own a home. Housing and Urban Development Secretary Mel Martinez stated “Home ownership inspires civic responsibility, offers children a stable living environment and generates economic benefits for families and communities” (PR Newswire, 2002, p.1). Other benefits of home ownership include pride of ownership, security of tenancy, privacy, financial predictability, equity build up, investment appreciation, tax benefits, and even decorating freedom (Yeats & Cromie, 2003).

Home ownership of traditional site-built homes is often unaffordable to many segments of the populations. Manufactured housing could be an affordable alternative but little research exists about what characteristics consumers of manufactured homes want and what they are willing to pay for these characteristics.

Research Purpose

The purpose of this paper is to compare the prices home buyers pay for structural, locational and neighborhood characteristics of manufactured homes compared to site-built homes. Do certain types of characteristics affect the purchase price of homes more than other types of characteristics? This question is important to answer in order to understand what characteristics consumers are primarily interested in when purchasing a home and whether there are differences depending on the type of home purchased.

Manufactured homes are defined as homes that are built to the standards set forth in the Manufactured Home Construction and Safety Standards and labeled as such. They

are built in factories and transported to a location on a permanent chassis (U.S. Department of Housing and Urban Development [HUD], n.d.a.). Site-built homes are defined as conventional homes which are built on the site, with the exception of some parts such as the roof, wall panels and door frames (U.S. Census Bureau, 2002c).

Structural, locational, and neighborhood characteristics common in homes will be evaluated using a hedonic price index to determine the prices paid for different housing characteristics in both manufactured and site-built homes. The hedonic price index is a common tool used in this type of study. Hedonic analysis stems from theory developed by Lancaster (1966) and expanded upon by Rosen (1974). Based on the theory, a house is composed of a bundle of characteristics and its price is a function of the characteristics in that bundle. A house is purchased when it contains the optimal bundle of characteristics based on tastes and preferences within the budget restraint. Essentially, a hedonic price index determines the characteristics that are embodied in the homes and then determines the price home buyers are willing to pay for certain characteristics (Ohsfeldt, 1988).

The objectives of the study are:

1. To determine the price home buyers are willing to pay for structural, locational, and neighborhood characteristics embodied in manufactured and site-built homes and how these characteristics affect the overall price paid for the home.
2. To determine which housing characteristics are more valued in the different types of homes.

Justification

The focus on the differences in manufactured housing and site-built housing and their buyers has many implications for today's world. As available land becomes scarcer and price increase faster than incomes, people are less likely to be able to afford housing. Manufactured housing could be the alternative that fills the gap between owning and renting. According to the Wisconsin Manufactured Housing Association Newsletter (2001), Breaking Ground, a site-built home that is equivalent to a manufactured home in terms of size, quality, and set-up can cost up to 20% more. It would be helpful for producers to know what housing characteristics home buyers are demanding and how much they are willing to pay for the characteristics. Since individuals of different demographic backgrounds are now purchasing manufactured housing are changing rapidly, marketing strategies need to be altered to meet their needs (Savage, 1999). This study will provide information that would help marketers reach an audience that was previously not thought to be a part of the market.

Manufactured housing makes up an increasing portion of the housing market. According to recent literature, 22% of the new housing starts are manufactured homes (Manufactured Home Industry Meets Consumer Demand, 1999). Trends suggest that the markets for site-built homes and manufactured homes are overlapping in the first-time homebuyer segment of consumers (U.S. Department of Housing and Urban Development [HUD], 1998c).

The individuals who own manufactured homes have changed recently. Typically, in the United States, owners of manufactured housing are from the South or Southwest, Caucasian and in the lower income brackets. Recently manufactured homes are found

across the country and are being chosen by all types of individuals. Income levels have risen for manufactured homeowners in the past decade as well. Increasingly, retirees are choosing manufactured homes because the homes are more affordable and easier to maintain than traditional site-built homes which makes it easier to downsize or even own a second home (Jovan & Benoy, 1997). As the baby boomers age, it has been predicted that manufactured housing providers will have an increasing market share composed of elderly consumers (Manufactured Housing Institute [MHI], 2001)

In fact, the average age of the owner of manufactured housing is 54.1 years old. Over one-quarter of manufactured housing residents are retired. Most residents have graduated from high school and almost half have had some college (47%). The median income of owners of manufactured homes has risen in past years from \$24,500 in 1996 to \$28,900 in 2002 in 2002 dollars for almost an 18% increase (Foremost Insurance Group, 2002). In comparison, the median income for all households in the United States increased from \$39,869 in 1996 to \$42,228 in 2002 in 2002 dollars for a 5.9% increase (U.S. Census Bureau, 2002b). The rising income level of consumers choosing manufactured housing is an indicator of the increasing acceptance of the homes by home buyers. More and more consumers seem to find manufactured housing to be an appropriate alternative to site-built housing. According to the Manufactured Housing Institute, this trend is likely to continue long into the future (Manufactured Housing Institute, 2003b).

Manufactured housing now comes in multi-section units built with the same materials as site-built homes and filled with the same quality features. They can be L-shaped or even two stories. In fact, they are often indistinguishable from their site-built

counterparts (Shilling, 1996). Furthermore, the design of manufactured housing is continuing to evolve. The Partnership for Advancing Technology in Housing (PATH) is a program within HUD, with the goal of developing affordable housing with more advanced designs (Recent Research Results, 1999). One of PATH's primary objectives is to promote the "Next Generation" of housing in America. Manufactured homes are a large part of the effort to increase the quality, affordability, environmentally soundness, and lasting ability of housing by PATH (U.S. Department of Housing and Urban Development [HUD], 1998a). Older manufactured homes that are traditionally referred to as trailers or mobile homes are quickly being replaced by the higher quality manufactured homes sold today.

The efficiency of the construction has increased in manufactured homes as well because they are built in factories away from inclement weather and other outside factors that affect the construction of site-built homes. Excess waste and hidden costs are also minimized due to the precision of the building process (Shilling, 1996). Manufactured homes can address the struggles of areas experiencing high volumes of sprawl. The concept of New Urbanism addresses sprawl, with one of its solutions being infill. Infill is the concept of reusing lots in a new way to incorporate different levels of commercial and residential activities (Steuteville, 2000). Manufactured homes are perfect for infill areas because they can be set up anywhere and are not subject to the coordination of materials, workers, or any of the other problems associated with building in small areas (U.S. Department of Housing and Urban Development [HUD], 2000).

Studies show that of those consumers who purchase manufactured homes, 90% would buy one again and recommend one to family and friends (Manufactured Home

Industry Meets Consumer Demand, 1999). People often choose manufactured housing over site-built housing because of the affordability, space efficiency, ease of maintenance, and sense of community provided (Murphy, 1993). As manufactured housing increases its role in the housing market, so will the need to understand its differences compared with site-built housing.

As the baby boomers begin to retire, many will want to downsize their housing or even have a second home. Manufactured housing provides low-maintenance, affordable housing that can be energy efficient and can include of the features of a site-built home. In fact, people aged 50-59 make up the fastest growing segment of buyers. Research shows that these consumers are attracted to the affordability of manufactured homes and the lower level of maintenance required (Jovan & Benoy, 1997). A study of older adults and their decisions to purchase a manufactured home instead of a site-built home in an effort to downsize was conducted and the results show that retired adults are likely to purchase smaller, more affordable homes as they age (Defenbaugh, 2000). This is an important segment of the population for the industry to consider in their marketing campaigns.

There are also policy issues at the local level for manufactured housing buyers. With the increase in manufactured housing, housing assessors must make sure that they are valuing the homes at the appropriate prices. Homes that have fixed foundations are considered real property and have been found to appreciate at the same rates as traditional, site-built homes. Studies show that manufactured houses have often been undervalued in the past (Shen & Stephenson, 1997). In addition, many local governments have zoning ordinances that discriminate against manufactured housing

within the city limits or certain areas of a community. When zoning requirements forbid manufactured homes on certain properties, owners of manufactured housing are sometimes forced to move their homes in order to adhere to the law.

However, most manufactured home buyers do not purchase their homes with the intention of moving them from their original location as the former name “mobile home” would have implied. The majority of manufactured homes are never moved from their original location. In fact, according to the Manufactured Housing Institute, fewer than five percent are moved after their original placement (Atkin, 2002). Unfortunately, there are problems associated with the moving of manufactured homes. Individual counties often arbitrarily set an age at which manufactured homes can no longer be moved within the county. This creates problems for those that want to install additions to their homes but cannot bring in the additional section. Advocates of manufactured housing are pushing for pre-owned minimum standards as the criteria for whether a home can be moved, not age (J. Young, personal communication, November 10, 2003).

The financial industry can gain useful information from this study as well. Manufactured home buyers often have difficulty locating affordable financing for their homes. The changes in manufactured housing make it a positive investment for lenders and lending money for manufactured housing increases home ownership rates. Financial markets are beginning to realize the implications of the manufactured home market. Many manufactured homes have been financed in a manner similar to that of an automobile loan. Many homes are financed using chattel loans where the loan does not include the land (Apgar, Calder, Collins, & Duda, 2002). Increasingly, homes are permanently affixed to a particular location on private property where they are considered

real property by lenders and qualify to be financed with a traditional mortgage (Johnson & Scheuer, 1993).

In many states, manufactured homes are considered real property and qualify for home mortgages if they are 1) a multiple-section built after 1976, 2) permanently fixed to the land, 3) the wheels and axles are removed, 4) there is a deed stating the land and the home are one property, and 5) have a shingled roof (Datres, 1991). Manufactured homes could be an untapped market for mortgages and home equity loans. Until lenders are willing to accept manufactured housing as a viable housing choice, home buyers who choose manufactured housing could be at a disadvantage. This paper, in part, is an effort to increase the knowledge of the financial community of manufactured housing so they view it has a viable housing option.

Another important reason for more research on manufactured housing is that not all consumers are satisfied with their experiences with manufactured homes. The National Survey of Mobile Home Owners, conducted by AARP in 1999, found that approximately 77% of manufactured homeowners had a problem with appliances, systems, installation, or construction. Over half (54%) of the problems reported were fixed with the homeowner paying for the repairs. The AARP study did not recognize that many of the problems that homeowners were faced with were being addressed by legislation during the survey period (AARP, 1999). The AARP study is a testament to the need for legislation to improve the quality of this housing product.

The findings in this paper may support the effort to make manufactured housing a legitimate form of housing in all communities by helping the communities gain a better understanding of which characteristics are important in the decision to purchase a

manufactured home. Manufactured housing has to be proven a viable housing option to individuals, communities, government officials, and the financial industry. With a greater understanding of what consumers are looking for in manufactured homes, there is a better chance that the needs of the consumers can be met. This study will compare the prices consumers living in manufactured and site-built homes are willing to pay for structural, locational and neighborhood characteristics.

CHAPTER 2

LITERATURE REVIEW

Through the years, housing research has covered many broad topics. Margaret J. Weber conducted a comprehensive review of the history of housing research in 1992. According to her review, behavioral research was the dominant focus of studies beginning in the 1970's. Field studies have been the primary form of housing study through the years but survey research has become more popular since the late 1980's. A problem with housing research is that it often lags behind current housing issues. In 1992, housing affordability was a major concern but information available was limited. Weber (1992), completed a comprehensive review of housing research and stated that housing affordability would be one of the emerging issues in housing in the near future. According to the Department of Housing and Urban Development (HUD), a house is affordable if its monthly costs are no more than 30% of a household's gross monthly income (U.S. Department of Housing and Urban Development, 1991). Manufactured housing is one answer to the affordability problem but research must be conducted to fully understand its impact.

Affordability

Affordable housing is a major concern in today's society as well. The Fannie Mae Foundation conducted research on the matter in 2002 and found that housing affordability is as much a concern to communities as the unemployment levels. Crime and the environment were found to be less of a concern than affordable housing. According to Hart and Teeter (2002), over three-quarters of renters surveyed (77%) say

one of the primary problems with purchasing a home is finding an affordable home. For those with families, the affordability issue is even more of a problem. In families with children under the age of 18, one-quarter stated that their homes are only slightly or not affordable (Hart & Teeter, 2002).

In response to the affordability problem, communities support policy initiatives such as grants to non-profit organizations that build low to moderate income housing, down payment assistance, and tax credits to for-profit businesses that build low to moderate income housing (Hart & Teeter, 2002). Manufactured homes could be the affordable alternative to site-built homes. Additionally, manufactured homes can provide more features than a site-built home for the same price. The same feature will often cost more in a site-built home (Vickery, 1995). More research is needed to make consumers aware of the advantages of manufactured housing in order for society to view manufactured homes a viable housing alternative.

Government Support of Homeownership

The federal government has recognized the benefits of home ownership and has initiated many policies including the creation of the Department of Housing and Urban Development (HUD). Also created as a part of the government's efforts to increase home ownership, the Federal National Mortgage Association (Fannie Mae) was created and designed to increase home ownership rates by freeing up mortgage money through the secondary mortgage market. Similar government sponsored enterprises (GSE's) commonly referred to as Freddie Mac and Ginnie Mae were created due to the huge success of Fannie Mae and to provide some competition for Fannie Mae. These GSE's eventually formed the secondary mortgage market. The secondary mortgage market

works by having Fannie Mae and the other organizations purchase mortgages from lenders. Money is freed up from the lenders' sale of the mortgages and is then available to new borrowers to obtain mortgages (Fannie Mae, 2003). To further encourage home ownership, Congress passed laws that offered tax incentives to homeowners to make home ownership more beneficial (Hood, 1998). With the government in constant search for ways to increase home ownership rates, manufactured housing could be the affordable alternative for which they are looking. Manufactured housing could bridge the gap between owning and renting.

Perceptions of Manufactured Housing

Manufactured housing has long lived with the stigma of being trailers located in unclean portions of town with “trashy” residents. As far back as 1982, Thomas Nutt-Powell saw the potential for manufactured housing as a viable housing alternative to the more traditional site-built home. Manufactured housing continues to struggle with the same problems discussed in his book, *Manufactured housing: Making sense of a housing opportunity* (1982). Nutt-Powell (1982) discusses production and quality, poor perceptions, changes in financing, consumer concern, and a host of other topics associated with manufactured housing.

The poor perceptions associated with manufactured housing, however, are beginning to change due to the increased quality of manufactured housing. Manufactured homes are factory built homes that are required to meet HUD standards according to the Federal Manufactured Home Construction and Safety Standards of 1974, or HUD Code (U.S. Department of Housing and Urban Development [HUD], n.d.a.). The Manufactured Housing Improvement Act was enacted in 2000 as a way to support the

manufactured housing industry by providing a way to improve standards more efficiently (Manufactured Housing Institute, 2003a). As a part of this act, a committee was established to meet at least every other year in an attempt to keep the HUD Code more relevant. HUD also received additional resources to use toward updating the HUD Code but with these resources comes the responsibility of enacting programs in a timely manner (Connecticut Manufactured Housing Association, n.d.a.). The passing of this act shows the commitment of federal policy makers in supporting the industry in order to increase home ownership.

Manufactured housing is an affordable alternative for low to moderate-income families. While communities recognize manufactured housing as affordable, they also suffer from the phenomenon known as Not In My Back Yard (NIMBY). The perceptions of manufactured housing were studied in non-metropolitan counties in Virginia. Findings from this study indicate that residents of manufactured housing are satisfied with it as a housing alternative but non-residents are not accepting. By not accepting manufactured housing as a viable housing option, the non-residents are imposing restrictions on the location of manufactured housing. The image of the manufactured homes has a strong influence on how communities feel about manufactured housing. Non-residents essentially base their NIMBY attitudes on older units which are very dissimilar to the units available today (Beamish, Goss, Atilas, & Kim, 2001).

An additional study conducted in rural Virginia found that people were more likely to accept manufactured homes in their communities if they were double-section instead of single-section homes. The study also found that if people believed that the residents of manufactured homes behaved negatively, the respondents were less likely to

accept manufactured housing (Atiles, Goss & Beamish, 1998). Another study found that in counties where there was a higher percentage of manufactured homes, residents of non-manufactured home were more accepting of the manufactured homes. Conclusions were drawn that the higher percentage leads to greater familiarity and therefore a better understanding and greater acceptance (Atiles, 1995). Local policy often reinforces or contributes to the negative images of manufactured housing. Often, homes are required to be placed in parks rather than sub-divisions. This keeps the homes out of traditional residential areas. Fortunately, many areas are realizing the positive attributes of manufactured housing and are removing the restrictions (Beamish, Goss, Atiles, & Kim, 2001). Managers of manufactured home communities are working to improve the image of the industry as well. Leaders have been enrolling in training courses and attending meetings to set standards for the future (Allen, 1994). The poor perceptions of manufactured housing remain for many residents who are faced with problems of valuing their homes.

Assessing the Value of Homes

Assessing the value of manufactured housing is the focus of a report from the Manufactured Housing Research Project (Warner & Scheuer, n.d.a.). The purpose of the study was to determine if manufactured homes appreciate when sold a second time. The study included 455 manufactured homes that were sold a second time between 1987-1990 and found that the majority (240), when sold again, sold for more than their original value. Two hundred homes sold for less than their original purchase price. The results of this study indicate that the value of the homes when sold a second time are subject to the supply and demand as with any other type of housing (Warner & Scheuer, n.d.a.).

Studies focusing on the effect of manufactured housing on adjacent site-built homes have been a popular topic as of late. Neighbors sometimes fear that manufactured housing will reduce the value of adjacent site-built homes. Though there have been relatively few studies done on the topic, they consistently find that manufactured housing does not have a negative impact on the property values of adjacent site-built homes. Gruber, Shelton, and Hiatt, (1988); Shen and Stephenson, (1997); and most recently Hegji and Mitchell (2000) all found similar results and each study were done in a small number of counties, no more than four. Statistical averages were computed for comparison purposes. However, the misconception that manufactured housing reduces property values still remains. This misconception is most likely due to the fact that many of the newer, more advanced, manufactured housing is placed near older mobile homes that do not meet the same standards as current homes (Hegji & Mitchell, 2000). Property assessors need more information on the new manufactured homes to help dissolve this negative image of manufactured housing.

Energy Efficiency

Energy efficiency is one of the major selling points of manufactured housing. New construction, both residential and commercial, and additions are built to the Model Energy Code (MEC) set forth by the U.S. Department of Energy. This code is a set of criteria for energy efficiency in the structural, mechanical, and electrical systems of the home (U.S. Department of Energy, 1999). While the MEC is an effort to increase the energy efficiency of all buildings, many manufactured homes are opting to make a greater effort to increase energy efficiency. Manufactured homes can be labeled with the ENERGY STAR[®], which requires that the home is at least 30% more energy efficient

than a home built according to the Model Energy Code. The efficiencies are seen in the heating, cooling and water heating systems (Manufactured Housing Research Alliance, 2001). This increased efficiency is a defining characteristic of manufactured housing.

A study was done on the electricity consumption in manufactured housing using a database containing billing cycles for March 1985 through February 1986. Berg and Taylor (1994) found that the increased energy efficiency of manufactured housing only lasts for a period of about three years before deterioration. Apparently the energy efficiency decreases due to the insulation, placement of appliances, and age of the home (Berg & Taylor, 1994). However, the study was done using data collected prior to the ENERGY STAR® program, which was introduced in 1992 (U.S. Department of Energy, 1999). Carolyn Turner (1998) also conducted a study including efficiency as a variable in a study on satisfaction of manufactured housing. She found that consumers are pleased with manufacturers' efforts to increase the efficiency of the homes and that they have noticed significant savings. Further research needs to be done to determine the true effect of energy efficiency on satisfaction with manufactured housing.

Variable Selection

A comprehensive review of a hedonic price index and its application to housing was completed by Chin and Chau in 2003. The hedonic price hypothesis considers goods to be made up of characteristics and the optimal bundle of characteristics is purchased by the consumer. The price of a good changes as the characteristics embodied in the good change. Through regression analysis, the effect each characteristic has on price can be determined (Chin & Chau, 2003). Chin and Chau (2003) discuss the theoretical framework surrounding the index as well as empirical issues and variable selection. The

misspecification of variables is a common occurrence when using a hedonic price index with housing. Irrelevant variables could be included which causes inefficient results. Omitting relevant variables causes the coefficients to be biased (Chin & Chau, 2003). Because of this, variable selection is very important. This review discusses the success of studies that divide the variables into three categories: structural, locational, and neighborhood.

When selecting variables for a hedonic price index, Butler (1982) states “all characteristics relevant to the determination of market price-i.e., those that both yield utility to the residents and are costly to produce-should be included (p. 97)”. He continues by saying that the inclusion of all of the characteristics is not always possible due to lack of data. He found that the omission of some of the variables has little effect on the bias of the coefficients (Butler, 1982). When selecting variables the data need to be considered as does the effect of omitting variables in the equation. The following is a discussion of variable inclusion in past studies.

In housing search studies, consumers search for a home with the desired characteristics until satisfied. Search behavior complements the hedonic hypothesis. As mentioned before, hedonic indexes for housing are comprised of structural, locational, and neighborhood characteristics, with the researcher focusing on the impact of a specific type of variable. Knowing what characteristics are important and what the costs of these characteristics are is important in lowering information search costs (Kim, 1992). Li and Brown (1980) classified variables into three groups as well in their study of neighborhood externalities using a hedonic price index. They use aesthetic attributes which contain the neighborhood quality aspect of housing. The second and third groups

of variables were pollution levels and proximity to the Central Business District, which can be classified under locational variables (Li & Brown, 1980). This study showed that different kinds of variables need to be included in a study of housing price.

Li and Brown's study, along with a host of others (Blackley & Ondrich, 1988; Cheshire & Sheppard, 1995; Jagun & Brown, 1990; Janssen & Soderberg, 1999; Linsley, 1990; MacDonald & Veeman, 1996; Mason & Quigley, 1996; and Newsome & Zietz, 1992), used some combination of a selected number of the variables. These variables included location, size, price, monthly cost, square footage, age of home, bedrooms, bathrooms, garage, fireplace, water source, structure quality, neighborhood quality, schools, kitchen, race, and income.

Structural Variables

Assessing the value of homes is an important issue for both manufactured and site-built homes. One study by Rutherford and Thomson (1999) compared the determinates of housing value for manufactured and site-built homes. The researchers utilized a hedonic price index using a log-linear form. In their study, Rutherford and Thomson (1999) used multiple listing service (MLS) data from Tarrant County, Texas from July 1992 through December 1997. One limitation of the study was that the sample did not provide a large number of manufactured homes. However, the findings indicate that there are many differences between the characteristics typically embodied in manufactured versus site-built homes. Variables included square footage, age of home, bedrooms, fireplaces, parking (garage or carport), bathrooms, and location. The study calls for further research using a larger sample of manufactured housing to compare with traditional, site-built homes. One indication of the study is that the understanding of

pricing for housing to better assess the values of site-built and manufactured homes (Rutherford & Thomson, 1999).

Ohsfeldt (1988) investigated the demand for housing using the hedonic price index as well. Using data from the Annual Housing Survey from 1974-1979, he used the number of rooms, number of bathrooms, and structural quality as structural independent variables. Each of these variables had a positive effect on the price with the exception of additional bathrooms, which had a negative effect in some cases (Ohsfeldt, 1988).

Atkinson and Crocker (1992) tested the transferability of housing hedonic indexes. The study found that structural attributes are more exchangeable than neighborhood characteristics, and therefore are more uniform across housing markets. The structural variables used in the study included age of the home, square footage, and the lot size (Atkinson & Crocker, 1992).

In a study of urban black adults and residential satisfaction, a well-kept yard was shown to have a positive effect on the satisfaction levels of the residents and on the price of the homes. Jagun and Brown (1990) also conducted the analysis using different types of housing units, which showed that a single family home, which is likely to have a yard, is much more desirable than apartments or other multi-family dwellings (Jagun & Brown, 1990).

Locational Variables

According to the literature, locational variables are an important part of the housing purchase decision. Locational variables can include views from the home, distance to employment, or even proximity to airports or nuclear plants.

In Blackley and Ondrich's (1988) study of modeling discrete and continuous housing characteristics, distance from the central business district (CBD) was the key locational variable. The number of bedrooms, square footage, and neighborhood quality were also used as indicator variables. As income increased for those sampled, the distance to the CBD was found to be less important, however, this finding may be a reflection of the quality of housing found farther from the CBD (Blackley & Ondrich, 1988).

Using data from two cities in England, Cheshire and Sheppard (1998) found that location of housing is a pertinent variable to include in the study. The price of land differs from city to city and therefore can be an important factor in the purchasing decision and can be a significant portion of the purchase price (Cheshire & Sheppard, 1998). Rutherford and Thomson, (1999) also included location as a dummy variable in their study. The proximity to a lake as a regressor was also used in their hedonic model. The results indicated that mobile homes are more likely to be located near a lake and are generally on larger properties (Rutherford & Thomson, 1999). Another study focusing on the value of an ocean view found that its presence had a positive effect on the value of the home. As the quality of the view increased, so did the value of the home. The hedonic price was used as the theoretical framework and the researchers stressed that dummy variables commonly used do not account for varying degrees of quality in the location. As with many of the other studies, other types of variables were included but were not the focus of the study (Fraser & Spencer, 1998).

Housing is not just made up of desired characteristics. When home buyers purchase a home they not only purchase the good, but the bad as well. Four studies were

found that discussed the need to include negative characteristics in a hedonic price equation. Espey and Lopez (2000) studied the impact of airport noise on residential property values. They found that airport noise had a negative effect on the value of the homes. These findings were opposite of a study carried out in Manchester, which found that the closeness of the airport to be an amenity (Tomkins, Topham, Twomey, & Ward, 1998).

Warren Rogers (2000) studied homes that were sold before a contamination of the land was discovered and compared the change in the property values. He found that environmental disamenities have a negative effect on property values and need to be included in assessments. Interesting enough, Clark and Michelbrink (1997) found that housing near nuclear power plants did not lose value due to the proximity to the plants. Another study focused on the effect that traffic noise has on house values. According to the results, traffic noise has a negative effect on the value of residential property (Wilhelmsson, 2000). These studies show the necessity of including presumably negative characteristics in the hedonic price equation.

Other studies included location as one of the variables in determining housing values. These included Shen and Stephenson, 1997; Ohsfeldt, 1988; Mason & Quigley, 1996; and Blackley and Ondrich, 1988.

Neighborhood Variables

Neighborhood characteristics have been included in numerous studies of housing value. Cheshire and Sheppard (1998), who studied housing in Britain, used neighborhood as a regressor as well as location. Using data from two cities in Britain in the hedonic price function, they determined that a convenient location of the home and

positive neighborhood characteristics are important in assessing the value of the home (Cheshire & Sheppard, 1998). The focus of another study was where the home was located in relation to schools, parks, shopping, main roads, and other amenities (Fraser & Spencer, 1998).

Clark and Herrin (2000) found that while controlling for other housing characteristics, public schools had a significant effect on the housing price. The schools were found to be more important than crime and the environment (Clark & Herrin, 2000). Along with this study, many others use neighborhood characteristics as regressors but do not focus their research efforts on the specific variables. For instance, Atkinson and Crocker (1992) not only used neighborhood characteristics, but also structural characteristics such as age, lot size, and property taxes. Kim's 1992 study also used structural characteristics such as number of bedrooms and bathrooms, parking availability, presence of a fireplace, and central air conditioning. A long list of variables were included in Rutherford and Thomson's (1999) research. In addition to the neighborhood variables, Rutherford and Thomson used structural variables such as number of rooms, lot size and the use of a garage. The type of financing and length of time on the market were also considered. Ohsfeldt (1988) studied housing using many structural variables but refrained from using locational variables.

Life Cycle Variable

Although the stage in the life cycle does not affect the value of the home, housing purchase decisions must meet the needs of the home buyers and their current stage in the life cycle. To determine if there is any effect associated with a household's stage in the life cycle, especially when children are present, a variable will be included in this study

for descriptive purposes. According to the literature, the life cycle is composed of four broad stages: childhood and adolescence, early adulthood, middle adulthood, and later adulthood (Levine, 1987). As families progress through the different stages of the life cycle they alter their purchasing habits. Segmenting the population based on the particular stage in the life cycle of a family can yield a better understanding of their buying behaviors (Pol & Pak, 1995). Using the Family Life Cycle (FLC) theory, a variable will be used in this study for descriptive purposes which accounts for the stage in the life cycle.

A study of consumer expenditures was done using the FLC theory to analyze whether the stage in the life cycle alters consumer purchases. Researchers divided the stages into eight levels: husband-wife only; husband-wife, oldest child less than six years; husband-wife, oldest child age 6-17; husband-wife, oldest child 18 or over; husband-wife, other relative; single parents, at least one child under age 18, single person; and other household. The shortcomings of some of the measures were recognized and researchers recommended further divisions for single parents with children and divisions accounting for age in the single and other household categories (Pol & Pak, 1995).

Theoretical Framework

The theoretical framework for the study proposed here is derived from demand theory. According to economic theory, demand is a function of price, income and tastes or preferences (Friedman, 1976). Consumers make their purchasing decisions based on the prices of the good, their income and their tastes regarding the good. When looking at the behavior of an individual consumer, economists assume that the individual is

deliberately making choices that will help achieve maximum utility or satisfaction (Friedman, 1976).

An extension of this theory is Lancaster's characteristic model (1966). Lancaster's approach differs from demand theory in that it does not consider goods as the sole source of utility but, instead, proposes the idea that utility is actually derived from the characteristics embodied in the goods (Lancaster, 1966). Consumer preference is for the characteristics embodied in goods instead of the goods themselves. Therefore, the characteristics provide the consumer with satisfaction rather than the good itself. A good can contain multiple characteristics and consumers purchase goods that have the optimal bundle of characteristics desired (Lancaster, 1966).

Arising from Lancaster's characteristic model is Rosen's (1974) hedonic hypothesis. Rosen presented the hedonic hypothesis that "goods are valued for their utility-bearing attributes or characteristics" (p. 34). Using this hypothesis he developed hedonic prices which are implicit prices that are estimated by regressing the characteristics on the product price in the price index (Rosen, 1974). Studies have used hedonic price indexes to determine the effect of land, negative externalities, and location on the price of housing. These studies used similar variables and then included the variable of interest. There can be many variables to encompass all of the characteristics considered when purchasing a home. According to Atkinson and Crocker (1992), the hedonic theory predicts that the prices determined for neighborhood characteristics will be less transferable than the prices determined for structural characteristics. In other words, the prices consumers pay for characteristics in the home carry across location and

time but prices paid for neighborhood characteristics, views, and location would not hold because of the lack of homogeneity of housing location (Atkinson & Crocker, 1992).

In many studies utilizing hedonic prices as a theoretical basis, it is common to see more than twenty characteristics included in the regression analysis. Most goods that are analyzed contain many characteristics that may contribute to the overall price of the good and yield different levels of satisfaction for the consumer. The high number of variables can make the equations quite complex. Ohsfeldt (1988) suggests using factor analysis to lower the number of characteristics to a set of factor scores that can be considered composite characteristics (Ohsfeldt, 1988). Although Ohsfeldt has a valid point, single characteristics can be pertinent in the consumer's mind. Although keeping the characteristics separate is complicated, it does allow for a more accurate picture of what consumers are actually demanding and paying. In short, a hedonic index is an attempt to determine the price of the individual characteristics.

Application of Theory

The study will use demand theory to determine the demand for manufactured and site-built homes with various characteristics. The price of the home is the dependent variable, with consumer characteristics and structural, locational, and neighborhood characteristics as the independent variables. According to demand theory, demand is a function of the price of housing, the consumer's income, and the characteristics of the structure, neighborhood, and location as shown below.

$$D=f(P, I, C_s, C_l, C_n), \text{ where}$$

P = purchase price of the home

I = income

C_s = Structural characteristics (structure type, age of home, number of rooms, bedrooms, bathrooms, half bathrooms, square footage, garage/carport, central air conditioning, cost of electricity)

C_l = Locational characteristics (waterfront property, distance to commercial activity, distance to work.)

C_n = Neighborhood characteristics (recreation available, community services, crime, police protection, noise.)

The demand equation will be broken down further in this study. The price of a site-built home will be used in one equation, while the price of a manufactured home will be used in another. The price of both manufactured and site-built homes are functions of the characteristics of the structure, location and the neighborhood.

Therefore, the equations for this study become

$$D = f(P_{sb}, I, C_s, C_l, C_n), \text{ and}$$

$$D = f(P_{mh}, I, C_s, C_l, C_n), \text{ where}$$

P_{mh} = purchase price of manufactured home

P_{sb} = purchase price of site-built home

Research Hypotheses

From the literature the following hypotheses were developed:

H_1 : Structural characteristics (the more recent the year the unit was built, lower average monthly cost of electricity, number of full bathrooms in unit, number of rooms in unit, square footage of unit, presence of central air conditioning, and

garage or carport included with unit) will have a positive effect upon the price of site-built homes.

- H₂: Locational characteristics (waterfront property, business institutions within one-half block, metropolitan statistical area, and number of miles traveled to work) will have a positive effect upon the price of site-built homes.
- H₃: Neighborhood characteristics (community recreational facilities available, community services provided, lack of neighborhood crime, satisfaction with police protection, and neighborhood noise not bothersome) will have a positive effect upon the price of site-built homes.
- H₄: Structural characteristics (the more recent the year the unit was built, lower average monthly cost of electricity, number of full bathrooms in unit, number of rooms in unit, square footage of unit, presence of central air conditioning, and garage or carport included with unit) will have a positive effect upon the price of manufactured homes.
- H₅: Locational characteristics (waterfront property, business institutions within one-half block, metropolitan statistical area, and number of miles traveled to work) will have a positive effect upon the price of manufactured homes.
- H₆: Neighborhood characteristics (community recreational facilities available, community services provided, lack of neighborhood crime, satisfaction with police protection, and neighborhood noise not bothersome) will have a positive effect upon the price of manufactured homes.

Data for this study will come from the 2001 American Housing Survey (U.S. Census Bureau, 2002a). This data set is a biannual survey which is conducted

nationally. Table 1 shows the variables and how they are measured by the American Housing Survey.

CHAPTER 3

METHODOLOGY

The purpose of this paper is to compare the prices home buyers pay for structural, locational and neighborhood characteristics of manufactured homes compared to site-built homes. Rosen's hedonic price hypothesis provides the theoretical framework for the study (Rosen, 1974). An analysis of housing characteristics, neighborhood characteristics, and demographic factors will be used to determine what consumers pay for housing characteristics, the related neighborhood amenities and disamenities, and what types of individuals are paying what prices. The research design to study these areas is illustrated in this section. The hypotheses are stated, and data, sample selection, and how the data were analyzed are discussed.

Data

The 2001 American Housing Survey (AHS) data were utilized in this study. Data are collected every two years by the U.S. Department of Commerce, Bureau of the Census for the U.S. Department of Housing and Urban Development (HUD). For the 2001 survey, the data were collected between August and November of 2001. The sample remains the same with the exception of units that no longer qualify until the Census Bureau changes the sample. The Census Bureau changes the sample by rotating a portion of new units. The sample was updated for new construction and a more thorough coverage of housing units for the 2001 survey. The Census Bureau surveys the residents of housing units to obtain the data (U.S. Census Bureau, 2003a).

The 2001 AHS data used the same households as the 1985 AHS data. The households were chosen based on the 1980 census, new construction, units missed in the 1980 census and units added since the 1980 census (U.S. Census Bureau, 2003a). In 2001, approximately 55,700 units were sampled. About 2,100 of those surveyed were not retained in the sample because they did not meet the requirements of the survey or they no longer existed (U.S. Census Bureau, 2003a).

Only 53,600 units were eligible for the survey with a 90% response rate through telephone surveys. The high response rate is due to the fact that many of the panel members have participated in the survey previously since the houses sampled remain in the survey. The sample includes households from 878 counties in all of the states and the District of Columbia. In order to generalize the data, each unit represents more than 2000 housing units (U.S. Census Bureau, 2002a).

Sample

From the analysis, two separate samples were obtained from the 2001 American Housing Survey data. First, only those households which resided in and owned the manufactured or site-built homes that were one-unit buildings detached from all other buildings were selected. Second, households were required to own the land on which their home was located so that the price of the land did not inflate the purchase price of the homes. This eliminated approximately one-half of the manufactured homes because the manufactured homeowners rented the land their homes were placed on.

The households remaining in the sample were also required to own a home which has only one-story and no basement. The lot size was also limited to ten acres, again to eliminate the value of the land overemphasizing the price. The remaining households

were then retained in the sample only if there were no missing data. After eliminating all of the households that were not applicable to the study, there were 6677 site-built homes and 692 manufactured homes for a total sample size of 7369 households.

Table 1 is a listing of the variables included in this study. The definitions come directly from the Codebook for the American Housing Survey, Public Use File: 1997 and later (2002). The price of the home serves as the dependent variable. The independent variables were organized into structural, locational, and neighborhood characteristics are also given in Table 1.

Table 1

Variable Names, Definitions, and Type

Variable	Definition	Type
<u>Dependent Variable</u>		
LPRICE	Purchase Price of Home	Continuous
<u>Descriptive Variables</u>		
EDUC	Educational level of householder	Categorical
AGEGP	Age group of householder	Categorical
INCGP	Income group of householder	Categorical
MINORITY	Minority status of householder	Dummy
HHSEX	Sex of householder	Dummy
HHMAR	Marital Status of householder	Categorical
LIFECYCLE	Stage of the life cycle of householder	Categorical
<u>Structural Variables</u>		
BUILT	Year unit was built	Numerical
AMTE	Average monthly cost of electricity	Numerical
HALFB	Number of half bathrooms in unit	Numerical
BATHS	Number of full bathrooms in unit	Numerical
BEDRMS	Number of bedrooms in unit	Numerical
ROOMS	Number of rooms in unit	Numerical
UNITSF	Square footage of unit	Numerical

Table 1 (continued)

Variable	Definition	Type
AIRSYS	Central air conditioner in unit	Dummy
GARAGE	Garage or carport included with unit	Dummy
<u>Locational Variables</u>		
WFPROP	Unit is waterfront property	Dummy
ECOM1	Businesses/Institutions within ½ mile	Dummy
MSA	Metropolitan Statistical Area	Dummy
DISTJ	Number of miles traveled to work	Continuous
<u>Neighborhood Variables</u>		
COMMRECR	Community recreational facilities available	Dummy
COMMSERV	Community services provided	Dummy
CRIMEA	Neighborhood has neighborhood crime	Dummy
SATPOL	Neighborhood policed protection satisfactory	Dummy
NOISE	Noise in neighborhood is bothersome	Dummy

U.S. Department of Housing and Urban Development. (December 2002). *Codebook for the American Housing Survey, Public Use File: 1997 and later*. Washington DC: US Government Printing Office.

Hedonic Price Hypothesis

Rosen's hedonic price hypothesis is founded on the idea that housing is made up of characteristics and consumers allot a specific portion of the total price to certain characteristics. The hedonic price is used to determine the prices that consumers pay for these characteristics. The price paid by consumers is determined by regressing the characteristics of the houses on the price of the houses (Mason & Quigley, 1996). The large number of housing, neighborhood, and demographic variables that are included are beneficial because they potentially increase the adjusted R^2 (Ohsfeldt, 1988). From the

regression of the characteristics, the results will reveal the characteristic prices and can be compared across income, race, region, and education.

Using Statistical Analysis System (SAS), multiple regression models were formulated using the purchase price of the home as reported by the respondent as the dependent variable. One model included the various housing characteristics, using only site-built homes as the sample. A second model duplicated the regression model using manufactured homes as the sample. The coefficients indicated the portion of the purchase price associated with each characteristic. Any differences in the coefficients indicates different preferences based on the type of home.

Limitations

Since the sample is not random, there is a threat to external validity. Because of this, one must be careful when generalizing the study to the entire population. The lack of random sampling also introduces a selection bias. Those that self-select into the sample reduce internal validity in that they may contain a hidden variable that is the cause of their behaviors. The survey leaves room for variables to be left out of the study as well by not randomly selecting the participants (U.S. Department of Housing and Urban Development [HUD], 1998b).

The data were collected using telephone surveys which could lead to errors in reporting. The households interviewed may not accurately report the information asked for in the survey (U.S. Census Bureau, 2002a). In 1997 the AHS survey changed from personal interviews to computer assisted telephone interviews (CATI) due to budget constraints. Respondents may be less likely to interact with the computer systems and also may not be able to receive clarification on confusing questions. The interviewer

brings a personal bias and may not be able to obtain the necessary information to complete the surveys. Also, the questionnaire design, content and wording have been similar through the years but the survey is re-evaluated and changes are made when necessary. The survey is fairly consistent but the telephone interviews may make it more difficult to use and therefore require additional changes. Along with the measurement error comes the non-response error present when the interviewers are unable to locate the residents or the residents are unwilling to disclose certain information (U.S. Census Bureau, 2002a).

Also, the survey is limited due to error in self-reporting such variables as the value and purchase price of the home. The householders may not recall the exact amount paid at the time of purchase of their home and they may not be aware of the precise value of their home. The nature of the questionnaire also limits the ability to transfer the findings to other households (U.S. Department of Housing and Urban Development, 2002).

Data Analysis

Initially, the three categories of variables (structural, locational, and neighborhood), were tested using a one-way ANOVA analysis. Each individual variable was run in two models, one with only householders residing in manufactured homes and one with householders residing in site-built homes. After the one-way ANOVA analyses, the remaining variable set was tested for multicollinearity through a correlation matrix and the VIF statistics.

Finally the variables were analyzed using multiple regression. Two models were used, one containing households owning site-built homes and one containing households

owning manufactured homes. From the results of the analyses, the structural, locational, and neighborhood variables are examined to determine their affect on the purchase price of the homes. The hypotheses predict that the variables will have a positive effect on the purchase price of homes.

In summary, the 2001 American Housing Survey is the source of the data used in this study. Two regression models were run with only the purchase price of site-built homes as the dependent variable for one model and only the purchase price of manufactured homes as the dependent variable for the second model. The independent variables consisted of structural, neighborhood, and locational characteristics of housing and were the same for both models. According to the hedonic price hypotheses, the difference in the coefficients in the two models for a specific variable can estimate the difference in the effect the variable has on the price on the home. The next section reports the descriptive statistics and the results of the two regression analyses.

CHAPTER 4

RESULTS

This section presents the findings from the statistical analyses. First, a description of the sample that was obtained from the data will be provided and a series of descriptive statistics will be explained. Finally, the regression analyses of the manufactured and site-built homes will be discussed in relation to the structural, locational and neighborhood characteristics and the hypotheses presented earlier.

The data were obtained from the 2001 American Housing Survey. Only those households who reside in and own or are paying for the manufactured or site-built homes, which are one-unit buildings detached from all other buildings, were selected. Second, households were required to own the land on which their home was located so that the price of the land did not inflate the purchase price of the homes. The households remaining in the sample were also required to own a home which has only one-story and no basement. The lot size was limited to ten acres, again to eliminate the value of the land overemphasizing the price. The remaining households were then retained in the sample only if there were no missing data. After eliminating all of the households that were not applicable to the study, there were 6677 site-built homes and 692 manufactured homes for a total sample size of 7369 households.

The frequencies of the descriptive characteristics of the sample are shown in Table 2. The percentages of the total population and the percentages for both site-built and manufactured homes are given. Of those 7369 households, over 80% had at least a high school diploma or equivalent. Additionally, 39.1% of households were between the

ages of 45 and 64, more than any other age group (Table 2). Almost half (42.9%) of the sample earned an income greater than \$50,000 annually, and an overwhelming majority (84.8%) of the heads of households were white. Also, 63.3% of the households were headed by men and 62.6% of the household heads were married with a spouse present (Table 2).

Table 2

Descriptive Statistics of Householders

Characteristics	Owners of –					
	Site-Built Homes n=6677	%	Manufactured Homes n=692	%	Total n=7369	%
MSA						
Urban	5526	78.3	283	40.9	5509	74.8
Rural	1451	21.7	409	59.1	1860	25.2
Education of Householder						
8 th Grade or Less	468	7.0	59	8.5	527	7.2
High School or less, no diploma	776	11.6	156	22.5	932	12.7
High School Graduate or equivalent	1811	27.1	269	38.9	2080	28.2
Some College	1307	19.6	103	14.9	1410	19.1
Associate's or Bachelor's Degree	1737	26.0	96	13.9	1833	24.9
More than a Bachelor's Degree	578	8.7	9	1.3	587	8.0
Age of Householder						
Under 25 years-old	111	1.7	20	2.9	131	1.8
25-34 years-old	845	12.7	82	11.9	927	12.6
35-44 years-old	1479	22.2	136	19.7	1615	21.9
45-64 years-old	2596	38.9	282	40.8	2878	39.1
65 years-old or older	1646	24.7	172	24.9	1818	24.7

Table 2 (continued)

Characteristics	Owners of –					
	Site-Built Homes n=6677	%	Manufactured Homes n=692	%	Total n=7369	%
Household Income						
Less than \$10,000	504	7.6	95	13.7	599	8.1
\$10,000-\$20,000	810	12.1	150	21.7	960	13.0
\$20,001-\$30,000	868	13.0	142	20.5	1010	13.7
\$30,001-\$40,000	805	12.1	76	11.0	881	12.0
\$40,001-\$50,000	673	10.1	83	12.0	756	10.3
\$50,001 and higher	3017	45.2	146	21.1	3163	42.9
Racial Status of Householder						
White	5630	84.3	620	89.6	6250	84.8
Not White	1047	15.7	72	10.4	1119	15.2
Gender of Householder						
Male	4242	63.5	422	61.0	4664	63.3
Female	2435	36.5	270	39.0	2705	36.7
Marital Status of Householder						
Married, spouse present	4195	62.8	416	60.1	4611	62.6
Married, spouse absent	87	1.3	12	1.7	99	1.3
Widowed	837	12.5	90	13.0	927	12.6
Divorced	936	14.0	119	17.2	1055	14.3
Separated	86	1.3	13	1.9	99	1.3
Never Married	536	8.0	42	6.1	578	7.8
Stage in the Lifecycle						
No Children	4213	63.1	464	67.1	4677	63.5
Child Under 6 Years-old	492	7.4	41	5.9	533	7.2
Child Between 6 and 17 Years-old	1482	22.2	142	20.5	1624	22.0
Child Under 6 and Under 17 Years-old	490	7.3	45	6.5	535	7.3
Rating of the Unit as a Place to Live (10 the best)						
1-5	531	8.4	92	13.3	623	8.5
6-10	6146	91.6	573	86.7	6746	90.5

Table 2 (continued)

Characteristics	Owners of –					
	Site-Built Homes n=6677	%	Manufactured Homes n=692	%	Total n=7369	%
Rating of the Neighborhood as a Place to Live (10 the best)						
1-5	796	11.9	86	12.4	882	12.0
6-10	6051	88.1	606	87.6	6487	88.0

The households were asked to rate their homes and neighborhoods as a place to live on a 10 point Likert scale with 10 being the best. The categories were collapsed for ease of reporting, with 5 or less representing a negative rating and 6 or higher representing a positive rating. When asked how the households rate their homes as a place to live, 91.6% of those sampled gave their units a 6 or better (Table 2). Similar results were found when asked about the household's neighborhood as a place to live with 88.1% rating their neighborhood as a 6 or higher (Table 2). In addition, 63.5% of the households sampled had no children living in their home (Table 2).

Site-Built Homes

The sample contained 6677 households residing in site-built homes. Of these 6677 households, 5226 (78.3%) were located in urban areas with the remaining 1451 (21.7%) in rural areas. The majority (81.4%) of the households in site-built homes had obtained a high school diploma or the equivalent or higher level of education and 85.7% were aged 35 or older (Table 2). Almost half (45.2%) of the households who owned site-built homes earned an income of over \$50,000 followed by 13% earning between \$20,001 and \$30,000. Only 15.7% of the households were headed by an individual of minority status and 63.5% were headed by men (Table 2).

The households owning site-built homes were primarily headed by married householders with spouses present (62.8%) compared with 12.5% widowed householders and 14% headed by divorced householders (Table 2). Only eight percent of the households rated their homes as a place to live with less than a 6 on a 10 point rating scale (with 10 being the best), and only 11.9% rated their neighborhood as a place to live with less than a 6 on a 10 point rating scale (with 10 being the best) (Table 2). Most of the households (63.1%) either did not have children living at home or had no children. Only 7.4% of the households had a child that was between the ages of 6 and 17 and a child under the age of 6, and 22.2% only had children between the ages of 6 and 17 and 7.3% had children only under the age of 6 (Table 2).

Manufactured Homes

The sample of households owning manufactured homes consisted of 692 households. Of those households, over half (59.1%) were located in rural areas in contrast to the site-built homes which had only 21.7% households located in rural areas (Table 2). Most of the heads of households (68.9%) had at least a high school diploma or equivalent with 30.1% having at least some college. Of those households living in manufactured homes, 40.8% were between the ages of 45 and 64, and 24.9% were ages 65 and older (Table 2).

Only 21.1% of the households in manufactured homes earned an income higher than \$50,000, but 42.2% earned between \$10,001 and \$30,000. The householders of manufactured homes were primarily male (61%) and were white (89.6%) (Table 2). Over half (60.1%) of the householders were married with their spouses living in their homes followed by 17.2% divorced and 13% widowed (Table 2). Many (67.1%) of the

households did not have a child under the age of 17 and only 6.5% of the households had a child under 6 and a child between 6 and 17 years-old. Also, 5.9 % of the households had children under 6 and 20.5% had children between the age of 6 and 17 years-old (Table 2).

Householders owning manufactured homes also thought highly of their homes with 86.7% of them rating their homes a 6 or higher out of a 10 point scale (10 being the best) (Table 2). They also rated their neighborhoods highly as a place to live with 87.6% rating their neighborhood a 6 or higher out of a 10 point scale (10 being the best) (Table 2).

Comparison

In comparing manufactured and site-built homes, many more site-built homes (78.3%) were located in urban areas than manufactured homes (40.9%). Also, householders of site-built homes had obtained higher levels of education in that 26% of site-built residents had a bachelor's degree compared to only 13.9% of manufactured residents (Table 2). The income of those in site-built homes was higher with 45.2% earning over \$50,001 compared to only 21.1% earning over \$50,001 in manufactured homes. The age, race, gender, marital status and stage in the life cycle of the householder were similar regardless of the type of housing (Table 2).

Regression Analyses

Four different dependent variables were used in this study to find the best model with the most variation of the independent variables explained. The variables were the self-reported purchase price of the home (LPRICE), the natural log of the self-reported purchase price (lnLPRICE), the self-reported value of the home (VALUE), and the

natural log of the self-reported value (lnVALUE). After examining the results of each of the regressions, it was determined that using LPRICE, or the self-reported purchase price of the home, resulted in the best model because this model had a higher R-square and higher F-values than the three other models which means that the variables explained a greater amount of the variance.

The natural log of the value of the homes had the second best outcome but was dismissed due to the consideration that the value of the homes could be very different from the initial purchase price due to appreciation. From this analysis, the dependent variable for this study was the purchase price of the home coded as LPRICE in the American Housing Survey (Table 1).

After conducting the one-way ANOVA analysis with each independent variable, the variable SCH, which measures whether the public elementary school is satisfactory, was eliminated. It did not prove significant in the analysis with site-built homes or manufactured homes. The remaining variables were kept because statistically they were significant in one of the models meaning that the variable statistically had an effect on price. After the one-way ANOVA analyses were completed, three categories of variables were chosen consisting of a total of 18 variables. The eighteen variables were included in the two regression analyses, one with the self-reported purchase price of site-built homes and one with the self-reported purchase price of manufactured homes. The following is a description of the results from the analyses. Table 3 provides the summary statistics for the regression analyses.

The three categories containing eighteen variables chosen to be used in the regression analysis were as follows: Structural variables (year unit was built (BUILT),

average monthly cost of electricity (AMTE), (number of half bathrooms in unit (HALFB), number of full bathrooms in unit (BATHS), number of rooms in unit (ROOMS), number of bedrooms in unit (BEDRMS), square footage of unit (UNITSF), central air conditioning (AIRSYS), and a garage or carport is included (GARAGE)), locational variables (distance traveled to work (DISTJ1), area is near a business district (ECOM1), waterfront property (WFPROP), and metropolitan statistical area (MSA)), and neighborhood variables, (community recreation facilities available (COMMRECR), noise in neighborhood is bothersome (NOISE), satisfaction with police (SATPOL), community service in area (COMMSERV), and crime in neighborhood is bothersome (CRIMEA)).

Table 3

Regression Analysis Results

Site-built Homes			
Variable	Parameter Estimate (β)	Standard Error	P-value
Intercept	-1221056.00	95020.00	.0001
<u>Structural Variables</u>			
BUILT	597.29	48.98	.0001
AMTE	-23.39	15.77	.1380
HALFB	19058.00	2217.63	.0001
BATHS	40756.00	1946.84	.0001
BEDRMS	-1378.33	1681.42	.4124
ROOMS	3830.90	783.88	.0001
UNITSF	9.86	1.02	.0001
AIRSYS	-18774.00	2081.90	.0001
GARAGE	19272.00	2255.90	.0001
<u>Locational Variables</u>			
DISTJ1	25.97	6.53	.0001
ECOM1	1068.26	2418.46	.6587
WFPROP	30001.00	5563.77	.0001

Table 3 (continued)

Variable	Parameter Estimate (β)	Standard Error	P-value
<u>Neighborhood Variables</u>			
COMMRECR	9987.94	3170.79	.0001
NOISE	4027.30	2546.40	.1138
SATPOL	5163.30	2996.49	.0849
COMMSERV	-8667.68	2620.02	.0009
CRIMEA	-10379.00	2577.30	.0001
N=6677 R2=.2649 P-value=.0001 F-value=133.27			
Manufactured Homes			
Variable	Parameter Estimate (β)	Standard Error	P-value
Intercept	-914367.00	157038.00	.0001
<u>Structural Variables</u>			
BUILT	459.95	80.07	.0001
AMTE	12.86	19.53	.5105
HALFB	-362.67	3055.39	.9055
BATHS	10006.00	2517.99	.0001
BEDRMS	-352.85	2014.60	.8610
ROOMS	2659.53	1027.48	.0099
UNITSF	5.10	1.57	.0012
AIRSYS	-5648.63	2167.89	.0094
GARAGE	6711.76	2084.95	.0013
<u>Locational Variables</u>			
DISTJ1	15.75	11.34	.1653
ECOM1	-980.33	3241.48	.7624
WFPROP	5345.39	5967.11	.3707
MSA	6641.28	2018.40	.0011
<u>Neighborhood Variables</u>			
COMMRECR	5871.16	2472.23	.0178
NOISE	-2448.55	3028.98	.4192
SATPOL	-6169.28	2623.67	.0190
COMMSERV	-4744.60	3021.98	.1169
CRIMEA	544.24	3120.85	.8616
N=692 R2=.2649 P-value=.0001 F-value=133.27			

In addition to the one-way ANOVA analysis, the variables were tested for multicollinearity. The variance inflation factor (VIF) was calculated to test for multicollinearity and none of the variables showed a problem with correlation. Additionally, a correlation matrix was developed and all variables did not suffer from high correlation. T-tests were also run to determine the differences in the means between the variables for site-built and manufactured homes. Table 4 shows the results of the T-tests.

Table 4

Group Means for Numerical Variables

Variables	Site-built Homes		Owners of-- Manufactured Homes		F Value
	Mean	S.D.	<u>Mean</u>	S.D.	
LPRICE	84530.00	80722.00	30958.00	28084.00	8.26*
BUILT	1965.40	20.22	1980.10	13.86	2.13*
UNITSF	1646.10	913.60	1291.10	681.16	1.80*
ROOMS	5.96	1.41	5.31	1.25	1.27*
BEDRMS	2.96	.66	2.69	.68	1.05
BATHS	1.62	0.60	1.63	.52	1.34
HALFB	.21	.42	.14	.36	1.42*
AMTE	86.21	57.40	82.46	52.41	1.20*
DISTJ1	26.30	130.21	17.85	85.34	2.33*

* $p < .01$

Site-Built Homes

This section is designed to explain the results of the regression analysis using only those households that own site-built homes. The structural, locational, and neighborhood variables listed previously were included in the analysis resulting in a model which was significant with a p -value=.0001, an R-square value of .2649, and an F-value of 133.27.

Using an $\alpha=.10$ in the regression analysis with site-built homes, the categories of variables were analyzed.

The first three hypotheses were tested with the using the sample of site-built homes. The hypotheses are:

- H₁: Structural characteristics (the more recent the year the unit was built, lower average monthly cost of electricity, number of full bathrooms in unit, number of rooms in unit, square footage of unit, presence of central air conditioning, and garage or carport included with unit) will have a positive effect upon the price of site-built homes.
- H₂: Locational characteristics (waterfront property, business institutions within one-half block, metropolitan statistical area, and number of miles traveled to work) will have a positive effect upon the price of site-built homes.
- H₃: Neighborhood characteristics (community recreational facilities available, community services provided, lack of neighborhood crime, satisfaction with police protection, and neighborhood noise not bothersome) will have a positive effect upon the price of site-built homes.

In analyzing the structural characteristics in the site-built model, the amount paid for electricity (AMTE) and the number of bedrooms in the unit (BEDRMS) were found to be insignificant predictors of the purchase price of the homes with p-values of .1380 and .4124 respectively. Therefore, Hypothesis 1 was rejected as a whole. However, seven of the nine structural variables were found to be significant predictors of the purchase price of site-built homes. The year the unit was built (BUILT) ($\beta=597.29$), the number of half bathrooms in the unit (HALFB) ($\beta=19058.00$), the number of full

bathrooms in the unit (BATHS) ($\beta=40756.00$), the number of rooms in the unit (ROOMS) ($\beta=3830.90$), the square footage of the unit (UNITSF) ($\beta=9.86$), and the presence of a garage or carport (GARAGE) ($\beta=19272.00$) all had a positive effect on the purchase price of site-built homes. The presence of a central air conditioning system (AIRSYS) ($\beta=-18774.00$) had a negative effect on the purchase price of site-built homes, which was opposite of what the hypothesis predicted.

In examining the locational characteristics in the site-built model, having businesses and institutions within one-half block was found to be an insignificant predictor of the purchase price of the homes with a p-value of .6587. Therefore, Hypothesis 2 was rejected as a whole. However, the other three locational variables were found to be significant predictors of the purchase price of site-built homes with positive effects. The distance traveled to work (DISTJ1) ($\beta=25.97$), waterfront property (WFPROP) ($\beta=30001.00$) and Metropolitan Statistical Area (MSA) ($\beta=341873.00$) were the significant locational variables.

Hypothesis 3 focused on neighborhood characteristics. Problems with neighborhood noise (NOISE) was found to be insignificant with a p-value of .1138. Because of the insignificance of the NOISE variable, the hypothesis as a whole was rejected. The remaining variables all had a significant effect on the purchase price of site-built homes. The neighborhood variables that had a positive effect on the purchase price of site-built homes were the availability of community recreational facilities (COMMRECR) ($\beta=9987.94$) and satisfaction with neighborhood police protection (SATPOL) ($\beta=5163.30$). The availability of community services (COMMSERV) ($\beta=-8667.68$) had a negative effect on the purchase price of site-built homes. A perceived

problem with neighborhood crime (CRIMEA) ($\beta = -10379.00$) had a negative effect on the purchase price of site-built homes as predicted by Hypothesis 3.

The structural characteristics of site-built homes appear to be the most important to consumers because the results of the regression analysis shows the strongest effect from the structural variables. This is probably due to the uniformity of many homes in regards to structural characteristics whereas neighborhood and locational characteristics possibly differ greatly from home to home.

Manufactured Homes

The same regression analysis was run using manufactured homes as the sample. The model proved significant with a $p\text{-value} = .0001$. The R-square was .2337, explaining 23% of the variance in price, was similar to the R-square associated with the model using site-built homes as the sample. The F-value was much lower for this model at 11.40. Using an $\alpha = .10$ in the regression analysis with manufactured homes, fewer variables were found to be significant predictors of the purchase price.

The hypotheses associated with manufactured homes are as follows:

- H₄: Structural characteristics (the more recent the year the unit was built, lower average monthly cost of electricity, number of full bathrooms in unit, number of rooms in unit, square footage of unit, presence of central air conditioning, and garage or carport included with unit) will have a positive effect upon the price of manufactured homes.
- H₅: Locational characteristics (waterfront property, business institutions within one-half block, metropolitan statistical area, and number of miles traveled to work) will have a positive effect upon the price of manufactured homes.

H₆: Neighborhood characteristics (community recreational facilities available, community services provided, lack of neighborhood crime, satisfaction with police protection, and neighborhood noise not bothersome) will have a positive effect upon the price of manufactured homes.

The structural characteristics of a manufactured home are addressed by

Hypothesis 4. Three of the nine variables were insignificant predictors of the purchase price of manufactured homes. Amount paid for electricity (AMTE), number of half bathrooms in the unit (HALFB), and the number of bedrooms in the unit (BEDRMS) were the insignificant structural variables with p-values of .5105, .9055 and .8610 respectively. Due to these insignificant variables, Hypothesis 4 was rejected as a whole. However, the year the unit was built (BUILT) ($\beta=459.95$), the number of full bathrooms in the unit (BATHS) ($\beta=10006.00$), the number of rooms in the unit (ROOMS) ($\beta=2659.53$), the square footage of the unit (UNITSF) ($\beta=5.10$), and the presence of a garage or carport (GARAGE) ($\beta=6711.76$) all had a positive effect on the purchase price of site-built homes. The presence of a central air conditioning system (AIRSYS) ($\beta=-5648.63$) had a negative effect on the purchase price of site-built homes which was not predicted by the hypothesis.

Many of the locational variables were insignificant in the model using manufactured homes. The distance traveled to work (DISTJ1) (pvalue=.1653), having businesses and institutions within one-half block (ECOM1) (p-value=.7624) and waterfront property (WFPROP) (p-value=.3707) were insignificant predictors of the purchase price of manufactured homes. Only metropolitan statistical area had a significant, positive effect on the purchase price of manufactured homes ($\beta=6641.28$).

Because of the insignificance of the variables, the variables cannot support Hypothesis 5, therefore we reject the hypothesis.

The neighborhood variables also suffered from large number of variables lacking significance. A problem with neighborhood noise (NOISE) (p-value=.4192), the availability of community services (COMMSERV) (p-value=.1169) and a perceived problem with neighborhood crime (CRIMEA) (p-value=.8616) were not significant predictors of the purchase price of manufactured homes. Therefore, Hypothesis 6 is rejected due to the inability to determine the effect the insignificant variables have on the dependent variable. The availability of community recreational facilities (COMMRECR) ($\beta=5871.16$) and satisfaction with neighborhood police protection (SATPOL) ($\beta=-6169.28$) were significant with the availability of community recreational facilities having a positive effect on price. Satisfaction with neighborhood police protection had a negative effect on price.

Comparison

While the model using only manufactured homes had fewer significant variables, there are still some similarities between the site-built and manufactured model. The structural variables have many of the same results. Both models suffer from amount paid for electricity (AMTE) and the number of bedrooms in the unit (BEDRMS) lacking significance however the manufactured model also has the number of half bathrooms in the unit (HALFB) as an insignificant variable. The remaining significant variables all had the same results in regards to the direction of the effect but the site-built homes had higher coefficients possibly because of the higher purchase price of the homes.

It is difficult to compare the remaining groups of variables. Many of the locational and neighborhood characteristics were insignificant in the manufactured model and therefore cannot be compared to their counterparts in the site-built model. However, the metropolitan statistical area (MSA), the only locational variable significant in both models, had a positive effect in both models. Also, in comparing the neighborhood characteristics, the availability of community recreational facilities (COMMRECR) had positive effects on price in both models. An interesting finding is that, while significant in both models, satisfaction with police protection (SATPOL) had opposite effect on price. The variable had a positive effect on the purchase price of site-built homes and a negative effect on the price of manufactured homes. This could be due to the fact that over half (59.1%) of manufactured homes are located in rural areas where police protection is not available.

The structural characteristics appear to have the same effect on the price of the different types of homes and therefore can be considered the most valuable characteristics when studying the variability in the purchase price of homes. The results indicate a need for further research in determining the effects of locational and neighborhood characteristics that significantly contribute to the price of a home. Although some locational and neighborhood characteristics were found to be significant in the models, the data did not reveal convincing results as to which characteristics are most important.

CHAPTER 5

SUMMARY AND CONCLUSIONS

The purpose of this paper is to compare the prices home buyers pay for structural, locational and neighborhood characteristics of manufactured homes compared to site-built homes. Manufactured homes are becoming increasingly popular and their overall impact has yet to be seen. Differences in consumer behavior toward manufactured homes versus site-built homes affect many areas. All levels of government can use the information in making policy decisions about housing in America. Zoning, affordability, marketing, housing assessment and housing quality are all issues associated with manufactured housing.

An analysis of the characteristics of a house was conducted through the literature review to determine which characteristics should be tested in the analysis. The literature provided various combinations of the variables, each study focusing on the individual variables of interest. Butler (1982) concluded that all variables affecting the price of the home should be included in the analysis but concedes that this is not feasible due to data constraints. Many of the studies (Blackley & Ondrich, 1988; Cheshire & Sheppard, 1995; Jagun & Brown, 1990; Janssen & Soderberg, 1999; Li & Brown, 1980; Linsley, 1990; MacDonald & Veeman, 1996; Mason & Quigley, 1996; and Newsome & Zietz, 1992, Rutherford & Thomson, 1999) included different categories of variables to determine their affect on price. However, no study has been done comparing manufactured and site-built homes.

The literature revealed three sets of variables that were appropriate for the analysis. The variables were either structural, locational, or neighborhood characteristics. Many of the studies reviewed used numerous variables of different types to study housing. The structural variables used in this study included: year the unit was built, average monthly cost of electricity, number of half bathrooms in the unit, number of full bathrooms in the unit, number of bedrooms in the unit, number of rooms in the unit, square footage of the unit, central air conditioner in the unit, and garage or carport included with the unit. The locational variables used in this study included: unit is waterfront property, business/institutions within ½ block, metropolitan statistical area, and number of miles traveled to work. Finally, the neighborhood variables included in this study were: community recreational facilities available, community services provided, neighborhood has neighborhood crime, neighborhood police protection satisfactory, and noise in neighborhood is perceived as bothersome.

The theoretical framework for this study was Rosen's (1974) hedonic price hypothesis which says that through regression analysis the portion of price accounted for by each characteristic of a good can be determined (Rosen, 1974). The hypothesis, which is derived from Lancaster's (1966) theory that goods are comprised of characteristics and consumers purchase a good that embodies the bundle of characteristics that are most desired. Just as other goods, housing is made up of various characteristics, and each characteristic is valued differently by consumers based on individual tastes and preferences (Lancaster, 1966).

This study used the 2001 American Housing Survey data. Information is available on structure, neighborhoods, and demographics. These are all important areas

as they all affect the overall price paid for housing. Two samples were created consisting of site-built and manufactured homes separately each containing homeowners who own the land their homes are placed on with lot sizes less than ten acres and whose homes were single story with no basement. According to the hedonic hypothesis, numerous variables should be used in the analysis, therefore, the eighteen variables were selected through a comprehensive literature review. Regression analysis was used to determine the hedonic prices of the characteristics.

The hypotheses for this study were:

- H₁: Structural characteristics (the more recent the year the unit was built, lower average monthly cost of electricity, number of full bathrooms in unit, number of rooms in unit, square footage of unit, presence of central air conditioning, and garage or carport included with unit) will have a positive effect upon the price of site-built homes.
- H₂: Locational characteristics (waterfront property, business institutions within one-half block, metropolitan statistical area, and number of miles traveled to work) will have a positive effect upon the price of site-built homes.
- H₃: Neighborhood characteristics (community recreational facilities available, community services provided, lack of neighborhood crime, satisfaction with police protection, and neighborhood noise not bothersome) will have a positive effect upon the price of site-built homes.
- H₄: Structural characteristics (the more recent the year the unit was built, lower average monthly cost of electricity, number of full bathrooms in unit, number of rooms in unit, square footage of unit, presence of central air conditioning, and

garage or carport included with unit) will have a positive effect upon the price of manufactured homes.

H₅: Locational characteristics (waterfront property, business institutions within one-half block, metropolitan statistical area, and number of miles traveled to work) will have a positive effect upon the price of manufactured homes.

H₆: Neighborhood characteristics (community recreational facilities available, community services provided, lack of neighborhood crime, satisfaction with police protection, and neighborhood noise not bothersome) will have a positive effect upon the price of manufactured homes.

The hypotheses were not fully accepted for this study due to the lack of significance of variables. Of the variables that were significant, the negative effect of satisfaction with police protection variable in the manufactured model was not predicted by Hypothesis 6. Also, the presence of a central air conditioning unit had a negative effect on the purchase price in both the site-built and manufactured model which did not support Hypothesis 1 and Hypothesis 4. The remaining significant variables all had the predicted effect on the purchase price of homes.

The hypotheses were not fully accepted for this study. Table 5 is a summary of the results of the regression analyses. Nine individual variables had a significant effect in both models. An interesting finding of the study is that of the nine variables that proved to be significant, only satisfaction with neighborhood police protection had opposite effects on the price of the homes. The similarity in the results of the significant variables indicates that the variables are important predictors of price regardless of the type of home.

Table 5

Summary of Findings

	Effect on Purchase Price-	
	Site-Built Findings	Manufactured Findings
<u>Structural Variables</u>		
Year unit was built (BUILT)	+	+
Average monthly cost of electricity (AMTE)	-	+
Number of full bathrooms in unit (BATHS)	+	+
Number of bedrooms in unit (BEDRMS)	-	-
Number of rooms in unit (ROOMS)	+	+
Square footage of unit (UNITSF)	+	+
Central air conditioner in unit (AIRSYS)	-	-
Garage or carport included with unit (GARAGE)	+	+
<u>Locational Variables</u>		
Unit if a waterfront property (WFPROP)	+	+
Business/institutions within ½ block (ECOM1)	+	-
Metropolitan statistical area (MSA)	+	+
Number of miles traveled to work (DISTJ1)	+	+
<u>Neighborhood Variables</u>		
Community recreational facilities available (COMMRECR)	+	+
Community services provided (COMMSERV)	-	-
Neighborhood had neighborhood crime (CRIMEA)	-	+
Neighborhood police protection satisfactory (SATPOL)	+	-
Noise in neighborhood is bothersome (NOISE)	+	-

+ = positive effect

- = negative effect

*p<.01

The findings indicate that structural variables are more reliable than locational or neighborhood variables in predicting the purchase price of homes. Based on the fact that so many of the variables had the same effect regardless of which model they were in leads to the conclusion that consumers are looking for similar bundles of characteristics in homes and manufactured homeowners view their homes as the same as a site-built home.

The research indicated that bedrooms were significant in many prior models. Also, energy efficiency was found to be important in prior studies. Manufactured housing offers energy efficiency as one of its key selling points. Consumers need to become more aware of the benefits associated with energy savings. Also, half bathrooms were revealed to be important in the literature as an asset to manufactured homes. Waterfront units were also found to be desirable in previous research but were not significant in this study. The findings of this study indicate the need to do further research on what consumers are looking for in housing. Consumers need to be educated as to what amenities are available in housing, both site-built and manufactured.

In relation to Rosen's hedonic hypothesis, the variables with the strongest significant coefficients had the strongest effect on the purchase prices of the homes. Therefore, the results indicate that the higher coefficients of the structural characteristics imply that structural characteristics are more influential on the purchase price of homes. Neighborhood and locational characteristics have less influence on the purchase prices of homes because of their lower coefficients.

Implications

This study reveals that consumers are looking for specific attributes in site-built homes and less factors influence the price of manufactured homes. This can possibly be explained by the uniformity often present in manufactured home design compared with the diversity found in site-built homes. Manufacturers should consider this when designing new models of manufactured homes. However, the results show that consumers want the same structural characteristics in housing and purchasers of manufactured homes do not see their homes as different from site-built homes. The fact that manufactured homes are purchased less than site-built homes could actually be associated with the lack of information about manufactured homes. If consumers were aware of the lack of differences between manufactured and site-built homes, they may be more likely to purchase manufactured homes.

Additionally, the results of this study can be used by communities to change local policy and zoning laws. The industry can alter marketing strategies to promote the characteristics valued by manufactured home buyers in a more effective manner. Also, this study will contribute to the growing volume of literature on manufactured housing as an affordable housing option. With more information available on manufactured housing, it is important that researchers understand the changes in the trends and make appropriate recommendations to industry, consumers, and government. Housing educators can use the information to educate consumers and the industry about manufactured homes as a housing alternative. This study is an effort to help consumers reach the goal of home ownership. Manufactured housing could be one of the affordable housing options that America needs.

Manufactured housing shipments fell 4% from the first to the second quarter of 2003 (U.S. Department of Housing and Urban Development [HUD], 2003). In comparison, housing sales overall rose 16.8% over the same period of time (U. S. Census Bureau, 2003b). The shipment numbers are down 22% from the second quarter of 2002 meaning that shipments are lower than they have been in the past forty years (U.S. Department of Housing and Urban Development [HUD], 2003). With sales dropping, manufacturers need to know what potential buyers are looking for in their manufactured home.

The 2003 president of the Manufactured Housing Institute, Chris Stinebert (2003), stated that "...the primary mission for the manufactured housing industry must be to focus on those activities that would improve the home-buying experience, develop consumer confidence in our homes, and create value for the buyers of manufactured housing" (p. 20). This study is an effort to assist in creating value for the buyers by alerting manufacturers to what characteristics are important to the buyer. The industry as a whole needs to serve its consumers and educate them as to the benefits of manufactured housing.

Future Studies

Researchers in the future should consider using additional variables in the models to increase the knowledge of the variance in price. Although this study revealed interesting information about the consumer and housing purchases, there is still much of the subject to be studied through academic research.

In conclusion, this study examined the purchase price of both manufactured and site-built homes. The research done can be put to use in determining the needs of home

buyers and working to better meet those needs. Research on manufactured housing is needed because of the shortage of affordable housing. The lower purchase price of manufactured housing makes it a viable option in lessening the problem across the country. This paper is an effort to increase its acceptance. The findings reveal that consumers value various characteristics regardless of housing type. Therefore, research should be focused on determining the specific characteristics consumers find important.

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