A GEOGRAPHICAL ANALYSIS OF HOUSING COST

VARIATION IN THE UNITED STATES,

1982-1989

By

KENT S. SCHREINER

Bachelor of Science

Northwest Missouri State University
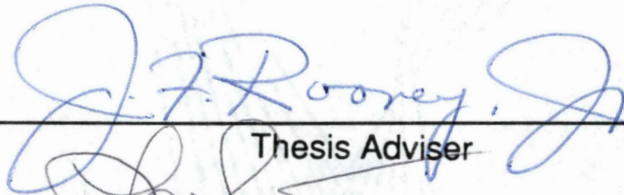
Maryville, Missouri

1988

Submitted to the Faculty of the
Graduate College of the
Oklahoma State University
in partial fulfillment of
the requirements for
the Degree of
MASTER OF SCIENCE
July, 1990

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Thesis Approved:

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Thesis Adviser

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Dean of the Graduate College

ACKNOWLEDGEMENTS

During my stay at OSU I have had many memorable experiences both inside, and especially outside of the classroom. For all of the people that have helped and encouraged me during this time, I would like to say thank you. I have appreciated all of your support.

My primary thanks must go to my parents, Tom and Joyce Schreiner, who have been my best supporters throughout my life. They have always had confidence in me and provided love and encouragement when it was needed. To both of them and the rest of my family and friends, thanks for believing in me and supporting me during my years in college.

To the entire OSU Geography Department faculty and staff, a thank you must be given. I thank my thesis adviser, Dr. Rooney, and committee members, Dr. Seig and Dr. Curtis, who gave me guidance as I completed this thesis. Even though time for questions was hard to get, I appreciate all that I was given. I especially thank my committee for being inconvenienced during the rush to complete this thesis. Thanks also to Dr. Stadler, for helping me with PC SAS, to Dr. Tweedie, for helping me with statistical analysis and table preparation, and to Dr. Wikle, who helped me with numerous computer operations and SAS interpretation.

The last group to thank would be my fellow graduate students for being there for daily support. Thanks for the memorable experiences which we have shared. I have made many friendships that I hope will last for a long time. The best of luck to each of you!

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CHAPTER I

INTRODUCTION

Part of the 'American Dream' is to own your own home. This is a goal for most people as they plan for their futures. However, a prerequisite to owning a home is that the individual or family must be able to afford it. The purchase of a home will probably be the largest investment that most people will ever make. It requires a decision that needs to be made wisely.

Throughout the United States the cost of an essentially identical house varies widely. On the average, homes in states such as California and Connecticut tend to be more expensive than homes in Alabama or South Dakota. This variation in housing costs begs explanation. Why should it be so much more expensive to live in one place than in another?

The variability of housing values can be seen by examining 1980 Census of Housing Data (Figure 1). In 1980, the most expensive homes were found in the Western United States while the least expensive were concentrated in the South-Central area. A second, high value area was found along the Northeast Coast where many urban areas had large, expanding populations. The South-Central and Central areas constitute the most inexpensive places to live. These regions include agricultural areas with slowly expanding and declining populations which produced little demand

Legend:
- $31,100-$36,800
- $36,900-$41,400
- $41,500-$46,700
- $46,800-$59,600
- $59,600-$119,400

U.S. Mean: $47,300.
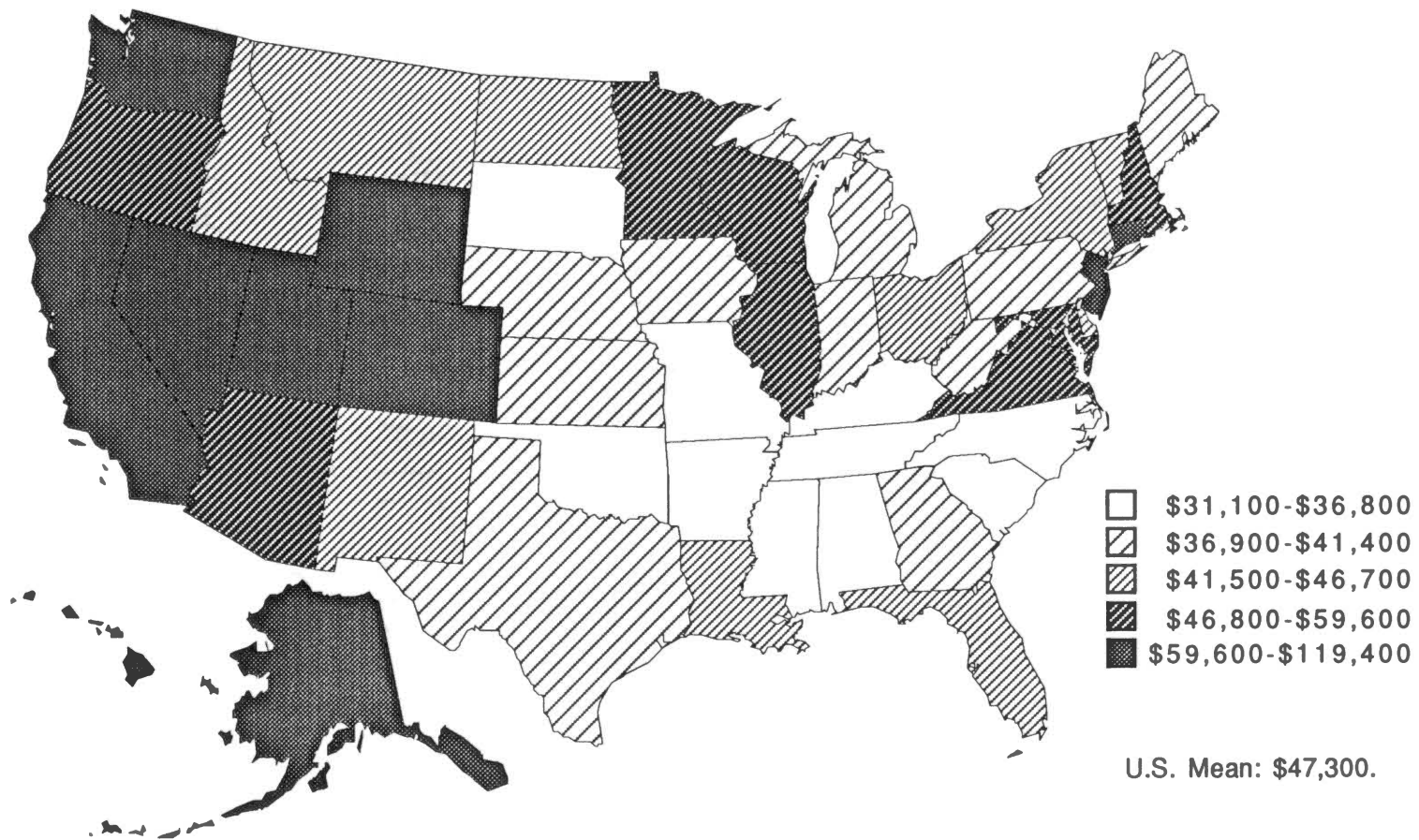
Data Source: 1980 U.S. Census of Housing.

Mapped by Quintiles.

Figure 1. Median Housing Values by State, 1980.

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for housing, thereby causing housing values and selling prices to be lower. The Census Bureau reported that the United States' average median home value was $47,300 in 1980. The highest value was in Hawaii at $119,400 while the lowest value was in Arkansas at $31,100. These data are only representative median housing values at one moment in time. A map of current median housing values would differ greatly from this one. Thus studying cost variation over time, as well as over space, would be vital.

The majority of housing cost variation studies have been done by economists. Cebula (1983) developed an empirical model to try to understand geographic living-cost differentials. However, he and others have often neglected the fact that this variability occurs over space.

This study will examine housing cost variations throughout the United States from a geographical perspective. The patterns of home price variability in cities throughout the country will be analyzed using statistical analysis. The goal is to develop a better understanding of the variables which are important in determining why housing costs vary from place to place.

<div align="center">Nature of the Housing Market</div>

Housing, or shelter, is a basic need of humankind. However, when most people purchase housing they are purchasing more than just the shelter aspect of the property. Consumers usually have several demands that must be met; if the proper house is supplied, at an affordable price, then a sale will often occur. The housing market is the setting within which consumers operate when

deciding which house will best meet their needs. This setting involves the socioeconomic environment of a geographic area. A hierarchy of housing markets exists from small, city submarkets to large, national housing markets. A particular city's housing market is most often the market that is of primary concern to consumers.

Regardless of the hierarchical level, housing markets are not stagnant; their economic structures are always changing. Market activity generally depends upon how local economies are behaving. If the economy, in terms of job creation, is active then the housing market usually tends to be active with an upward bias in price. On the other hand, stagnant economies tend to produce markets which often experience declines in local housing prices. Changing demographic structure is also of key importance in determining housing market activity. The sizes of households, the number of households, median age of communities, and a variety of other items are important in determining the quantities of different types of housing consumers demand. While the behavior of consumers and producers is rarely predictable in the long run, short term behavior is more easily comprehended. (Burns and Grebler, 1986).

Housing is an interesting commodity for analysis due to several reasons. First, when consumers purchase most goods they purchase them in one location and then take and consume them elsewhere. However, in the case of housing consumers generally relocate to the location of the good. This location aspect is why housing is important to study in the geographic context. Second, a house is a durable good; it will have a long period of use before it is

discarded unlike most nondurable goods. This time aspect is important in analyzing change. Third, individual houses are heterogeneous commodities, composed of a variety of different characteristics whose combination varies based upon demand. This variability will affect selling prices and home values. Lastly, housing is a very expensive commodity. People must invest a great deal of money when they purchase a home. This large investment makes it necessary to better understand housing market operation. The synthesis of all of these separate elements makes housing studies both complex and intriguing (Quigley, 1978).

Spatial Nature of Housing

The variability of housing characteristics over space makes housing an ideal topic for geographers to study. Perhaps the best summation of how geography is tied to housing was given by Bourne in his work The Geography of Housing. Bourne examined the structure of housing markets, the variability which existed in them, influences which produced this variability, and the effects which government policies had upon markets.

One reason why the geography of housing has been largely neglected is because of the lack of consumption studies in economic geography (Rooney and Hecock, 1971). Studies have most often focused upon production, studying where goods are produced. In studying housing costs the other side of economic geography is examined, the geography of consumption. This is a very important study area that has a great effect upon people's lives. In fact, consumption often determines what goods are to be produced

(Hecock and Rooney, 1968). As the consumption of any good varies from place to place, it will determine how much of a particular commodity will continue to be produced at these different locations. Economic geography needs to address both sides of the economic picture to gain a balanced understanding of why economic conditions differ.

As demand increases for new housing, local governments must decide whether or not to allow the supply of houses to increase. Next, decisions would be made as to what portions of cities this new development would be allowed to occur within. Urban planning plays a key role in determining the spatial structure of cities. With residential land taking up the most area within cities, housing plays an important role in a city's spatial structure.

Housing markets in most cities consist primarily of larger, older housing stocks. This is due to the long term durability of homes. Once a home is built it will be in place for a long period of time. Attributes which become associated with neighborhoods are also established for long time periods. Houses in different areas will tend to house similar socioeconomic groups of people throughout their existence. The price geography in cities, the level of economic well-being in certain neighborhoods, is often based upon the housing that exists in certain areas (Bourne, 1976).

Housing Affordability

The primary concern with the inflation of housing costs is that more people appear to be priced out of the housing market. Fewer people are able to afford a home purchase. Low income families

used to be the primary groups who could not afford housing. But with the price increases which have occurred since 1970, it has been hypothesized that fewer middle class families are now able to afford adequate housing (Bruce-Briggs, 1973). In fact, some families may now need to have two or more incomes in order to maintain adequate housing where only one income was previously needed (Palm, 1979). The needed money for a downpayment on a home or for monthly mortgage payments is often unavailable to a growing number of households.

The homes that many people presently live in would not be affordable to them if they were to purchase them today. But since they purchased them before rapid price escalation began, they made good investments. Thus people who have been in the housing market for longer periods of time have more opportunity than new entrants.

Demographic changes often produce changes in demand for housing. Changes in household structure, such as the effects of an increasing divorce rate and an expanding number of one-person households, have increased demand for more housing to be built. For example, over the past two decades the World War II baby boom generation has entered the national housing market. This increased demand has likely caused prices to rise as the available supply has decreased. Migration of people throughout the country has also had pronounced effects upon the economies in certain areas. The most pronounced migration has been from the Northeastern and Midwest areas of the United States to regions in the South and the West , the so-called "Sunbelt", where there had been expanding job markets (Alonso, 1983). It has been in these regions of high economic

growth where there has been some of the greatest appreciation in housing price levels.

The topic of housing affordability in the United States has received widespread attention during the past two decades. It has been during this period of time that prices have increased at some of their fastest rates. This in itself may not seem critical, except for the fact that median household incomes has not increased proportionally to median home costs over this same period of time (Figure 2).

Before 1970, median household incomes and new housing costs increased at proportional rates. By 1975, home costs began to escalate while incomes increased at a slower rate. The inflation of home costs has continued until the most recent data were collected. Over that time, average household incomes continued to slowly increase. New home costs increased from six hundred to one thousand percent between 1960 and 1988. In this same period of time, median household incomes only increased by about four hundred percent. New home costs overestimate median home values but their sharp rise show that there has been an increase in costs of both new and existing homes since 1970.

After 1975, data were available on new housing costs by the four census regions. The most dramatic price increases have occurred in the Northeast. Even though the price inflation in the West has probably received the most nationwide attention, it is the Northeast which appears to be the least affordable place to live. At the opposite extreme, the region that has continually had the
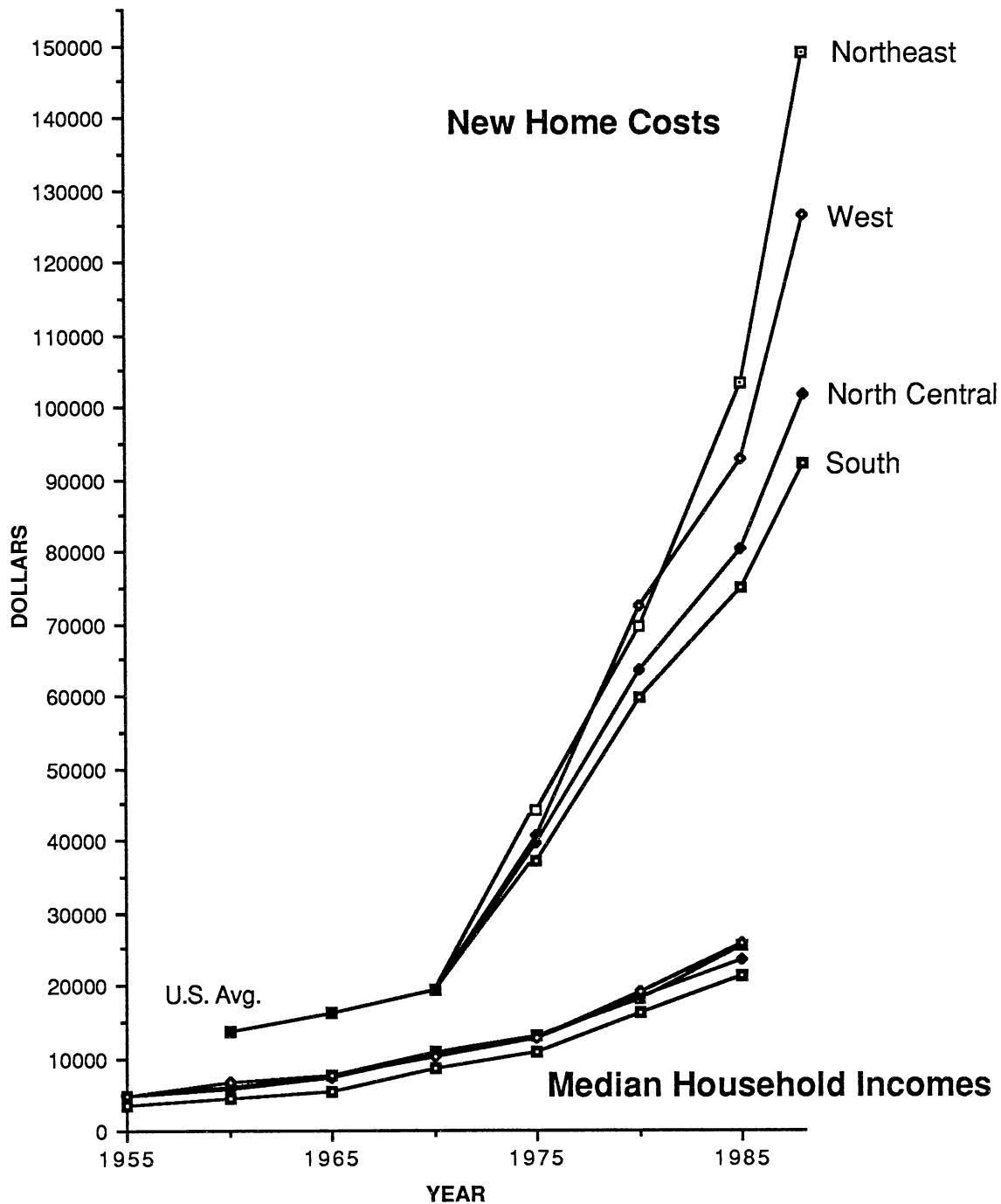
Figure 2. New Home Cost/Median Household Income
by Census Region, 1955-1988.

lowest prices for new homes has been the South, which seemingly made this region the most affordable.

Incomes throughout the United States have not varied much in the different census regions over time. Incomes have been the lowest in the South while the other regions have behaved equally as they have all steadily increased. These data would support that an affordability crisis is developing. Housing price values are increasing much too quickly in comparison to household income levels. Due to housing cost and household income variability throughout the country, some places have certainly become more affordable than others.

Brief History of the Housing Price Escalation in the United States

Home price variability is not a new situation in the United States. In this century, prices of homes have increased steadily. Rapid escalation of prices have occurred at various times, most notably the periods following the world wars. During periods of poor economic conditions, such as the world wars and the Great Depression, prices throughout the country have tended to level off and even decrease (Grebler and Mittelbach, 1979).

Grebler and Mittelbach (1979) traced the case of home price inflation to the mid-1970s, beginning in the urban markets in California. With increasing demand and not enough supply prices went up quickly. People saw rising prices as representing an opportunity for economic investment. People bought homes and sold them to others for greater prices in order to make profits.

Speculation soon spread to other large cities in the West and the South, producing more widespread price escalation. The boom in prices was in full swing throughout the country by the end of the decade.

The government, fearing the eventual consequences of this economic expansion, established a task force to study housing costs and to recommend a program to help reduce and stabilize them (United States' Department of Housing and Urban Development, 1978). The recommendations included a variety of legislative measures. After some time, and the passage of different pieces of legislation, home price escalation eventually began to slow down.

The government intervention that occurred in the 1970s was not new to the housing market. The United States' government has always been concerned with the living conditions of its citizens. Little federal legislation existed until the era of the Great Depression. At that time, lending programs were adopted so that people would be able to purchase homes. Later, after World War II, the 1949 Housing Act was passed. It established the goal of 'a decent home and suitable living environment for every American family' (Palm, 1979, 92). The maintenance of decent, affordable housing for citizens is considered to be very important by the federal government.

The 1980s were a decade of economic growth with housing inflation occurring throughout the country. The legislation which had been passed following the 1970s boom seemed to have protected the housing markets from again breaking out for the upside. But is the housing market situation under control or is it

just in a state of dormancy? Experts would probably argue both ways. With the continued increase in housing costs it would appear that the housing market is active, although what is actually occurring may not be perfectly clear.

The 1970s boom in housing economics was not confined to the United States. For example, Canada experienced a boom which began prior to the one in the United States. Other countries also experienced growth but the boom by no means occurred at the international level since some countries experienced declines during this time (Scheffman, 1978). This irregularity in market behavior makes the housing market structure difficult to understand. If national markets behaved more regularly, analysis would be easier.

Importance of Housing Studies

Housing is primarily an economic topic but it has a variety of dimensions which could be examined by several disciplines. The monetary aspects, the fact that housing is a good which can be sold for a price, makes it an economic topic. The way in which housing conditions vary over space is geographical. With the governmental structure of the national, state, and local levels providing legislation that influences housing locations and conditions, political science becomes a facet. Finally, the socioeconomic structures of cities and neighborhoods will connect sociology to the study of housing policies.

It can be seen that the topic of housing could be studied in numerous ways from several different perspectives. The overall

goal of housing studies is to gain a better understanding of how housing markets function. By understanding their operation, experts hope that they can manipulate markets so that they may become better organized and function more efficiently. This efficiency could mean better organization and use of urban land or housing markets which would be fairer to the majority of the people.

After determining what the desired housing market situations are, the steps of arriving at that point would have to be implemented through the use of government legislation. However, the policies passed to date have seldom aided citizens as they were intended (Muth, 1969). Before widespread policies are adopted, previous policies must be reviewed to see what effects, both positive and negative, they have had upon the population.

The most important concern in the housing market would have to be the rapid escalation of home costs. What effects will these increasing costs have upon the average American household (Downs, 1978)? Currently the housing market does not seem to operate fairly; minorities are seen as the people who are experiencing the greatest affordability crises at this time (Goldberg, 1983). Even though the affordability concern has not reached crisis levels for all people in all parts of the United States, it appears that it is going to be a growing problem. Past and the current situations need to be further analyzed to help predict the situation which may lie ahead (Gruen, Gruen, and Smith, 1982).

The purpose of this study is to examine the regional structure of the United States' housing market. The variability of housing

costs in metropolitan areas throughout the country will be examined between the years of 1982 and 1989. Factors believed to cause this variation will be analyzed and the findings discussed.

CHAPTER II

LITERATURE REVIEW

With housing costs being a common topic of discussion it
seems surprising that there has been so little written about their
variability. Of the studies that have been done, most have focused
upon the local, rather than regional or national situations. The
subject matter of these studies has usually examined how a single
variable or group of variables has influenced housing costs in a
particular metropolitan area. They usually discuss how the
variables that are studied affect supply and demand for housing and
thus housing costs. To review the literature, four areas will be
discussed: 1) national studies, 2) local studies, 3) demand
influenced studies, and 4) supply influenced studies.

For the purposes of this study, primarily literature about the
United States' housing market will be examined. This does not mean
that research has not been done in other countries, just that these
are not important for the study at hand. In fact, some of the most
extensive studies on housing have been done in Great Britain and
Canada. A few of these will be mentioned due to their importance.

Studying housing costs is a relatively new idea since it was
not until the 1970s that home prices began their rapid escalation
and tremendous variability throughout the country. Most of the
reviewed literature has been written since 1965. While earlier

studies certainly have been done, most of these findings would have been either replicated or nullified by the more recent studies following the 1970s price escalation.

National Studies

Studies of the national housing market have not received a great amount of attention. The studies that have been attempted have looked at how a small number of variables seem to effect housing costs in a select groups of cities. Kain and Quigley (1970b) pointed out some reasons why national studies had rarely been attempted. The empirical complexity of studying many variables at many locations required large, complete, and accurate data bases which previously had been difficult to assemble. With computer technology and widespread data availability this previous roadblock has been virtually eliminated.

A review of some early housing studies in Great Britain and in the United States was presented by Ball (1973). He mentioned that the results of different studies, studying different variables, holding different items constant, in different housing markets should be taken lightly. A successful model of housing markets could only be developed by learning from earlier studies.

Ozanne and Thibodeau (1983) questioned why the national housing situation continued to be largely ignored by research for as long as it had. Even in the field of economics, no complete, comprehensive studies existed. In their study, Ozanne and Thibodeau examined both housing and rental costs in the largest metropolitan areas throughout the country. They found rental costs

to be fairly predictable throughout the country, but housing costs were in need of much more intensive study before they could be understood.

In geographic literature, few studies have been done on housing costs. One study was done by Stutz and Kartman (1982), who examined home affordability in the largest SMSAs for the year 1981. They tested a regression model between housing costs and twelve independent variables and analyzed the results. Their research will be taken further in the present study by examining costs over a period of time, from 1982 to 1989, for a larger set of cities, and by studying additional variables.

The use of regression models has been a primary way for studying housing costs. Another method is by using hedonic price estimation to determine housing costs. Hedonic price estimation is based upon the idea, "that a transaction is a tied sale of a bundle of characteristics, so the price of a variety is interpreted as itself an aggregation of lower-order prices and quantities" (Eatwell, et.al, 1987). By using this method, the selling prices of heterogeneous houses are analyzed by determining the role of certain attributes in the price of those homes. The problems associated with these studies is that identical houses, with the same attributes, will sell for different prices in different cities and/or parts of cities (Goodman, 1978). No method is seen as being the best method for studying housing costs; more research needs to be done to form better models (Rosen, 1978).

Local Studies

More multivariable local studies have been done because data acquisition is much easier at the local level. These studies have been performed similarly to the national studies. Multiple regression models would be constructed for housing costs against physical characteristics and a variety of neighborhood factors (Grether and Mieszkowski, 1974). Carvalho, et al. (1976) expressed a need for these local studies stating that national government policies would vary based upon regional conditions. Still few of these studies have been done with most having been done in the 1970s.

One of the first books addressing the factors which influence local housing costs was written by King (1973). By examining the New Haven, Connecticut, housing market he determined a list of items to be the most influential in explaining price variation. In both this and another study (Wilkinson and Archer, 1973), the authors warned of possible empirical problems with data being used in the regression models. The problem of multicollinearity of data existed where variables could not be separated for study purposes since they were not independent of one another. Other problems exist since some of the data gathered could not be measured quantitatively because it was subjective in nature. The personal opinions and feelings of home buyers often determine if something is worth its asked price.

Reported housing costs can present problems depending upon whether they are based upon selling prices or market values

(Edelstein, 1974). Selling prices would be the actual prices which consumers end up paying for a home when they buy it. Market value is the estimated cost if a home was placed on the market for sale at a particular time. Market value often tends to underestimate the actual value of a home. If a better way of measuring market value existed, perhaps these data would be more useful. One last type of housing value which could be studied is assessed value. Assessed value is determined by local governments for local tax purposes. The problem with these data is that different political units use different value determination techniques to assess values, so the data are not comparable at the macro scale. However, assessed value would be a good source to use in a study within a particular city.

In attempting to better understand the San Francisco Bay Area's housing market, Palm (1978) discovered other potential problems. Determining boundaries for local studies is difficult since boundaries are seldom identical for different variables. Even though data tend to be available, they come from a variety of sources which often classify metropolitan and neighborhood boundaries differently. Palm (1977) also did extensive work on studying nonmarket factors which effect housing costs. Building restrictions, mortgage financing, and real estate agent behavior were all found to be influential in determining if homes were going to be available for sale and at what prices, to consumers. The findings of local studies vary due to differing local infrastructure, government policy, the statistical methods used, the level of aggregation, and the variables which are studied (Bourne, 1982).

While every local market behaves differently, each one could hold some information for gaining a better understanding the national housing market.

Demand Influenced Studies

Demand factors will influence housing costs depending upon what consumers request in terms of housing. Items that consumers will demand include a bundle of household amenities (size, number of bedrooms, presence of garage, etc.) and a suitable environment (proximity to work, neighborhood upkeep, neighbors, etc.). Several studies of demand influences on particular housing markets have been done (Quigley, 1978). Models are often constructed in which several variables are tested but with having only one particular demand variable being studied for its importance. Perhaps the most influential demand variable would be family income (Muth, 1969). This is because most factors can be more easily coped with than monetary ones. Not all variables, for example income, have been studied in depth since they are known to have an influence that is similar in all markets. Factors which vary between cities and parts of cities have had much more attention paid to them.

Housing Attributes

Consumers demand different services from a home; no one home could satisfy all consumers. Size of households, stage in the life cycle, and personal feelings will all contribute to a consumer's decision to buy. Since this is an accepted line of thought, it has not often been the subject of research.

The features of a home will add to its value. For example, Dinan and Mironowski (1989) studied the effects of fuel saving devices (storm windows, insulation, etc.) upon the cost of homes. They found that people were willing to pay more when purchasing a home in order to save money on utility bills in the future. In another study, the cost of home fuel systems were examined for their effects upon housing costs during the time of the 1973 oil embargo (Halvorsen and Pollakowski, 1981). At that time, higher costs could be asked for homes with fuel systems that did not operate on oil products. It is widely accepted that consumers are willing to pay for homes that have the amenities that they want.

Just as positive attributes increase a home's value, negative attributes can decrease home value. If a home lacks standard items or if items are in need of repair, a home's selling price will have to be lower in order for the home to sell. A home and its previous owner's reputation may also affect its price. If the house had been the setting of a murder or the previous owner had acquired a disease such as AIDS, these factors could reduce selling prices (Baen, 1989). In cases such as these, lower prices must be asked in order to make the sale if the historical information is known to a prospective buyer.

Geographic Setting

The geographic setting of homes also plays a key role in their values. Accessibility to frequent destinations, the geographical neighborhood setting, and the social neighborhood setting, are all important to people's home buying decisions.

An early belief in home cost variability was that there was a negative relationship between distance from the central business district and housing costs. The most expensive homes were usually found near city centers when cities first developed. The less expensive, outlying homes required greater travel expenses for their owners (Ball and Kirwan, 1977). However, once transportation methods improved, central business district accessibility seemingly became less of a factor in housing costs. With jobs being moved away from the central business districts to outlying suburban areas there was relatively little demand for homes adjacent to downtown areas.

Small (1986) found that increases in gas prices during the 1979 Iranian Revolution may have caused an increased demand for housing in some older areas adjacent to downtown Philadelphia. Perhaps some consumers were again voicing support for close proximity to the central business district due to increasing transportation costs. Today, with the days of the monocentric city being gone, new accessibility models are being proposed for study (Bender and Hwang, 1985).

Every house has an environment in which it is set. This includes everything that can be sensed around the exterior of a home. The most noticeable externality would be what is seen in the immediate area around a house. Surrounding land uses will play a key role in a house's setting. Most people would like to separate themselves from industrial, commercial, and other nuisance land uses. Although empirical evidence has not always supported that people are willing to pay more to separate themselves from

nuisance land uses, it still seems likely that they would (Grether and Mieszkowski, 1980; Nourse, 1963).

In examining the value of residential quality, Kain and Quigley (1970a) addressed urban blight in St. Louis, Missouri. They studied how renewal programs had effected surrounding neighborhoods. Renewal programs in the most dilapidated areas of the city were found to have been unsuccessful in improving living conditions, but in areas that were not in such poor condition, only in states of decay, renewal programs were found to improve conditions and thereby raise property values.

Property values react differently in different situations (Schall, 1971). For example, a new highway or other form of transportation may decrease property values within adjacent land parcels but raise property values that are only a short distance away (Dewees, 1976). With adjacent land perhaps having more efficient uses and with the feature being a nuisance land use, land values tend to lower. But areas that are set back further might see an increase in property values due to increased accessibility. The same idea holds true with regards to noise pollution around airports (Mieszkowski and Saper, 1978).

One externality whose affect has been debated is pollution. By studying property values downwind from industrial areas, several studies have tried to associate these areas with lower property values. Early studies supported that these areas tended to have lower values (Ridker 1967, Anderson and Crocker, 1971). But later, more extensive studies have not found any support for the hypothesis (Smith and Deyak, 1975). Conflicting study results are

quite common when studying the situations within different housing markets. Different models are often constructed in different settings for different studies which may produce this conflict (Wieand, 1973).

One last externality to examine would be the level of public services which are provided to neighborhoods. People are willing to pay for an increased level of public services (Schnare and Struyk, 1976). Nearby schools, well-maintained streets, efficient crime prevention, and other city services appear to affect property values. With an item such as the increasing amount of crime, it can be seen how people in certain neighborhoods appear to receive more police protection (Thaler, 1978). An increase in the level of services is usually financed through having higher local property taxes. The issue of property taxes will be addressed later as being a supply constraint.

Social Setting

The social setting of a house would refer to the people who live in the surrounding neighborhood of a home. Berry (1976) stated that:

> the metropolis is a spatially arrayed stratification system, with relatively homogeneous neighborhood submarkets differentiated and segmented by income levels and socio-economic status, race and ethnic affiliation, and age and the residents' stage in the life cycle (419).

While neighborhoods tend to be homogeneous in the kinds of people that are found there, they are seldom one-hundred percent dominated by a certain group of people.

Schnare (1976) found that areas that were made up of predominantly Caucasian households tended to have the highest property values. People were willing to pay more to live within these predominantly white areas. In the city of Boston it was found that housing costs in ethnic neighborhoods would be similar within themselves but different between one another (Schnare, 1974).

When predominantly white neighborhoods were infiltrated by "different" types of people, it has been hypothesized that property values would decrease (Bailey, 1966; Davis, 1971). However, this has never been proven and only appears to exist for the people who live in the surrounding neighborhood (Marcus, 1968). It has been often mentioned that minorities have been mistreated by the real estate industry. Do blacks and other minorities pay more for comparable quality housing than their white counterparts (Berry and Bednare, 1975; King and Mieszkowski, 1973)? Minorities are often thought of as living in ghetto areas. While ghetto areas are usually thought of as run down areas, their housing values do not necessarily reflect this. Even the idea of being run down does not always fit areas which are considered to be ghettos (Ford and Griffen, 1979). Though it would be hard to prove, it does appear that various discrimination and segregation practices are often carried out by realtors (Daniels, 1975).

Supply Influenced Studies

Supply factors will influence housing costs since the lower the number of homes that are available for sale will mean higher costs for these homes. A prerequisite for a new supply of homes to be built is that local factors will change and produce an increased level of demand. The actual amount of supply to meet this demand will usually be determined by local government policies. Depending upon how the local government feels about growth will determine how they may restrict or encourage new development.

Pubic policy will affect public housing, zoning, urban renewal, welfare payments, building codes, mortgage guarantees, and a variety of other items (Nourse, 1973; Seidel, 1978). Some people claim that it is this bureaucracy that is causing housing prices to rise above affordable levels. Muth and Wetzler (1976) studied supply and determined that supply constraints constituted about six percent of housing expenses throughout the United States. While how much of a role supply plays is debatable, it is known to be an influential part of housing costs. Since local policy is the primary influence upon supply, it will be broken down to examine three aspects: local land markets, property taxes, and development controls.

Land Markets

It has been hypothesized that land price inflation has been the leading cause for home prices reaching less affordable levels (Miller, 1981). But the results of at least one study have found that

high land prices are only a reaction to high home prices (Goldberg, 1977). The greatest land price increases have been in the Western United States but prices have increased throughout the country. Primarily where demand has been the greatest, the land prices have increased the most. While land cost used to be a small part of a home's cost, eleven percent in 1950, it has increased to being as high as fifty percent of the cost of homes in some areas at present (Manning, 1988). To understand this rise in land costs would be a study in itself; land costs needs to be better understood to help understand housing cost variability (Brigham, 1965; Black and Hoben, 1985).

Property Taxes

As mentioned earlier, cities provide services to residents based upon their collected property tax revenue. Cities annually establish budgets and set property tax rates. Barlev and May (1976) found that as tax rates were increased in Manhattan, there tended to be less new investment in construction and more building demolitions. The same situation would presumably occur in other locations. Often if taxes are raised by a local government, it is assumed by the citizens that the level of city services should also increase. If services are not increased then property values will tend to fall (Oates, 1969). It is up to local governments to know how high property taxes may be set, for the level of services which they plan on providing, without setting rates too high.

Development Controls

Researching local areas for public policy effects upon housing costs is going to be different in each city. Therefore it is difficult to determine a definite, nationwide relationship between housing costs and public policies (Urban Land Institute and Gruen Gruen and Associates, 1977). It is assumed that if a city supports growth, prices should tend to be more affordable then if they were to restrict growth.

In the 1950s and the 1960s, during a period of good economic growth, outward development occurred in many United States' cities. By the 1970s, many people were changing their attitudes and saw this consumption of land to be a waste. A variety of legislation was passed to begin to restrict this seemingly unending development in parts of the country (Black and Hoben, 1980). Since the early 1970s many cities have begun to restrict development more with the use of no growth policies, zoning ordinances, and other planning devices.

In Texas, the cities of Dallas and Houston differ in their views on new growth (Peiser, 1981). Dallas has restricted growth while Houston encouraged growth. Dallas provided utility services to new subdivisions so that the city could control what parts of the city new growth could occur within. However, in Houston, Metropolitan Utility Districts allowed land developers to determine where they wanted to build since they supplied utility services and passed the cost along to their customers. Local policies vary throughout the country, helping to contribute to the variability in housing costs.

To restrict growth, cities may adopt policies such as density zoning and land-use zoning to control expanding development. Density zoning requires that multifamily structures be constructed instead of single-family homes in certain parts of cities. Land-use zoning is used to separate different land uses. This policy causes homogeneous areas of residential, industrial, and commercial land uses to develop in designated parts of cities. This is done to maintain property values by preventing nuisance land uses from lowering values of nearby homes. However, the results may not always be positive since this restricts where housing will be built (Sagalyn and Sternlieb, 1972). Beaton (1982) studied the effectiveness of these and other types of growth restrictions upon urban growth boundaries in the state of Oregon and compared them to other cities throughout the rest of the country.

Dowall and Landis (1982) studied the San Francisco Bay Area and the different restriction policies of the over one-hundred local governments in that area. They found density controls and lack of land availability to empirically support increasing housing costs but could find no support for the contribution of zoning. Similar results were found by Mark and Goldberg (1986), but the authors caution that this might not be the case in all metropolitan areas. A Charlotte, North Carolina study is one example where zoning was found to be influential (Jud, 1980).

One last regulatory supply effect on costs could come from sources such as statewide regulatory agencies which form for purposes such as the protection of the environment. One region in California has had increasing housing costs since a statewide

environmental regulatory agency was formed (Frech and Lafferty, 1984). This regulatory commission which was to have aided the citizens of California appeared to have ended up causing harm to the social welfare of this region's residents. Public policy can have a variety of effects upon housing costs both positive and negative.

CHAPTER III

PATTERNS OF COST VARIATION

The concept of studying housing cost variability is not a new idea. This is because individual homes are heterogeneous entities. The bundle of attributes which a particular home possesses in association with its setting will determine its value. Different homes would be expected to have different values placed upon them. While price variability at the national level has been seldom studied, it has not been ignored.

An extensive, national home price study was done by Stutz and Kartman (1982); they examined the housing markets in the largest United States' cities. The home price data which they used came from the Federal Home Loan Bank Board and were averaged for a two-month period in early 1981. These data (Figure 3) showed that the highest-cost homes were found along the western, southern, and eastern margins of the United States. The "sunbelt" movement seemed to have produced high home costs in cities which had experienced inmigration in previous years. The lowest costs were found throughout the "rustbelt" region in the interior, Midwest region of the country. This area had been losing population in preceding years as people had moved away with poor economic conditions existing and few new jobs being available. The migration hypothesis was supported by the evidence presented in

AVERAGE HOME PRICES
- $110,000-135,000
- $85,000-110,000
- $73,500-85,000
- $65,000-73,500
- $0-65,000

1981

Source: Stutz and Kartman, 1982.
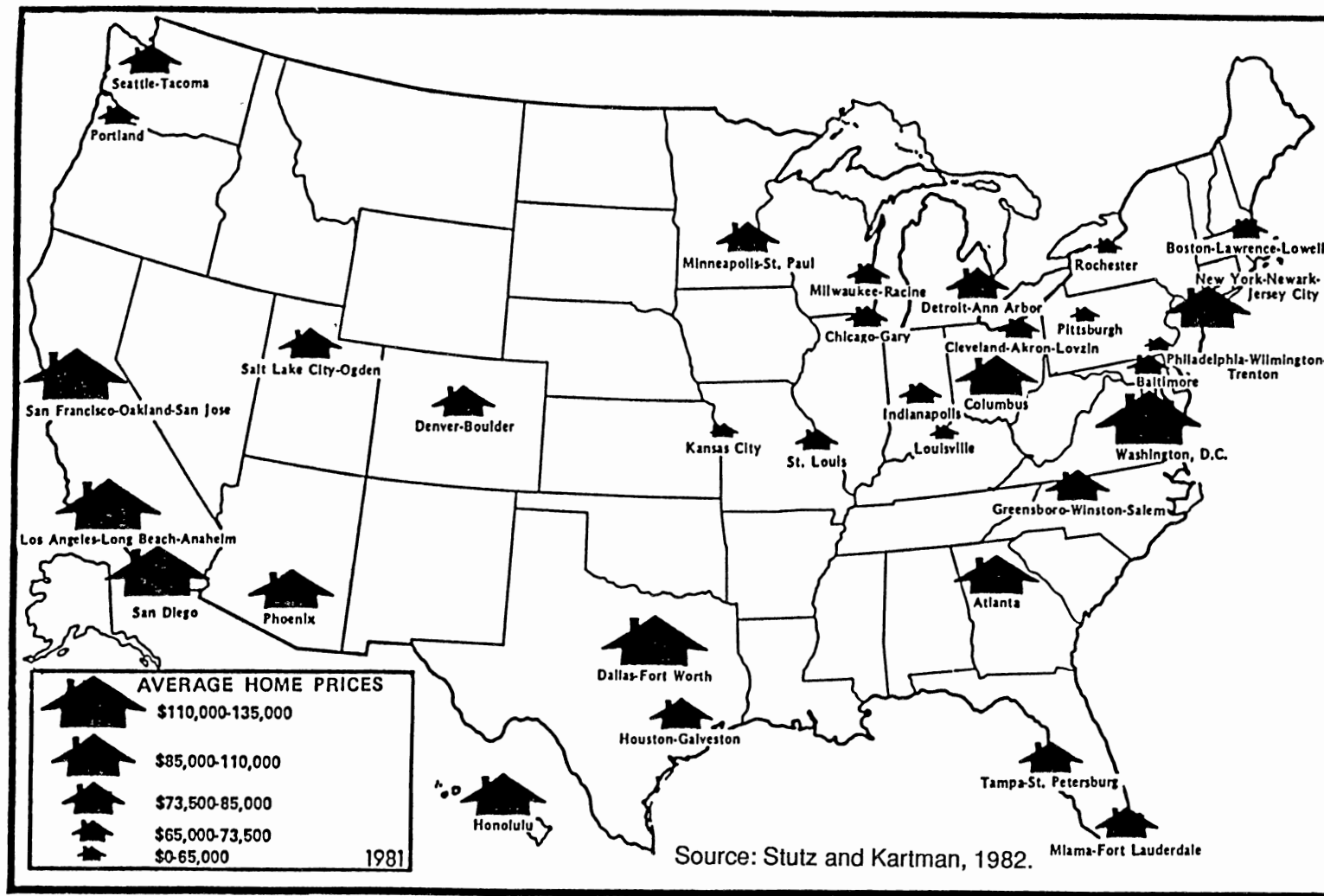
Figure 3. Average Home Prices, 1981

the study for how the mass movement of people effected housing costs.

Stutz and Kartman (1982) developed a regression model and tested the importance of twelve independent variables upon the dependent variable, housing costs. The independent variables were general in nature and were used to test how migration, increased demand, higher income, climate, and other items affected home selling prices.

This study will expand upon Stutz and Kartman's research by examining the patterns of variability which existed over a period of time, from 1982 to 1989, in the United States. In this chapter, a series of maps will be produced for each year during the eight-year period to demonstrate apparent patterns, and show how they changed during this period of time. The regions of homogeneous housing prices will be analyzed as to how, where, and why they developed. The overall price trends, from 1982 to 1989, will also be discussed to inspect national and regional housing markets. In the next chapter, a statistical analysis will be completed and discussed to update Stutz and Kartman's findings as well as to search for other explanations for price variability.

Housing Price Data

The source of the housing price data used in this study came from the American Chamber of Commerce Researcher's Association's (ACCRA) publication, the Inter-City Cost of Living Index. This source has been published quarterly since 1968. It provides information on the prices of a variety of commodities,

from hair shampoo and a pound of ground beef to monthly apartment rent and housing prices in a sample of United States' cities. Reported prices are also used to construct price indices to show variations in the cost of living.

The data that will be used from this source will be the average reported selling prices of new, eighteen-hundred square foot homes in each reporting city. Local chamber of commerce organizations retrieve and report the data for their city. Data errors and bias in gathering the information must be anticipated upon certain occasions. There is no way of picking these problem data out. However, by generalizing the data and by searching for patterns on maps, rather than attempting to explain each individual city's situation, these problem data will not cause any harm.

The American Chamber of Commerce data are useful at the macro scale, but they would not be very helpful at the micro scale. More accurate data exists on the micro level, such as assessed home values, which would be much more useful and should therefore be used. It should be mentioned that while this study focuses on variations between cities, extreme variation also exists within cities. In fact, greater ranges of housing costs would probably exist within certain cities than between the reporting cities at the national level. Considering these facts, it is seen that the selected housing cost data should work well in regards to the context of this study.

The Inter-City Cost of Living Index has some potential problems that must be mentioned. First, not all of the commodities have been reported, and in the same manner, since publication first

began. For example, housing price data as raw numbers have only been reported since 1982. Prior to this time, a monthly mortgage payment under certain established guidelines was reported. This is the reason why only the period 1982 to 1989 is addressed in this study.

A second problem lies in the coverage area. Only information that has been reported by local chamber of commerce organizations will be published. This presents a problem with coverage for a specific sample of cities over time, with not all cities reporting during every quarter. Large cities, such as Los Angeles and Chicago, fail to ever report due to difficulties in compiling accurate data. Nearby suburbs may report, but this often fails to provide the precise information sought. On the average, about two hundred and fifty incorporated areas report for each quarter. These places range in size from small farm communities to component parts of Metropolitan Statistical Areas. Despite having slight problems, the data provide information from a large, representative coverage of cities throughout the United States.

In this study, only data for reporting cities with populations over twenty-five thousand will be examined. This will be done to help aid in the production of maps and to make collection of other data for statistical analysis less constrained. On the average, the reduced sample contained approximately two hundred cities for each quarter. Data from the cities which reported at least once, for the second quarter period, between the years of 1982 and 1989 were used (Figure 4). A list of these cities and their reported housing prices during the period is found in the appendix.

Data Source: ACCRA.

Dots indicate incorporated areas which reported during at least one second quarter period from 1982 to 1989.

Figure 4.   Cities Reporting Housing Costs, 1982-1989

This study will only examine housing costs in the contiguous United States. The states of Alaska and Hawaii will not be studied due to their physical separation from the rest of the United States. The housing markets in these two states are influenced by variables which may or may not be as important as they would be to other states. Data for Alaska show that reported home prices tend to be above the national average (American Chamber of Commerce Researcher's Association). In the case of Hawaii, data indicate that some of the most expensive real estate in the United States is found here (National Association of Realtors). While these markets are important, they should not be studied along with the rest of the nation since they are so distinctive.

Map Construction

The assembled housing cost data were placed into a series of maps (Figures 6 through 13). Second quarter data from each of the eight years, 1982 to 1989 were used to produce these maps. All of the maps were constructed on a personal computer by importing the data from a spreadsheet program into a mapping program containing a basemap of the United States with the digitized locations for the sample of cities.

The map series was produced as a set of proportionate circle maps. Circles are placed over digitized city locations for each reporting city. The different sized circles portray the different reported housing prices. In addition to the circles for reported values, dots were used to show cities which reported sometime during the series but not for each particular year. This was done so

that it is possible to trace a particular city through the series of maps to see how its reported housing costs changed during the study period. Proportionate circle maps were used due to their accurate portrayal of location and their portrayal of value without the need of a legend to locate high and low-cost areas. The first maps in the series are primarily composed of large circles since the range of housing costs was not great. However, later maps in the series show more small circles since extreme high values increase the range of values for the circles to cover.

Another map was produced to show regions which displayed similar housing costs during each year of the eight-year study period (Figure 5). By grouping together areas with similar costs, certain regions became evident. Areas with few reporting values, such as the Northern Rockies were not included in any of the regions due to lack of data. The housing costs regions of this map will be discussed along with the map series in the following section.

Patterns of Variation, 1982 to 1989

The following section will discuss patterns and the changes in housing costs which have occurred throughout the United States from 1982 to 1989. Since economic conditions are important in determining housing costs, areas with healthier economies should have higher housing costs and vice-versa. Information pertaining to economic conditions in the United States and in particular geographic regions was derived from various issues of The World Almanac and Book of Facts and the Bureau of the Census' County Business Patterns. Five regions of the United States which
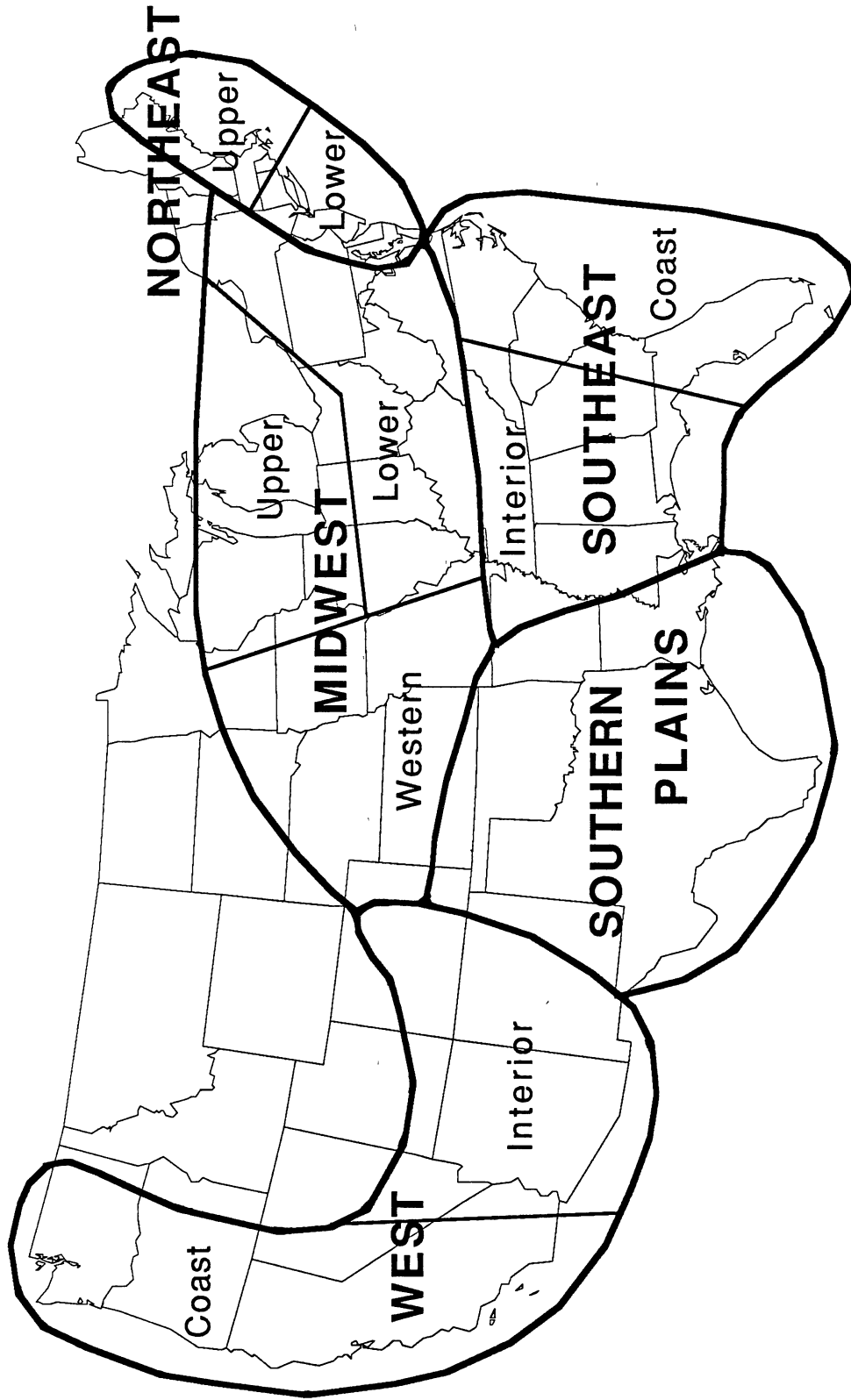
Figure 5. Housing Cost Regions

contained areas of similar housing costs will be examined through this period of time (Figure 5).

At the start of the study period, the United States was in the middle of a recession (World Almanac). In 1982 (Figure 6), regions with high housing costs were found in cities along the West Coast, in the Southern Plains, and in the Upper Midwest. A large area with low housing costs was found throughout the Lower Midwest region.

Western markets continued to expand just as they had in the 1970s. This was due to the growing population in these areas. People were migrating here from areas with poor economic conditions such as those in the Midwest and the Northeast. The previously mentioned "sunbelt" movement made people relocate to this region where there was an expanding number of jobs. This inmigration had produced higher demands upon the supply of available homes raising selling prices to unimaginable levels. All of the cities which reported the highest costs for the second quarter of 1982 were found in the Western region, particularly in California.

The Southern Plains region's economy was largely influenced by its oil resources. The high prices of foreign oil had increased the demand for domestic sources. The Texas and Louisiana Gulf Coast area had the resources to meet this demand. The oil industry brought many new jobs to this region which produced a multiplier effect in the local economies. A building boom began to stay ahead of demand with the provision of ample residential and commercial real estate. As expected, the active economy in this region pushed housing prices upward.

Reported Price:

○ $55,000-$62,500

◯ $62,600-$78,500

◯ $78,600-$102,000

◯ $102,100-$129,800

Median Price:

$77,667

Data Source: ACCRA.

Dots indicate non-reporting cities for the period.
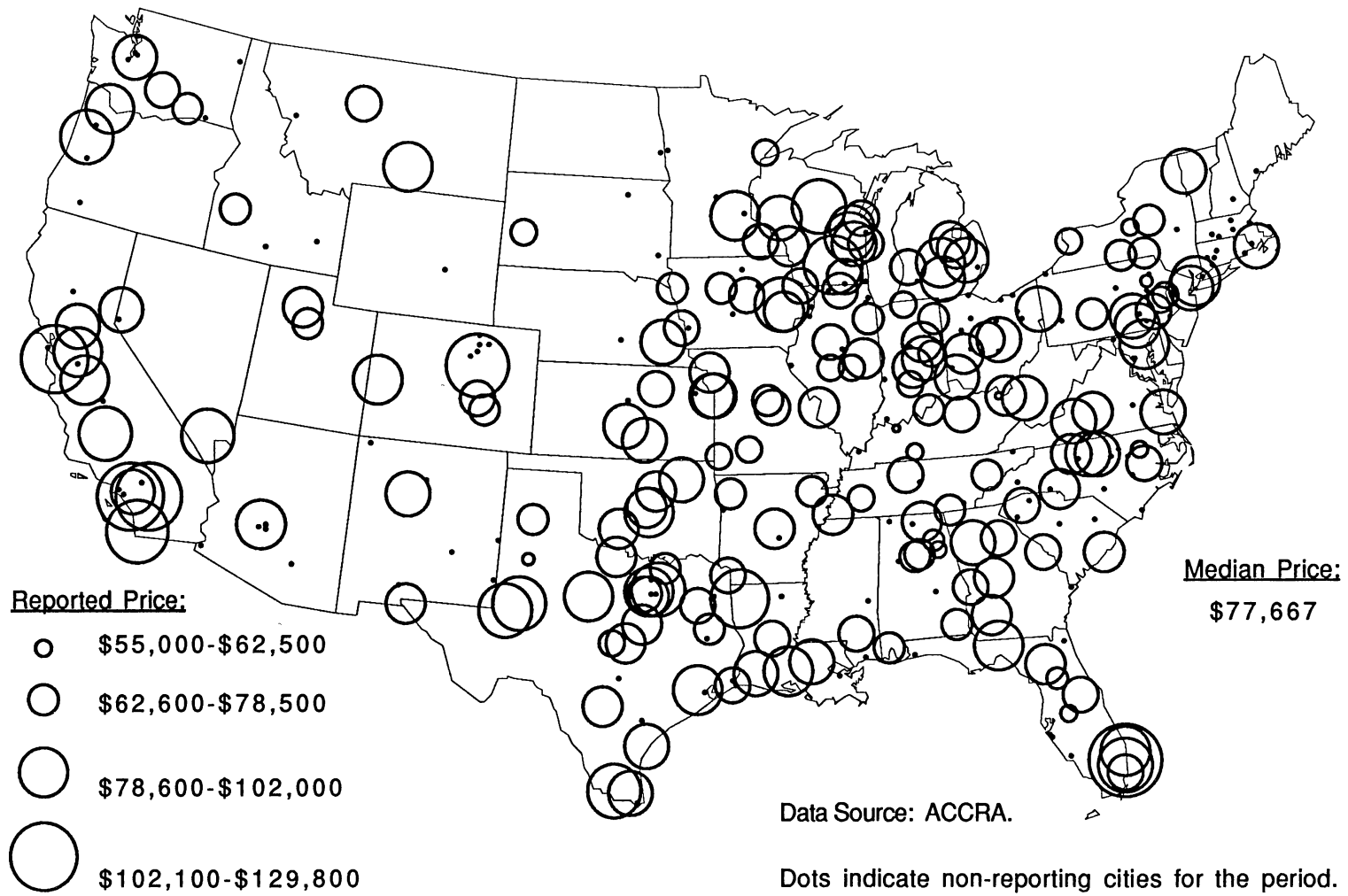
Figure 6.   Reported Housing Costs, 1982

Reported Price:

○ $53,000-$61,000

○ $61,100-$79,000

○ $79,100-$105,000

○ $105,100-$136,200

Median Price:

$80,000

Data Source: ACCRA.

Dots indicate non-reporting cities for the period.
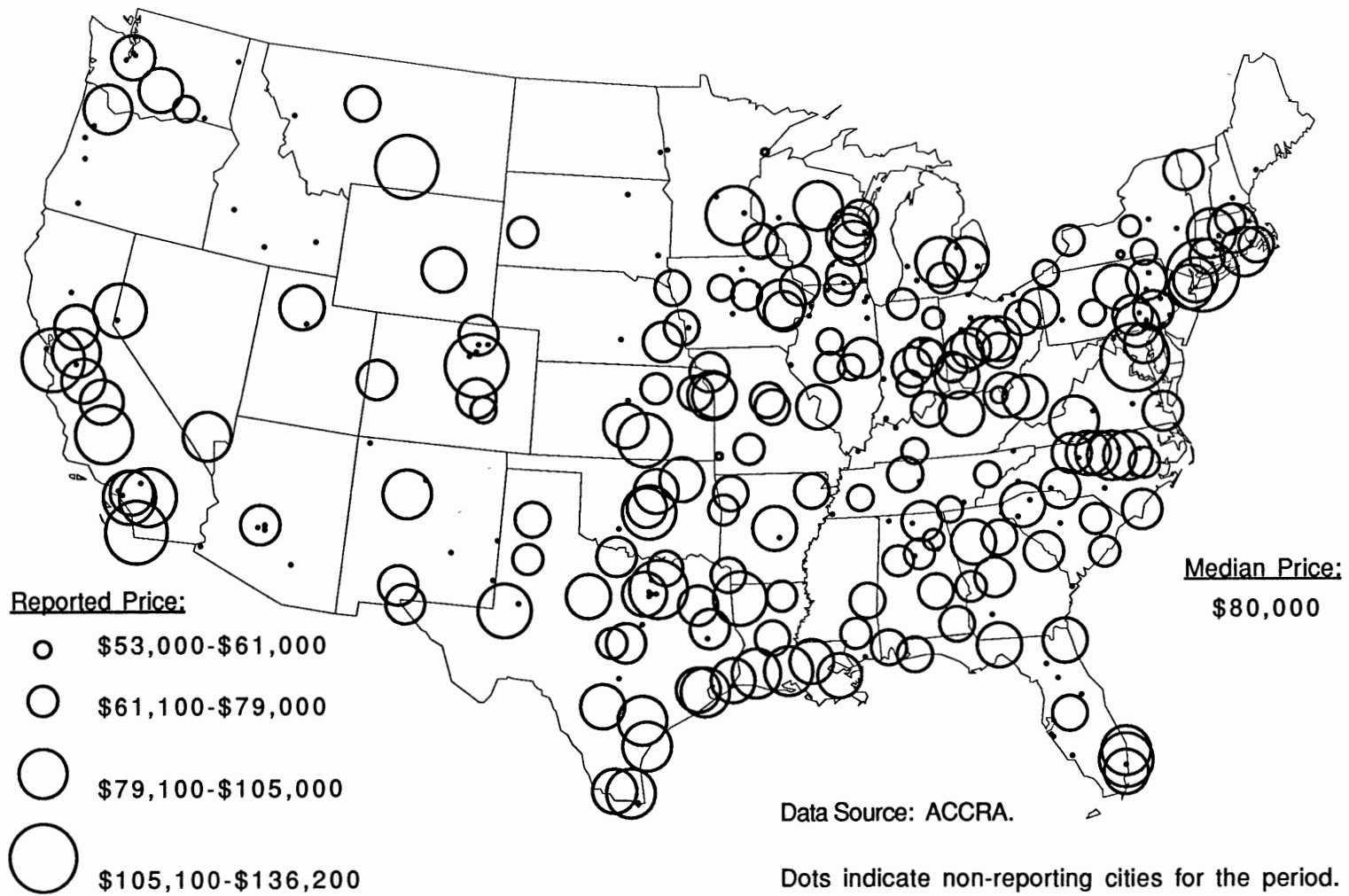
Figure 7.   Reported Housing Costs, 1983

Reported Price:

o $55,000-$63,500

O $63,600-$83,000

◯ $83,100-$111,000

◯ $111,100-$145,100

Median Price:

$82,000

Data Source: ACCRA.

Dots indicate non-reporting cities for the period.
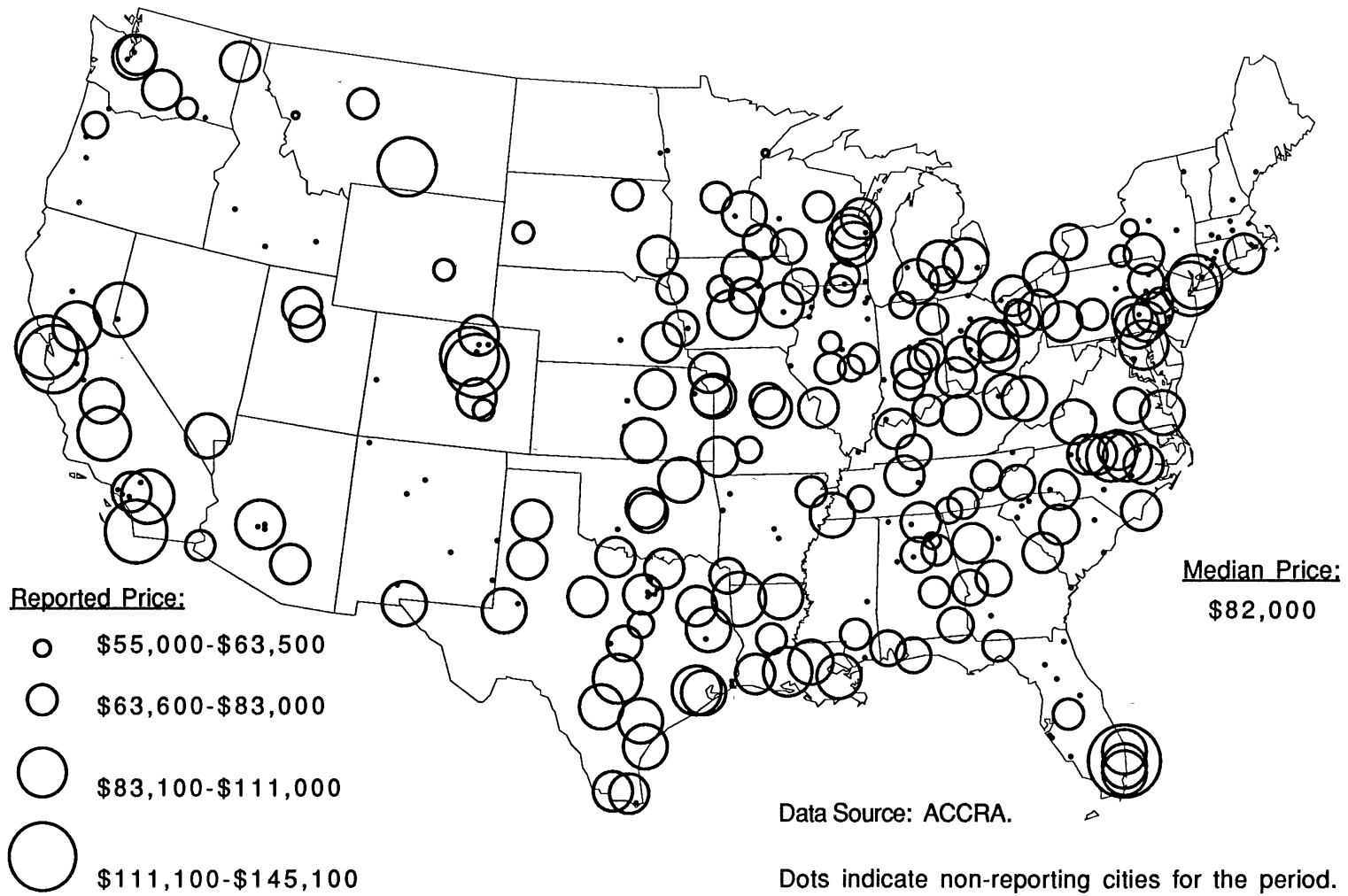
Figure 8. Reported Housing Costs, 1984

Reported Price:

O $55,000-$63,000

O $63,100-$81,500

O $81,600-$108,500

O $108,600-$181,300

Median Price:
$83,450

Data Source: ACCRA.

Dots indicate non-reporting cities for the period.
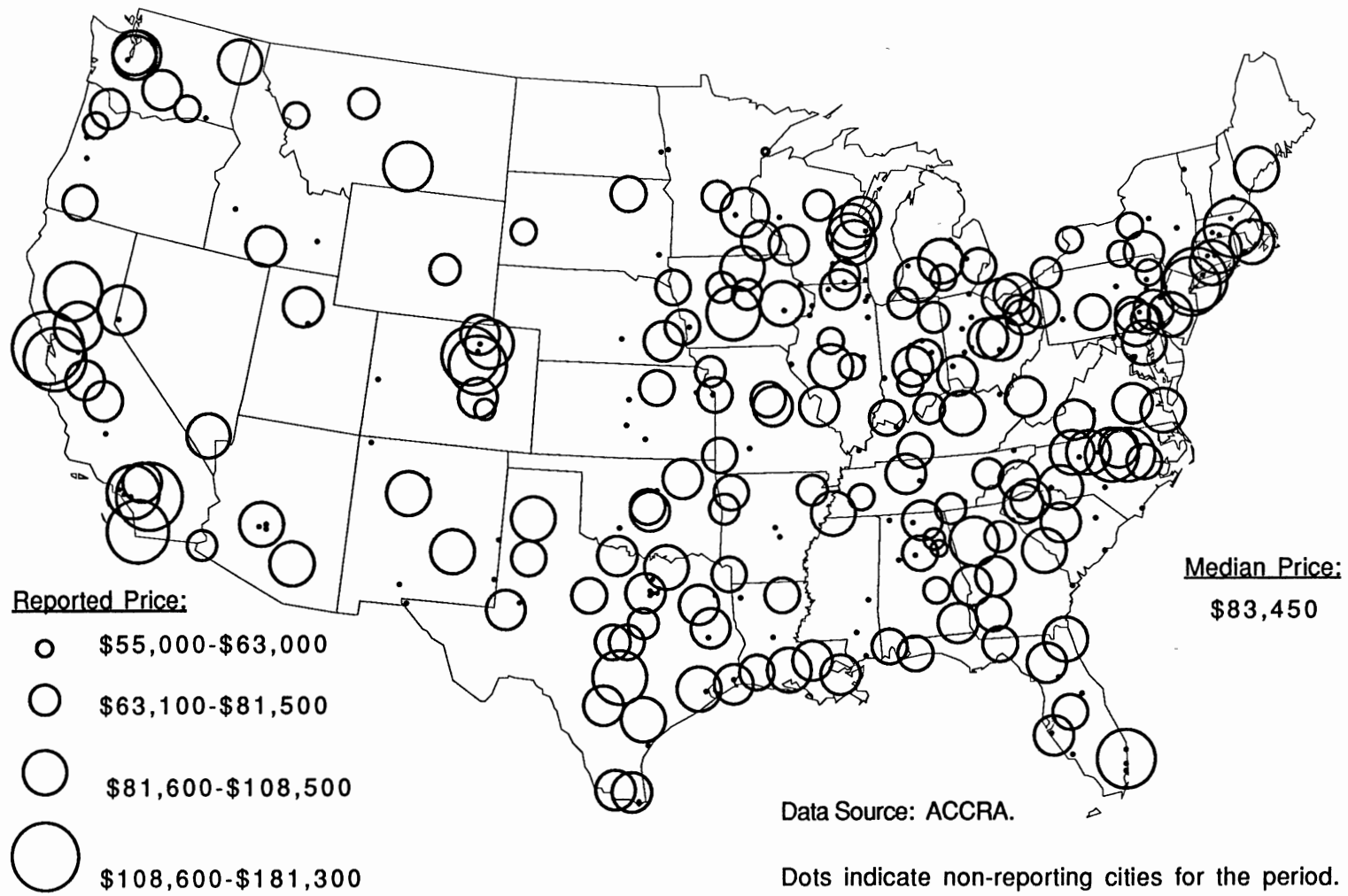
Figure 9.   Reported Housing Costs, 1985

44

Reported Price:

○ $63,500-$70,500

○ $70,600-$87,000

○ $87,100-$111,000

○ $111,100-$139,500

Median Price:

$85,150

Data Source: ACCRA.

Dots indicate non-reporting cities for the period.
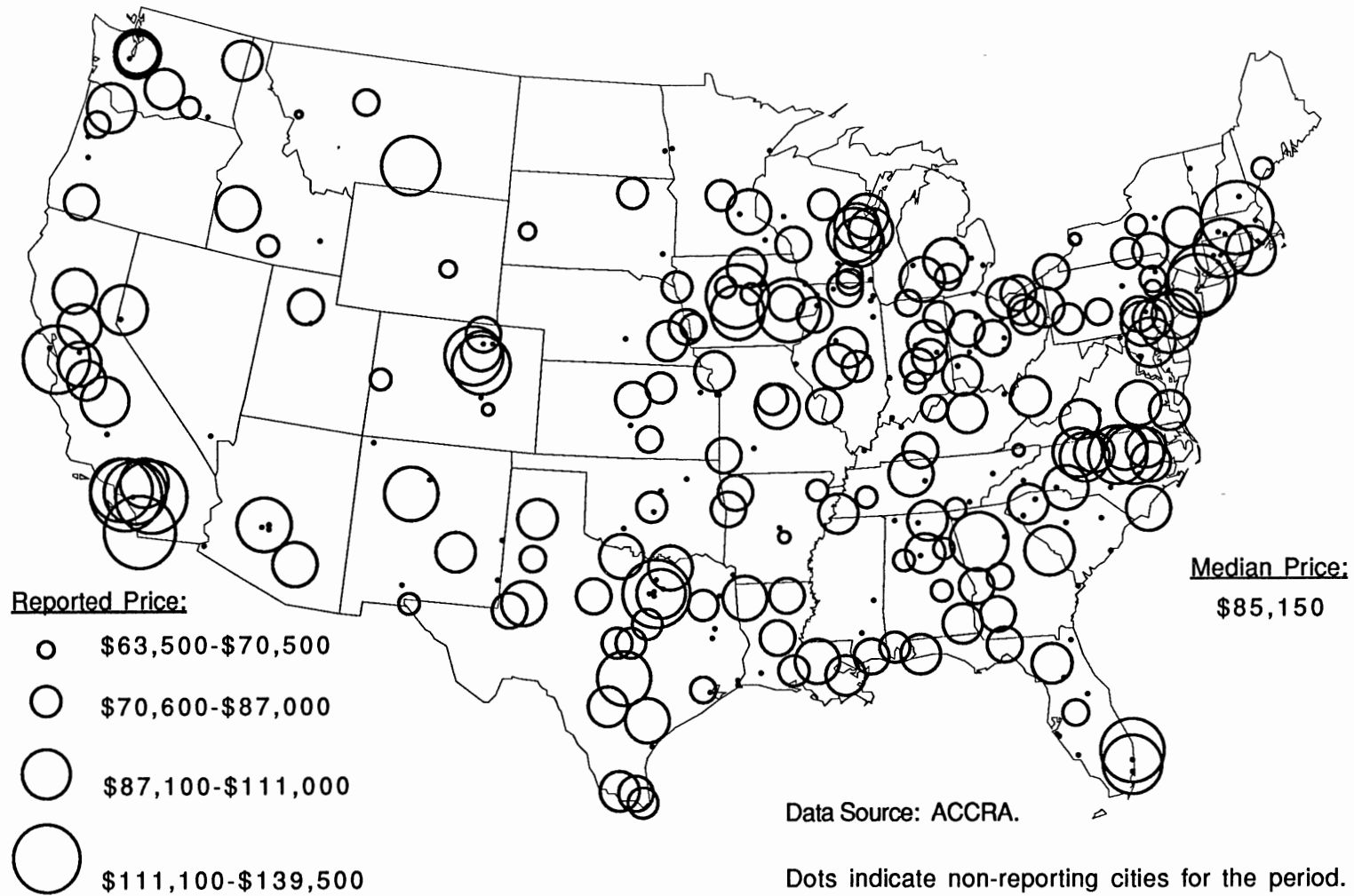
Figure 10.   Reported Housing Costs, 1986

Reported Price:

○ $67,500-$78,000

○ $78,100-$101,500

○ $101,600-$136,000

○ $136,100-$225,000

Median Price:

$86,466

Data Source: ACCRA.

Dots indicate non-reporting cities for the period.
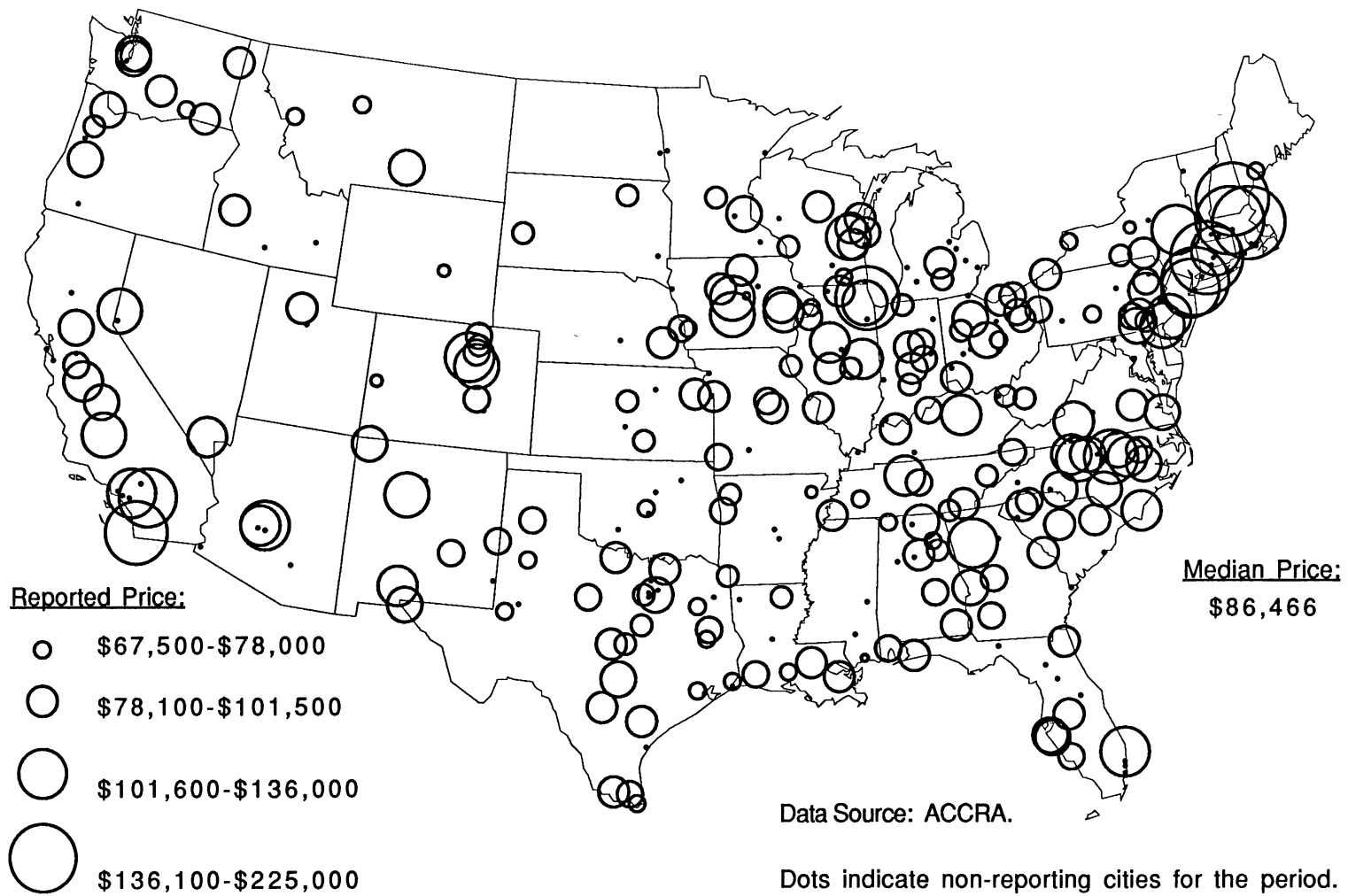
Figure 11.   Reported Housing Costs, 1987

Reported Price:

○ $61,500-$75,000

○ $75,100-$105,000

◯ $105,100-$148,500

◯ $148,600-$322,500

Median Price:
$90,000

Data Source: ACCRA.

Dots indicate non-reporting cities for the period.
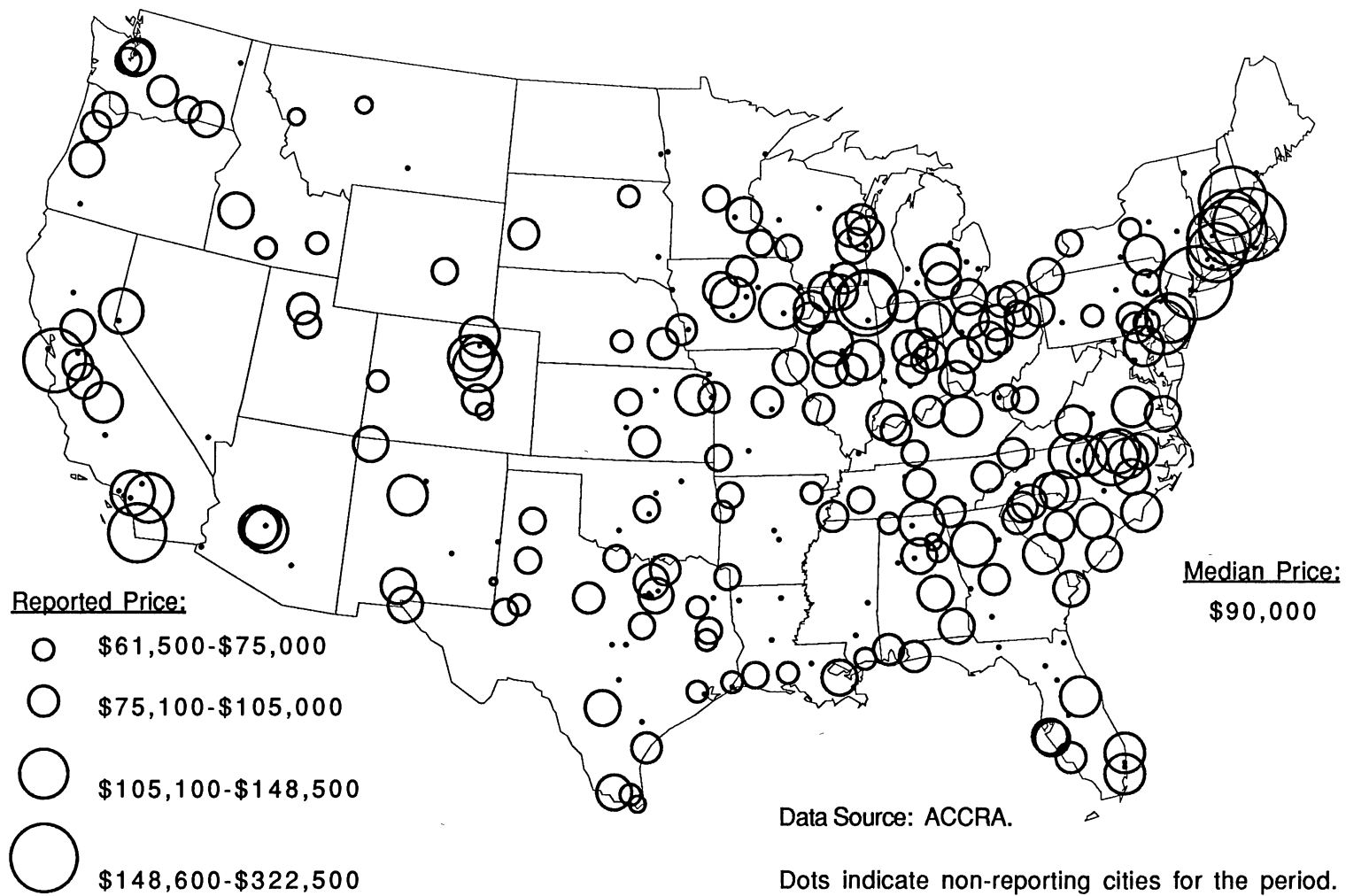
Figure 12. Reported Housing Costs, 1988

Reported Price:

○ $71,100-$82,500

○ $82,600-$109,500

○ $109,600-$148,500

○ $148,600-$195,000

Median Price:

$94,060

Data Source: ACCRA.

Dots indicate non-reporting cities for the period.
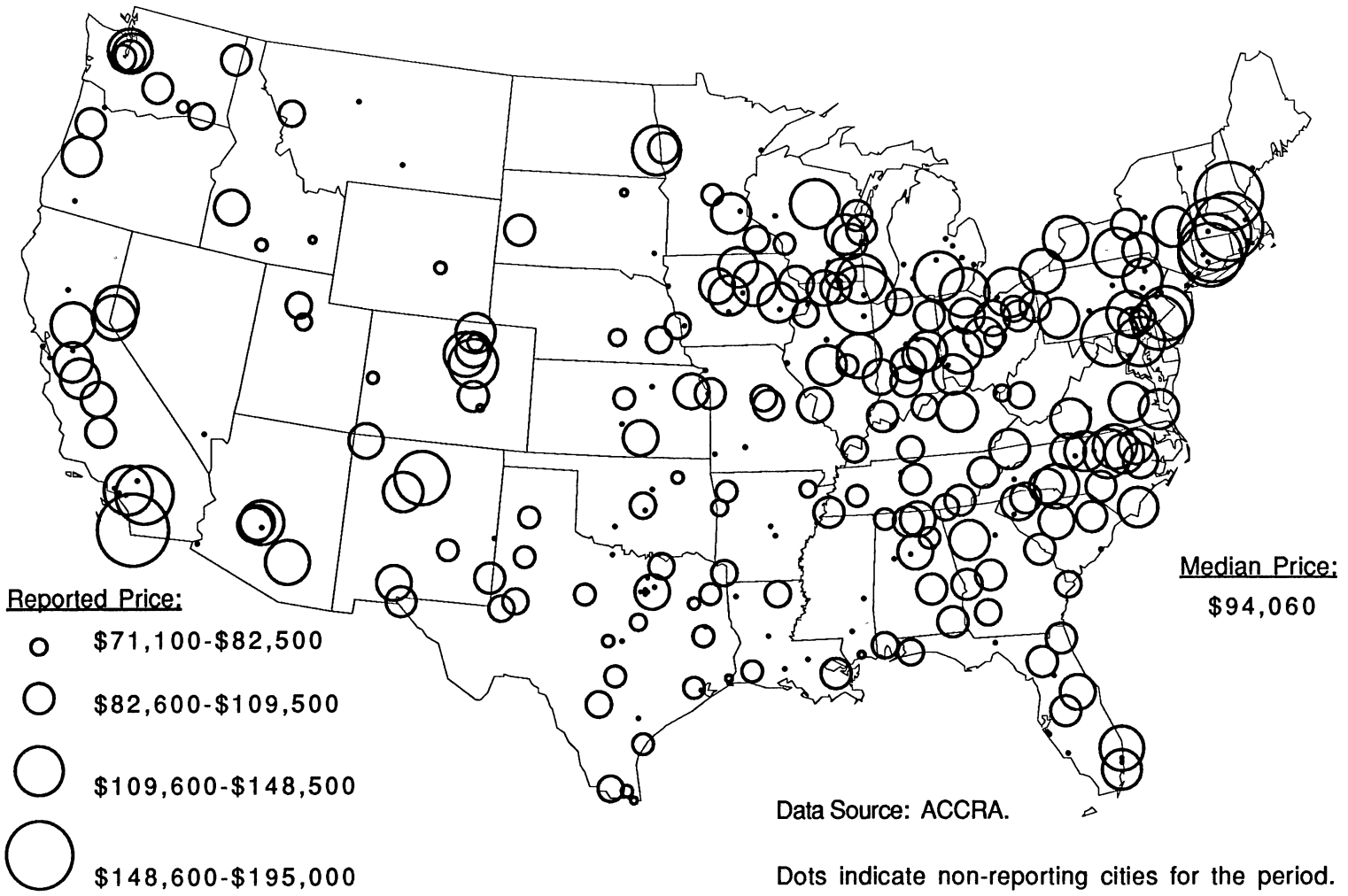
Figure 13. Reported Housing Costs, 1989

48

The Upper Midwest area was probably the least economically active of the three high-cost areas. The previously mentioned relocation of businesses and industries from the old industrial areas of the Midwest and Northeast had also affected this area. However, this region remained somewhat economically stronger than areas to its east and south. This may have been due to the economy of this area having been more diversified than adjacent areas. This region had diversified industries involving lumbering, dairying, and food processing, as well as heavy industry (County Business Patterns).

The area of low housing prices throughout the rest of the Midwest was experiencing severe, economic problems during the early 1980's recession. The abandonment of industry and the migration of people to other locations had left this area with an overabundance of real estate for which there was no demand. Housing prices had to be lowered in order for sales to be made. National unemployment was at record high levels in 1982, presumably with this area's economy suffering the most. Local economies had been so focussed upon certain types of industries that they were devastated when manufacturing plants closed and released workers. Many of these workers and their families had nowhere to turn and were forced to suffer through the recession or leave the area. Not until new, diversified economic development came to this region, would housing markets begin to recover.

One final area which stood out in 1982 stretched from the Western Midwest to the Southeast Coast. This area was not marked by a cluster of high or low costs, but rather average costs. Even

though this appeared to be an area of average costs, the recession had caused this and all of the other areas to have seemed like high-cost areas to those individual households which were suffering through the recession.

In 1983 (Figure 7), the nation's recession began to improve after bottoming out early in the year (World Almanac). However, this failed to help local housing markets in depressed areas. The ailing industrial region, which was centered on the Midwest, continued to be the dominant region as it covered a large portion of the Eastern United States. This region appeared to have expanded in size from the previous year.

The high-cost region which had existed in the Upper Midwest was brought down by the deepening of the recession. A few of the larger cities' prices stayed high even though prices fell in outlying areas of this region. The Southern Plains region continued under the influence of the oil boom; the economic woes of areas to the north and the east failed to harm these strong, oil-influenced economies.

The Western region continued to be an area with high housing costs. But only San Jose, California, was in the highest cost category in 1983. Other cities which had extreme high reporting costs included Washington D.C. and New York City in the Northeast region. While the previous year failed to have many reports from the Northeast, 1983 had enough cities report to show this as another high-cost region. High costs were found in the urbanized Megalopolis corridor from Boston to Washington. However, outlying rural areas were still largely affected by troubled economies

resembling those of the Midwest region. The diversification of economies as well as the large concentration of people living in the Northeast made this area less susceptible to economic downturn.

During the following year, 1984 (Figure 8), a similar picture existed over the United States. The Western housing market continued to be at the pinnacle with high costs found down the California Coast from San Francisco to San Diego. The Southern Plains region seemed to have contracted in size but was still evident as producing high housing costs; the low-cost Midwest region also appeared to have decreased in size. Average housing costs were beginning to become more common in places throughout the Midwest region. The government reported that the economy was stabilizing and that better economic times would lie ahead (World Almanac). The increasing number of average reported housing costs throughout the country seemed to support that the economy was beginning to improve.

Improvement continued throughout 1985 (Figure 9). Areas which had strong economies continued to reap the most from the benefits of the healthier economy (World Almanac). Cities in the Northeast and the West kept experiencing the highest housing costs during this year. The Midwest and the Interior Southeast had the lowest home prices as their economies were more sluggish and taking longer period of time to recover from their downturns.

The Southeastern Coast had shown tremendous turnaround by 1985. While areas to its west continued to struggle, the economic picture was much brighter towards the coast. From the Carolinas, to southern Florida, several reporting cities were above the

national average. Some items which may have influenced this were an increase in tourism and the migration of retired people into this region. Another region where these factors were believed to have had strong economic influences were in the Western region. In the southern Rocky Mountains, from Denver, Colorado to Albuquerque, New Mexico, local economies were largely supported by tourism dollars. Even in times of poor economic conditions tourism would continue to contribute to an area's economic foundations. This concept is seen in the cases of Denver, Miami, and places in Southern California throughout the eight-year study period.

The most pronounced change in the 1986 (Figure 10) map was the change in values which occurred in the Southern Plains. This region which had expensive home prices in the early 1980s experienced an economic downturn when the cost of foreign oil fell to its lowest levels in six years (World Almanac). The economy of this region was hurt drastically by this; no longer were its oil resources in demand. The building boom which had occurred earlier in the decade had produced an overabundance of new, residential and commercial properties which overnight were no longer in demand. This led home prices to decline sharply and rapidly throughout this region.

The Northeast, the Upper Midwest, and the West continued to be high-cost areas in 1986. The Interior Southeast continued to have the lowest home costs and the Lower Midwest, for the first time in five years, was dominated by average rather than below average prices. This indicated that the economy of this region was finally improving. This was also noted with the national

unemployment rate having fallen to a six-year low while bank lending rates were at a nine-year low. Both figures indicated that this was a time when homes would have been in high demand since they were affordable to a large number of buyers.

Recovery was again seen in the 1987 map (Figure 11). Many areas of high housing costs had overflowed into surrounding areas. The Northeast area produced high overflow prices further inland and into the Upper Northeast. For the first time, the majority of the reporting cities having the highest costs were found in the Northeast rather than in the West. The Midwest region continued to gain higher values showing that economic recovery was still taking place.

The Southeast Coast became the focal point for a new high-cost area after having been near average for several years. The Western region remained the haven of high housing costs while costs in the Southern Plains continued to fall. There were a growing number of low-cost cities found within the Southern Plains which became a region for below average housing costs.

The patterns of 1987, became further entrenched in 1988 (Figure 12). The highest reported costs continued to be found in the Northeast. The Western region also had several high costs reported and the Southern Plains had more low costs reported. In the case of Texas, the zone of low prices continued to expand in size.

By 1989 (Figure 13), the rich had gotten richer and the poor had gotten poorer. Expensive areas became more expensive with bargain areas becoming better bargains. The Northeast region remained the highest-cost zone in the continental United States.

This region's large population and it's growing service economy kept the economy active. Areas with large populations have large numbers of employees in retail trade positions. This is due to the number of people which must be served, who require goods to be supplied to them. Due to the same reason, there is high employment in service industries. People have a variety of day-to-day service needs that must also be met. The expanded service, or tertiary activities in Megalopolis, were also due to the growth in the eighties of business service industries. Large corporations with offices in cities such as Boston, New York City, and Hartford, in addition to smaller cities, began to rely on service industries which were to help aid them. Services such as consulting firms, photocopy/fax services, and accounting firms, etc. all developed to serve businesses. This was the apparent quaternary activity that has been hypothesized as a new type of economic activity beyond primary (agriculture, mining, fishing), secondary (manufacturing), and tertiary (service) activities.

The Midwest region had more cities reporting higher costs than it did in the previous year. This would be due to unemployment being at its lowest rate in fifteen years (World Almanac). At the same time, the Prime Lending Rate of banks rose to a five-year high. Even though less financing appeared to be available, home prices seemed high indicating that there was demand for homes in certain locations, though not everywhere. The Midwest region had entirely reversed its situation between 1982 and 1989; from being an inexpensive to an expensive area in terms of housing prices in only eight years. The change in local economies from manufacturing to

service industries greatly affected this region. Even though jobs were taken out of this area when plants were relocated, headquarters often remained which hired employees to work in new types of positions. Cities such as Chicago, Detroit, Indianapolis, and Cleveland are all examples of cities which survived this transition.

The zone of average costs for 1989 was found in a belt from the Western Midwest into the Southeast. This region was in the same location of the 1982 average-cost region. It can therefore be assumed that this region had experienced moderate economic activity during the eighties. While no great increases or decreases are seen over the eight-year period, home prices rose at a parallel rate to the national average.

The Western region was well above average again in 1989. During every year from 1982 to 1989, this area consistently had some of the highest reported housing prices. The boom in migration into this area and its strong tourist economy were key factors to its economic strength. This area looks to continue in its high housing cost behavior for years to come.

The final area to discuss for 1989 is the Southern Plains region. This area is another which reversed its trend over the eight-year study period. From high-cost to low-cost, the oil economy's downfall greatly affected housing values in this area. While the rest of the country appeared at or above average, the Southern Plains region was the only area which appeared to be below the national average. If this region behaves similarly to the Midwest zone, then the economy will eventually recover. With the

oil bust having occurred over three years previously, it seems that the economic situation should soon begin to improve in this region. With changes in the types of economic activities and the migration of people away from the area, improvement may already be starting to occur. If this region improves, what will happen to other areas? Will all of the regions become high housing cost regions, or will economic downturn produce downturns in other areas? What will the future hold for the national, regional, and local housing markets?

Overall Patterns between 1982 and 1989

To examine the overall change in housing costs through the eighties a map of change was constructed (Figure 14). The cities which reported in both 1982 and 1989 had their differences determined over the eight-year period. Next, the differences were divided by the difference between the median values of each year's (1982 and 1989) sample. This developed the percentage of average change for the list of one hundred and seventeen cities. A percentage value of 1.00 would indicate that a city's housing costs increased at the national average. The resulting map shows areas which both increased (above 1.00) and decreased (below 1.00) in their reported housing values.

The first category classifies places which had decreased in value between 1982 and 1989 (-0.84 to 0.00). A cluster of these symbols was found in the Southern Plains area of the United States. The states of Texas, Louisiana, and Oklahoma, which had experienced the oil bust in 1986, had their housing values decrease

Percentage of Average Change:

✳ -0.84 to 0.00 Percent Decrease

◯ 0.00 to 0.60 Percent Increase

◯ 0.70 to 2.00 Percent Increase

◯ 2.10 to 4.65 Percent Increase

Average Increase:
$17,060

Data Source: ACCRA.

Dots indicate non-reporting cities for 1982 and/or 1989.
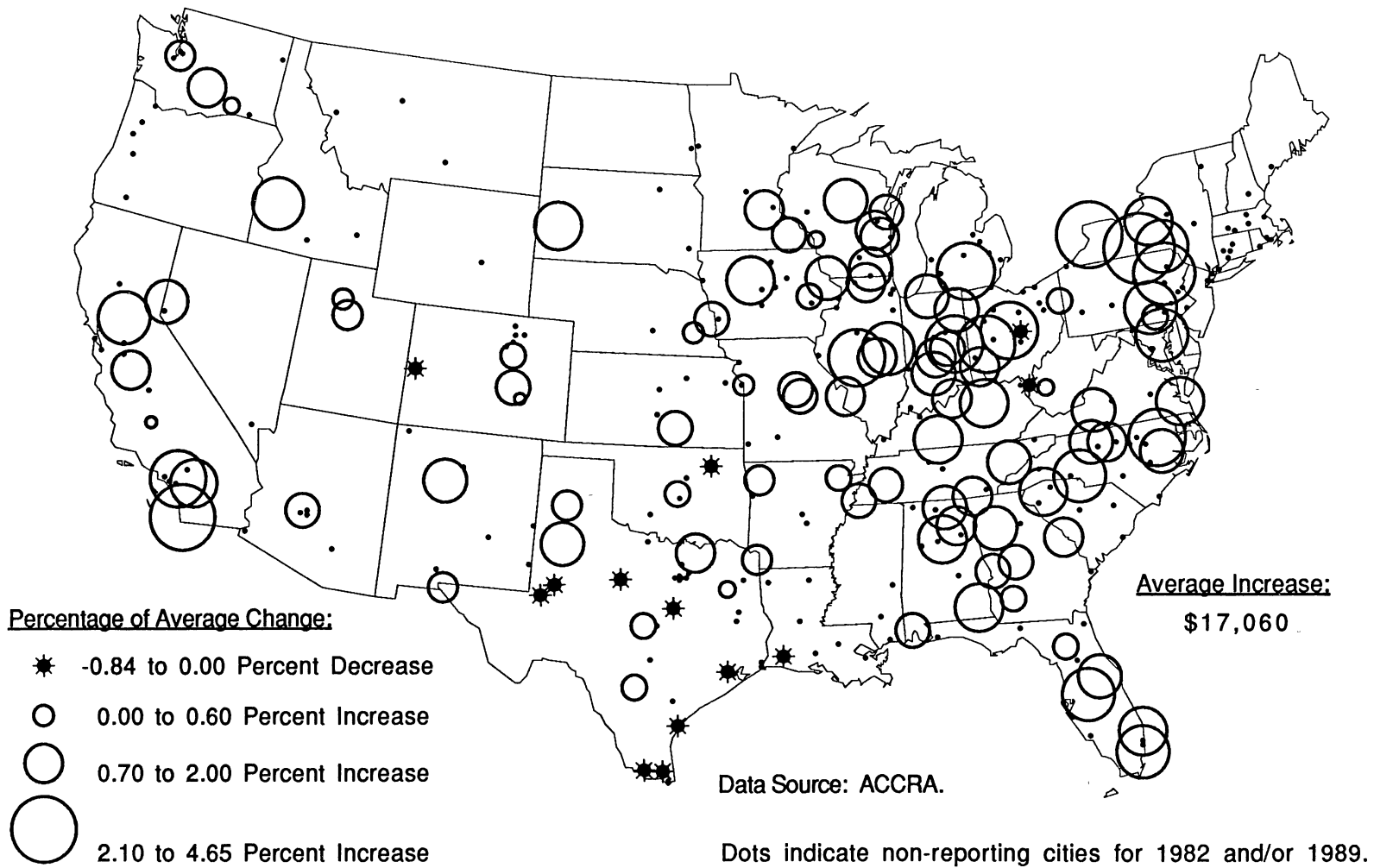
Figure 14. Changes in Housing Costs, 1982-1989

rapidly after 1986. The cities of Tulsa, Oklahoma, and Midland, and Odessa, Texas, had their housing values decrease over sixty-five percent of the national median change. This economic downturn greatly influenced housing values by decreasing demand for homes in these areas.

Areas which experienced little growth in housing prices (0.00 to 0.60) were concentrated in the Western Midwest and the Southern Plains, and were scattered in the Interior West and the Lower Midwest in the central Appalachian Mountains. These areas were perhaps affected by the oil industry in the South, agriculture in the Western Midwest, and mining industries in the West and in the Lower Midwest. Slow growth and declines in these economic activities might have contributed to these slow growth situations.

Average home prices (0.70 to 2.00) were scattered throughout the country but were concentrated in the Midwest and the Southeast. These areas were places whose recoveries had occurred at parallel rates to the country's recession improvement. Poor economic conditions had existed early in the decade in many of these areas with more optimistic situations existing by the end of the decade. Diversification of industry had helped former, large-scale manufacturing areas to rebound.

The areas with the highest growth in housing costs (Above 2.10) were found in the West and in the Midwest stretching to the Lower Northeast. Due to the failure of cities in the Upper Northeast to report in 1982, a large change is not seen throughout the Northeast over the period, but it would be expected. The California situation could be tied to the continued migration of people into

this state causing increased demand for housing with limited areas for development. The Midwest and the Northeast areas appeared as they did due to quick turnarounds in manufacturing areas as well as the growth in tertiary activities. The growth in the business service industry was phenomenal in the 1980s. Even though manufacturing may have left these areas, many new jobs were created as areas increased their tertiary economic activities. The highest growths in housing costs were found in Wilkes Barre, Pennsylvania (2.73), Buffalo, New York (3.08), Elmira, New York (3.47), and San Diego, California (4.67). All of these cities experienced great growth in the 1980s.

The primary changes over the 1980s included a fall of the housing prices in the Southern Plains and a rise of those in the Midwest/Northeast. Through reviewing materials on housing cost variability in the 1970s, the overall pattern had been growth in California and the West and decline in the Midwest and Northeast. Even though large-scale patterns such as these take periods of up to five to ten years to develop, small patterns can be seen developing and changing from year to year.

<center>Implications upon Affordability</center>

The reason why housing cost studies are so important is because of the implications associated with high housing costs. When the purchase of a home is made, it is an investment which will cost the purchaser a great sum of money. People who invest the same amount of money, but in different parts of the country receive homes that are quite different. Home prices have rapidly

increased within the past two decades.   This has also kept increasing the range of price variation throughout the country.   So at the present time, are homes affordable to average buyers throughout the country?   In order to answer this, regional patterns of income would need to be examined and compared to the patterns of housing costs.   Homes in certain cities may appear to be expensive but without information on average household income in those particular cities only guesses could be made as to whether quoted prices were too high.

Studies of home affordability are prepared regularly by large realty companies.   Prudential Properties, formerly Merrill Lynch Realty, assembles a quarterly home affordability index based upon housing costs and household incomes in the nation's largest cities. Index data from the final quarter of 1989 were mapped in Figure 15. Out of the ranked one hundred and fifty cities, one hundred and twenty-five were in the set of cities examined in this study and therefore, appear on the map.

The home affordability index is calculated to determine how much of a burden it is for households to make a monthly mortgage payment based upon an average family's gross monthly income in each city.   At the time that this study was done, most lenders throughout the country required that the monthly mortgage expenditure (burden index) should not exceed twenty-eight percent of a family's monthly income (Tulsa World, 1989).   Figure 15 divides the data into four categories with the lowest index values representing the most affordable cities in which to live.

Burden Index Value

○ 8.8 to 17.0

○ 18.0 to 27.0

○ 28.0 to 42.0

○ 43.0 to 54.1

Median Index Value:

22.5

Data Source: Prudential Properties.

Dots indicate non-reporting cities for the period.
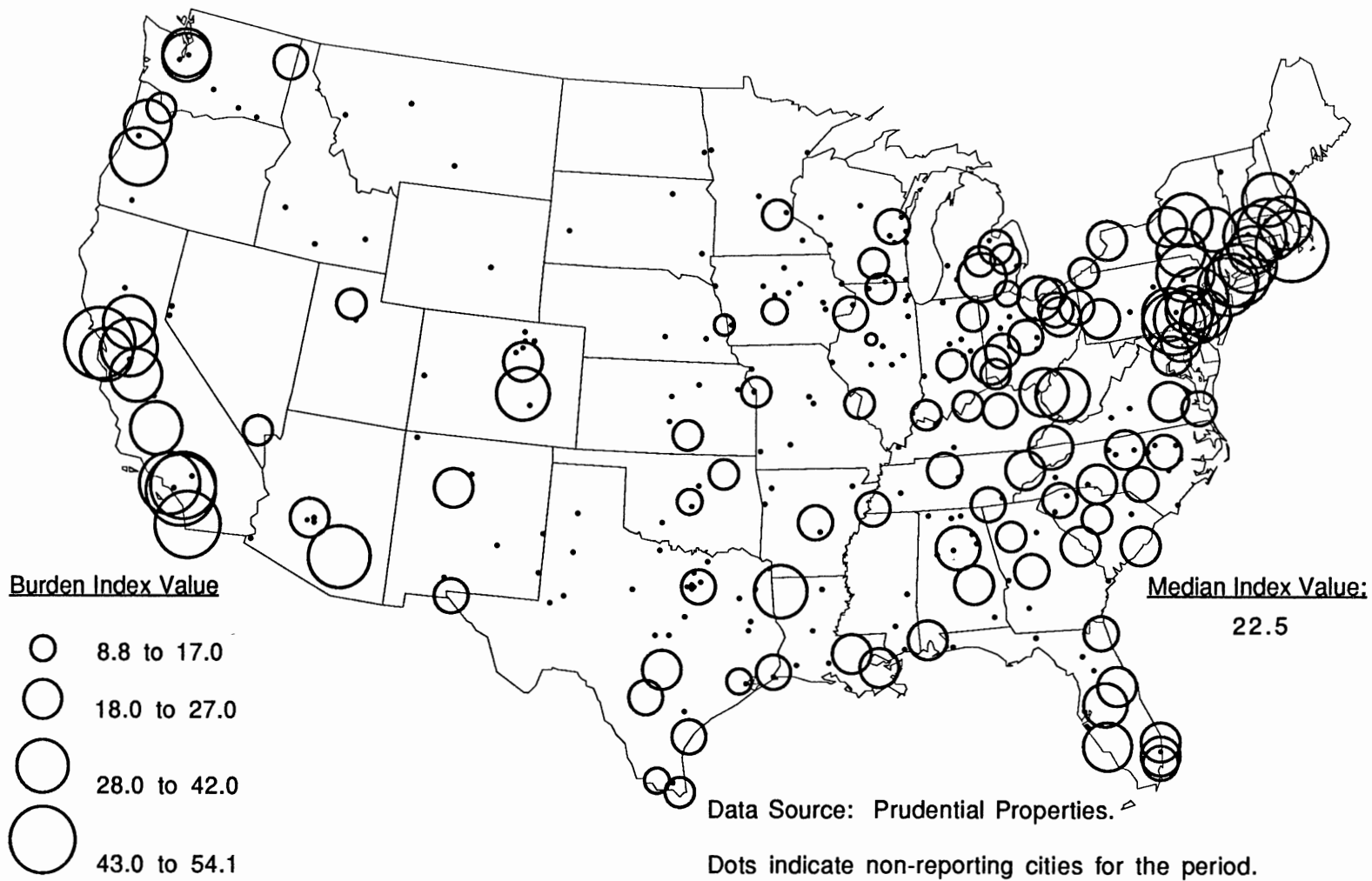
Figure 15.   Prudential Home Affordability Index, 4th Quarter, 1989

In reviewing this data, the most affordable homes were found to be in the Midwest and Southern Plains regions of the United States. In these regions, home costs were easily met based upon average incomes. The next level of affordability included a band of cities from eastern Texas in the Southern Plains region, across the Southeast. This category included the median burden index of 22.5. Much of this area would correspond to the average zone of housing costs found throughout the 1980s in the Southeastern United States.

The next level of cities began to top the twenty-eight percent burden index. Two main regions existed in this category, one zone along the West Coast and another in the Northeast. Both of these areas were closely tied to the high-cost regions that were discussed in this study. The economies in these regions expanded rapidly after the 1980s recession. The demands placed upon local governments in these areas for new housing units could not be met. Housing prices increased as the available supply of homes decreased.

The high-category values were concentrated in large urban areas. One zone in the Northeast, extended from Massachusetts to eastern Pennsylvania. Another zone extended along the West Coast with clusters existing around San Francisco Bay and Los Angeles. All of these areas were heavily urbanized. Due to there being little available land for new construction in these cities, the price of the existing supply was pushed upward. People who owned homes in these cities had made very good investments if they purchased them before prices sky-rocketed, but for people who wish to relocate to these areas and find affordable housing, they will be disappointed.

By examining the affordability data it is seen that they differ from housing price data. High-cost regions in the Midwest and along the Southeastern seaboard were actually shown to be affordable places in which to live. This is because high incomes help to supplement the expensive costs which are found in these locations. A study on home affordability would be a study in itself but it is important to mention that high housing costs do not imply that areas are not affordable places in which to live.

CHAPTER IV

ANALYSIS OF HOUSING COST VARIABILITY

In an attempt to better understand national variability in housing costs a statistical study was completed. In this investigation, housing cost data from 1987 were analyzed by studying how they were influenced by a variety of independent variables. American Chamber of Commerce, 1987 housing cost data were used since most other data were available for up to that time. If more recent data had existed, they should and would have been used along with more recent housing cost data. While this would have made the study more up to date, the data that were gathered, and that will be used, will provide an adequate analysis for the purposes of this study.

Data Selection

Only a select group of variables could be analyzed in this study; there are many others which could have been included. The data which were gathered were selected since they were believed to be related to housing costs on the national scale. The particular variables were chosen based upon previous studies and knowledge that had been gained up to this point in the study. Data were assembled for each of the cities which reported to the American Chamber of Commerce in the second quarter of 1987. Not all of the

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variables were available for each city; there were missing data values. For a few variables, statistics were representative for a pair or set of cities. An example of this would be Raleigh-Durham, North Carolina. Both Raleigh and Durham reported different housing costs in 1987, therefore other data that were shared as one number for the two cities needed to be divided up by using weighted averages. These weighted averages were based upon the 1986 populations of MSAs and component cities (Bureau of the Census, "Population Estimates", 1989). The following section will discuss the variables which were used in this study, where they came from, and why they were used.

The first group of variables were involved with local employment patterns. Employment change was the actual number of jobs that were created or eliminated between 1982 and 1987. The total number of 1982 jobs was subtracted from the number of 1987 jobs to get this variable. Percent change in employment was created as the percent change in jobs that occurred from 1982 to 1987. Employment change was divided by the number of 1982 jobs to get this statistic. By examining these two variables it will be shown what effects local employment changes have upon housing costs. Three more employment variables included the actual number of jobs in manufacturing, service industries, and wholesale and retail trade as of June, 1987. By using these three variables, an attempt was made to determine whether high or low housing costs were associated with certain types of employment. These variables came from two Bureau of Labor Statistics' publications with the

percent change in employment and employment change having been computer generated from other data.

The next three variables involved the degree of urbanization which cities possess. All of these variables came from the Bureau of the Census' County and City Data Book, 1988. The first variable was the total population of each city as estimated in 1986. If large populations are associated with high housing costs this will be a necessary piece of data. Perhaps population density might be even more important. This statistic shows how many people live per square mile in each city. Presumably, the higher the population density, the less space available for construction, producing higher housing costs. The last variable in this category is a measure of the local crime rate. This could be a social measure to see if high-crime cities have decreased demand for housing if people feel that they are not "safe" cities and do not wish to live in them.

The cost of living was the focus of another category. The three variables came from the County and City Data Book, 1988. Tax rate per capita based upon local government taxes was the first of these variables. Tax rates are high in some cities and very low in others. Property tax levels could greatly affect decisions for new construction of homes in different cities. Per capita income was the variable used to measure average local income. Areas with high per capita incomes should have higher housing costs since there may be more money in the local economies. The last variable was the expense of the average monthly residential electric bill in 1986. Climate's role may be seen here with warmer and colder areas perhaps having higher electricity bills.

TABLE I

DESCRIPTIVE STATISTICS FOR VARAIBLES,
ALL CITIES

Variable	n	Mean	Stand. Dev.	Minimum	Maximum	Range
Home Prices	212	91542.85	1550.75	67500.00	225000.00	154200.00
Change in Employment	145	38.12	66.74	-159.80	322.90	482.70
Manufacturing Employment	150	46.76	66.67	2.40	466.20	463.80
Wholesale/Retail Employment	150	68.32	101.48	4.80	769.60	764.80
Service Industry Employment	150	70.46	133.55	3.30	1257.00	1253.90
Population	212	195261.13	540741.05	25260.00	7262750.00	7237490.00
Population Density	212	3033.92	2413.89	407.00	24089.00	23682.00
Population Change	212	5.20	10.41	-11.20	57.10	68.30
Per Capita Income	212	10285.35	1518.74	5490.00	16773.00	11283.00
New Housing Units Authorized	183	8405.28	16161.07	33.00	99985.00	99952.00
Local Crime Rate	203	7589.65	2550.73	779.00	18081.00	17302.00
Residential Electric Costs	212	52.86	10.86	21.77	86.37	64.60
Local Taxes per Capita	212	257.97	151.94	52.00	1464.00	1412.00
Percent Change in Employment	145	0.11	0.11	-0.47	0.41	0.88

TABLE II

DESCRIPTIVE STATISTICS FOR VARIABLES, LARGEST CITIES

Variable	n	Mean	Stand. Dev.	Minimum	Maximum	Range
Home Prices	86	96256.00	24128.00	70800.00	225000.00	154200.00
Change in Employment	82	57.97	81.57	-159.80	322.90	482.70
Manufacturing Employment	80	72.96	81.90	3.70	466.20	462.50
Wholesale/Retail Employment	80	110.74	123.67	11.40	769.60	758.20
Service Industry Employment	80	116.83	169.46	7.40	1257.20	1249.80
Population	86	406533.10	805831.50	100290.00	7262750.00	7162460.00
Population Density	86	3578.37	3277.84	610.00	24089.00	23479.00
Population Change	86	5.67	9.95	-11.20	42.40	53.60
Per Capita Income	86	10461.58	1587.05	5490.00	16773.00	11283.00
New Housing Units Authorized	74	17532.54	22441.84	526.00	99985.00	99459.00
Local Crime Rate	85	8580.10	2345.40	4635.00	16937.00	12302.00
Residential Electric Costs	86	53.49	12.71	21.77	86.37	64.60
Local Taxes per Capita	86	325.09	190.69	113.00	1464.00	1351.00
Percent Change in Employment	82	0.11	0.12	-0.47	0.41	0.88

The final data category focused upon city growth. The two variables that were used came from the <u>County and City Data Book, 1988</u>. One variable was a measure of how much a city's population had increased or decreased between 1980 and 1986. An expanding population would increase housing demand while a decreasing population would decrease housing demand. The actual number of housing units that local governments permitted to be built from 1980 to 1986 was also examined. The greater the number of permits that were issued would mean greater demand for homes had existed.

The last variable, local housing prices, will be the dependent variable in the analyses. The factors which are related to and are influential in determining housing costs are what will be examined. All fourteen of the variables are summarized in Tables I and II. Table I represents a data set for all reporting cities and Table II represents the data set for the reporting cities with populations over 100,000.

Data Analysis

The data were assembled into a computer spreadsheet and saved into a file which could be read by a statistical analysis package. The statistical operations which were performed on the data included correlation and regression analyses. Correlation analysis allowed the relationship between the variables to be tested to determine if they behaved in similar manners. Correlation does not imply causality, that variables influence one another, only that they are related. The primary relationships of interest in this

study will be between housing costs and the other variables. The regression analysis was done to see which of the independent variables explained the most variation in housing costs. In regression, the goal is to see what variables, acting by themselves or in combination with others, will influence a dependent variable the most.

Both analyses were run on the two sets of data, one for all of the two hundred and twelve reporting cities and the other for the eighty-six cities with over 100,000 in population. In attempting to compare the larger and the smaller cities it is believed that the results will differ. The larger cities group should have consisted of cities over 500,000 or more in population, but due to few reporting cities having this large of population, a sample of cities over 100,000 was used. This was done so that the statistical results would still be significant for interpretation purposes.

Correlation Analysis

The correlation analysis was done by using Spearman's rank correlation. Due to the nature of the variables having extreme high and low values and large data ranges it was determined that a rank-order test would be best to use. The results of the correlation tests between housing costs and the thirteen other variables are included in Table III for the data set of all cities and in Table IV for the set of the largest cities. None of the coefficients had negative values, meaning that all of the variables had some positive connection with housing costs. Surprisingly, there were no strong relationships found between housing costs and any of the other

TABLE III

SPEARMAN CORRELATION RESULTS,
ALL CITIES

Variable	R	Prob>R	Observations
Employment Change	0.43697	0.0001	145
New Housing Units Authorized	0.40919	0.0001	183
Percent Change in Employment	0.38394	0.0001	145
Service Industry Employment	0.30738	0.0001	150
Population	0.29478	0.0001	212
Residential Electric Costs	0.29309	0.0001	212
Per Capita Income	0.28971	0.0001	212
Manufacturing Employment	0.28453	0.0004	150
Wholesale/Retail Employment	0.27125	0.0008	150
Local Taxes per Capita	0.22520	0.0010	212
Population Density	0.21863	0.0014	212
Population Change	0.19184	0.0051	212
Local Crime Rate	0.17537	0.0123	203

Correlation results between housing costs and all other variables.

TABLE IV

SPEARMAN CORRELATION RESULTS,
LARGEST CITIES

Variable	R	Prob>R	Observations
Employment Change	0.41150	0.0001	86
Percent Change in Employment	0.40346	0.0002	81
Service Industry Employment	0.33669	0.0023	80
Residential Electric Costs	0.33321	0.0017	86
Per Capita Income	0.32007	0.0027	86
Wholesale/Retail Employment	0.28007	0.0116	80
Manufacturing Employment	0.24874	0.0261	80
Population Density	0.19936	0.0657	86
Local Taxes per Capita	0.19875	0.0666	86
Population Change	0.18350	0.0908	86
New Housing Units Authorized	0.18034	0.1242	74
Local Crime Rate	0.14541	0.1842	85
Population	0.12283	0.2599	86

Correlation results between housing costs and all other variables.

variables. No correlation coefficients were found above 0.5 as it was anticipated when the study began. There are many factors besides those analyzed which are tied to housing costs since homes are such high-cost commodities.

The correlation results in Tables III and IV show employment change as having the strongest tie to housing costs for both data sets. An increase in the number of jobs would increase migration of people into the local area to fill these jobs. This would produce an increase in demand for homes and therefore increase housing costs. The percent change in job growth from 1982 to 1987 was also found to be significant, further showing the importance of new jobs in maintaining active housing markets.

Surprisingly the second highest value in the data set for all of the cities, housing units authorized for construction, ranked as the third lowest value in the correlation for the large cities. While smaller cities may require new construction when housing demand first increases, large cities may have sufficient supplies to meet initial demand. Only if growth was to continue for an extended period of time, would this factor become an influence in larger cities.

Another variable which behaved quite differently for the two data sets was the 1986 population. Population had the fifth highest correlation for all cities but was last for the set of large cities. Apparently city size is closely tied to housing costs until either housing costs or city size reaches a certain extreme. It is seen that in larger cities, population is not as closely associated with housing costs as it is in smaller cities.

Employment in service industries was within the highest four coefficient values in each set of results. The growth of service industries in the 1980s was phenomenal as was the nationwide rise in housing costs. The relationship between these two is seen in areas of the country such as California and the Northeast. Both areas had high service employment and the highest reported housing costs in the country. As this boom occurred in service employment, manufacturing employment decreased in many areas of the country but an inverse relationship was not shown between housing costs and manufacturing employment. Apparently due to the large number of workers that many manufacturing plants employ, and the money that goes out into the local economies, these industries greatly influence housing markets, especially in smaller cities.

Residential electric costs were found to be related to housing costs in both sets of results. It appears that areas with high-cost homes would also have high electric bills. While explaining the correlation between housing costs and electric rates is difficult it is seen that high electric costs would aid in the production of higher housing costs.

One variable that did not show much relationship to housing costs in either analysis was the local crime rate. Apparently crime rates are too localized within parts of cities to show any relationship at this level. In a micro study, this rate might be more important for studying housing cost regions within a particular city.

All but one of the coefficients in the group of all cities' results were found to be statistically significant at the 0.05 level

as were seven in the largest cities' results. A difference is definitely seen with significance levels deteriorating at a greater rate for the smaller data set which contained only eighty-six cities. Although these two tests show that none of the thirteen variables had strong relationships with housing costs, several did have some association.

<div align="center">Regression Analysis</div>

The regression analysis was done by using stepwise regression techniques to determine which variables and combinations of variables explained the most variation in the dependent variable. Three different types of procedures were performed, forward, backward, and regular stepwise regression. Each of these procedures works slightly differently but it is beyond the context of this study to go into the differences. In order to find the model that explained the most variation in housing costs, all three of these procedures were run. The two data sets, for all 1987 reporting cities and for those over 100,000 in population, were put through the three procedures. The results of the test for the group of all cities will be reviewed first, followed by the discussion of the largest cities' results.

The procedure which explained the most variation for the set of all reporting cities was the regular stepwise procedure (Table V). The coefficient of determination (R^2) was 56.96. This means that the model explained approximately fifty-seven percent of the variation in housing costs. This number was higher than anticipated after viewing the results of the correlation analysis.

TABLE V

STEPWISE REGRESSION STEPS, ALL CITIES

Step	Variable	R^2	Change in R^2
1	Service Industry Employment	0.2503	- - - - -
2	Residential Electric Costs	0.3672	+0.1168
3	Population	0.4259	+0.0587
4	Wholesale/Retail Employment	0.4791	+0.0532
5	Per Capita Income	0.5150	+0.0359
6	Employment Change	0.5445	+0.0295
7	Population Change	0.5537	+0.0091
8	Local Taxes per Capita	0.5696	+0.0159

TABLE VI

CONTRIBUTION OF VARIABLES ENTERED TO THE REGRESSION MODEL, ALL CITIES

Variable	Parameter Estimate	Contribution to R^2	F	Prob>F
Employment Change	85.56	3.6	6.34	0.0132
Wholesale/Retail Employment	-285.70	9.5	21.22	0.0001
Service Industry Employment	337.84	12.5	28.70	0.0001
Population	-0.03	10.5	23.69	0.0001
Population Change	352.52	2.8	4.43	0.0375
Per Capita Income	2.84	3.9	7.11	0.0089
Residential Electric Costs	695.36	10.8	24.51	0.0001
Local Taxes per Capita	27.11	2.6	3.99	0.0482
Variation Explained:		56.2		

The first variable found to be influential was local employment in service industries. This accounted for nearly one-third of the explained variation, which was much higher than was expected at the first level. Throughout each step, service employment was found to have the most influence, being far ahead of the other variables.

The next variable to enter the model was based upon monthly residential electric costs. This was an unexpected variable to find at this level. Perhaps the influence of climate is seen here with the role of air-conditioning expenses playing a role in the Sunbelt and heating expenses influencing the Northeast.

The third entry into the model was the 1986 population measure. This was another strongly influential variable with the size of communities apparently playing a large role in influencing housing prices. Few would argue that on average, smaller cities are cheaper to live in than larger ones. Actually the parameter estimate (Table VI) shows a slight inverse relationship between population and home costs in this context. Perhaps once a city reaches a particular size, population becomes a variable which deters costs. This could be done by presenting the image of a city being overcrowded making people decide that they do not want to live there.

An inverse relationship was also seen with the fourth variable, wholesale and retail trade employment. This may be an opposite effect of service industry growth. Service industries often have high-salaried employees, this is not the case with most sales industries. The high income of service industries employees

would mean more money for them to purchase more expensive homes. But lower incomes, such as those associated with wholesale and retail sales employees, would yield to less active markets having less expensive homes.

The fifth variable, per capita income, would tend to be higher in larger cities since the cost of living usually increases with city size. More income is needed in order to live in large cities. Common sense would explain that higher household and per capita income would be needed in areas where high housing costs were found. Without supplemental incomes, people would not be able to afford living in areas which have high housing costs.

Employment change from 1982 to 1987 entered the model at step six. Since employment change had the highest correlation coefficient, it was expected that it would have been the first variable to enter the regression model. In attempting to explain the late entry, it was determined that employment change and service industry employment must be inter-correlated. A great amount of the employment change which occurred in the 1980s occurred when people entered jobs in service industries. This connection is apparently what caused service employment to enter higher than expected and employment change to be lower than expected. Regardless of the level of entry, employment and types of employment play key roles in influencing housing costs.

Population change from 1980 to 1986, was no surprise entrant into the regression model. Places which are growing in terms of population usually experience an increase in demand for housing. Prices rise as the available supply of structures becomes limited.

In these cases, a seller's market exists since a seller can set prices and most often receive the price they request.

The last variable to enter at the 0.05 level of significance was the local tax rate per capita. While it contributed little to the model, it did show that higher taxes have some influence upon housing costs. The taxes which would be most influential would be property taxes. High property taxes are common in urban areas since there is much demand placed upon the limited supply of available land.

Table VI shows the relative contribution of each variable in the regression model. By dividing the type two sum of squares by the total sum of squares, the contribution of each variable was calculated. Due to the size of the numbers that were manipulated to get these contributions, the arithmetic is slightly off resulting in the sum variation being equal to fifty-six percent, just below the coefficient of determination of fifty-seven percent. The significance (Prob>F) shows that all eight variables are significant at the 0.05 level, half of these variables portrayed excellent levels of significance at 0.0001.

The regression procedure which explained the most for the large cities' data set was the backwards elimination procedure. The coefficient of determination (R^2) was 60.70, explaining approximately sixty-one percent of the variability in housing costs. Since this coefficient of determination is larger than the one for the data set for all cities it seems that it would be easier to determine the influences upon housing costs in larger, rather than smaller cities. This is also shown since the regression model for

the large cities selected only six variables as being significant while the other model had selected eight.

The backwards elimination technique works by removing variables one at a time beginning with those which contribute the least to the model. Table VII shows the steps and the seven variables which were removed. While each step will not be discussed, a few of the eliminated need to be mentioned.

The first variable removed from the model was the percentage change in employment. It was removed due to its high inter-correlation to employment change. Both variables essentially show the same information, therefore one is eliminated and the other receives the attention. Population change dropped out at step number two even though it had contributed to the regression model for all cities. Large cities would seem to be self-sustaining, minor changes in population would not greatly affect them. Another variable which was important to the model for all cities was the local tax rate per capita. This variable stayed in the large cities' model until the final step showing that it was more influential than variables which were removed earlier. The other variables were not considered to be important in either model; they apparently influence housing costs very little.

The overall summation of the regression models show that six variables were influential in determining housing costs. Tables VI and VIII show that the most influential variable was service industry employment. The variables wholesale and retail employment, 1986 population, and residential electric costs, were also important. The two final variables, local taxes per capita and

TABLE VII

BACKWARDS ELIMINATION STEPWISE REGRESSION
STEPS, LARGEST CITIES

Step	Variable Removed	R^2	Change in R^2
1	Percent Change in Employment	0.6554	-0.0005
2	Population Change	0.6542	-0.0012
3	Local Crime Rate	0.6507	-0.0035
4	Manufacturing Employment	0.6391	-0.0116
5	Population Density	0.6279	-0.0112
6	New Housing Units Authorized	0.6139	-0.0140
7	Local Taxes per Capita	0.6070	-0.0068

TABLE VIII

CONTRIBUTION OF VARIABLES ENTERED TO THE
REGRESSION MODEL, LARGEST CITIES

Variable	Parameter Estimate	Contribution to R^2	F	Prob>F
Employment Change	85.68	3.5	5.48	0.0225
Wholesale/Retail Employment	-320.90	13.5	20.66	0.0001
Service Industry Employment	370.53	19.5	29.77	0.0001
Population	-0.03	12.2	18.77	0.0001
Per Capita Income	3.10	2.9	4.53	0.0374
Residential Electric Costs	712.60	9.6	14.78	0.0003
Variation Explained:		61.2		

employment change contributed small, but significant amounts to both models.

If a model were to be produced for predicting housing costs, these six variables would all need to be examined very closely. Special attention would need to be paid to types of employment judging from the effects of employment in service and trade industries upon housing costs. While the change in employment was not found to be significant in this study, it is considered to be very important. Perhaps if a larger sample of cities had data published on this change, the variable would then have become more significant. Results from both the correlation and regression tests show that the makeup of local job markets is an important factor in explaining housing costs.

Differences between the smaller and larger cities were not apparent in the statistical analysis. In order to research this better, a larger sample of cities with populations over 500,000 or 1,000,000 would be required. The limitations of the data which were used in this study did not make good comparison between large and small cities possible. The only conclusion that could be made was that the larger cities seem to have more predictable housing costs than do smaller cities.

CHAPTER V

SUMMARY AND CONCLUSIONS

Summary

The objectives of this study, to show the level of geographic variability in housing costs throughout the United States and to try to explain this variability, have been completed. Housing costs do not occur uniformly over space nor are they stagnant over time. Price variation was shown by mapping regional areas of homogeneous housing costs in the contiguous United States and observing how these regions changed over an eight-year period of time. Through analyzing a series of maps, it was shown that housing costs were closely tied to regional economic conditions. Through statistical analysis these economic conditions were further broken down. The importance of employment patterns and changes in these patterns were found to be very influential.

The degree of regional variability of housing costs did not become apparent until after a series of maps was created. When completed, the maps showed large, homogeneous areas of similar housing costs. Due to the fact that housing costs occur regionally, instead of randomly, made the analysis possible. The first analysis consisted of a subjective interpretation of the patterns which the eight-year map series portrayed. An attempt was made at

explaining what had produced each of the different areas of homogeneous value. The economic conditions of the nation, such as the early 1980's recession, and the economic situation in different regions, such as the Southern Plains' oil boom and bust, appeared to be very influential.

A statistical analysis, performed upon the dependent variable, housing costs, was much more objective. The independent variables were selected based upon the map analysis and knowledge of variables found important in previous studies on housing costs. Studying all of the variables which are determinants of national housing cost variability would be beyond this or any study.

All of the statistical analyses supported the hypothesis that regional and economic conditions, especially in terms of job growth and types of employment, were very important in explaining housing cost variability. Recent, regional economic history explained much of the information that the assembled maps of housing cost variability portrayed.

Conclusions

This study has shown that analysis of the national housing market is possible. Although the scale is large to work with, more study is still needed. Many more questions appear to be raised by this study than were answered.

Even though home costs are high in parts of the United States, they are not at critical levels on the national scale. The results of the most recent Prudential Properties' Home Affordability Index indicate that affordability is a problem only in large, urban

markets. Ninety-seven of the ranked one hundred and fifty cities fell below the twenty-eight percent mortgage burden index, indicating that most areas, other than those along the West Coast and in the Northeast, have affordable home costs. Most of the cities that did fall into the high-cost categories support very large populations. Therefore, housing costs are a concern to a large number of people in a few select areas.

Perhaps the most important finding of this study was the discovery that the two high-cost housing regions, in the Northeast and along the West Coast, have never shown indications of leveling off during the past eight years. The primary reason for these increasing high costs is because of the continued migration of people into these two areas. Inmigration increases demand for housing and higher housing costs result. Until this uncontrolled migration into these areas is slowed, home prices will continue to rise.

High housing costs will not take care of themselves. Economically there should be some pinnacle that when reached should begin to decrease demand. But as long as people keep paying high home costs, costs will continue to rise. The most probable intervention to try and slow housing cost inflation will need to come from the federal government. Currently, national economic policies are developed for the entire country. However, it appears that there is more than just one economy operating in the United States, it appears to be a bi-coastal economy. Economic polices which the federal government develops need to consider that housing prices and economic structures are not uniform throughout

the country. Regional economic polices need to be developed in the future to compensate for this economic variability. One last type of governmental intervention could occur by trying to decrease demand for housing in these areas by slowing migration into the two economically active areas of the country. While this may be the only way to ease housing price inflation, it may infringe upon people's rights by telling them where they can and cannot live.

Much is still to be learned about housing market behavior at the national level. More statistical analysis should be done to explain the influence of other variables besides those examined in this study. Economic situations are very complex and there are many variables which could be studied independently, or in groups, to determine their influence. The different behavior of housing markets between different sized cities also needs to be further examined.

Analysis of homogeneous regions of housing costs such as those identified in this study need to be done. This would yield information on how the different homogeneous areas of average, low, and high costs behave. The information between these different types of regions could then be compared to see how they differ. Another possible way of studying these regions would be to study a particular region that has changed in extreme values over a period of time, such as with the case of the Southern Plains. One last approach would be to extensively examine the Southeastern United States region which has been an average-cost region throughout the past decade. This would provide information on how a stable market operates; the results may be of use in helping to

stabilize housing markets which are growing too quickly and need to be slowed down. Only through further analysis of housing costs will market behavior be better understood. The knowledge gained can be applied to help improve housing market behavior and make homes affordable to a larger number of households.

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APPENDIX

HOUSING COST DATA BY REPORTING CITY

1982 TO 1989

Data on housing costs which were used in this study came from the American Chamber of Commerce's publication, <u>The Inter-City Cost of Living Index</u>. The data came from the second quarter publications of each calendar year from 1982 to 1989. The following is a compiled list of these data.

	1982	1983	1984	1985	1986	1987	1988	1989
ALABAMA								
Anniston	58967		70600	60450	69100	76667	74100	
Bessemer	68925							
Birmingham	68000	70000	77000	80000	88000	88200	90500	97900
Decatur-Hartselle								93200
Dothan	67435	73300	76300	82500	85325	88250	90000	93000
Florence						74760	75000	81340
Gadsden	63000	62000	59000	61900		72750	70000	81000
Huntsville	77000	79785	80233	83433	87333	93600	110000	99000
Mobile	70225	72100	74225	75825	77075	81100	85167	86460
Montgomery		72250	72000	67500	68667	80167	90000	90000
Tuscaloosa		70000			70000			
ARIZONA								
Chandler							110000	
Phoenix	88357	79411	94630	94594	105314	98963	103402	101531
Scottsdale						121958		112867
Tempe							102208	101537
Tuscon			84375	89080	93700			111143
Yuma			73250	70450				
ARKANSAS								
Fayetteville	70000	73167		75000	79350	79083	82000	80000
Fort Smith		69625		72080	81000	81500	74900	76390
Jonesboro	70533	70900	70567	70333	70167	70933	71333	77333
Little Rock	79200	86900						
Pine Bluff					65300			
CALIFORNIA								
Anaheim	121509	100830						
Bakersfield	94150	107125	105610			108456		94257
Chico				117000	94000			
Fresno	88454	85167		86650	88300	104000	95500	106267
Los Angeles					120682			
Merced County					91250	81462	86750	108670

	1982	1983	1984	1985	1986	1987	1988	1989
CALIFORNIA (cont)								
Modesto	89000	92900						
Orange County					139440			
Palm Springs	117500	110000	109000	140600	136000	136000	126550	142900
Riverside City	85000	86000	86000	110500	121515	121515	117750	126300
Sacramento	84808	85870	94280	97960	94100	93800	95100	118500
San Bernadino				84437	96000			
San Diego	115250	117500	126750	132500	136400	151000	159000	195000
San Francisco			127300	181300				
San Jose	121035	120358	129500	124950	129000		172000	
Visalia		82593	86620	86500	96300	98000	108600	102140

	1982	1983	1984	1985	1986	1987	1988	1989
COLORADO								
Boulder			118000	119700	116948	118575	115640	118371
Colorado Springs	75383	77920	81240	81458		79924	86880	90300
Denver	112475	116250	124725	119250	112870	108800	124069	120143
Fort Collins		81000	84000	84000	80000	80000	100986	103113
Grand Junction	90000	76560			68571	71280	71790	74940
Greeley				97000				
Longmont						84975	82750	93347	97000
Loveland						77640		77467
Pueblo	69849	64510	62048	61120	64420		67300	71980

	1982	1983	1984	1985	1986	1987	1988	1989
CONNECTICUT								
Hartford					99840	113780	116460	149100	173620
Meriden								156333
New Haven				91800				
Stamford		136125						
Waterbury		75480				175483		

	1982	1983	1984	1985	1986	1987	1988	1989
DELEWARE								
Wilmington					116333	109033	141833	137224

	1982	1983	1984	1985	1986	1987	1988	1989
DISTRICT OF COLUMBIA								
Washington D C		122412						

	1982	1983	1984	1985	1986	1987	1988	1989
FLORIDA								
Boca Raton	129762	101223	145086	122756				
Bradenton						97500	97533	
Fort Lauderdale	93767		91090		109450			
Fort Myers						80000	88900	
Gainsville	81000			86400	88990			89962
Jacksonville		83940		92440		89750		91920
Lakeland	60000	72000	71750	76000	71800	88260		93800
Miami	74775	82333	87500				103148	106742
Ocala	60550							
Orlando	74050						101340	97800
Pensacola		72000	75600	79200	88350	87880	85500	86880
Sarasota				87388		92850	98000	
Tallahassee	88908	83500	74000	79000	80800			
West Palm Beach	88667	91300	88000		118400	120053	100382	116250

	1982	1983	1984	1985	1986	1987	1988	1989
GEORGIA								
Albany	78750			79650	79500	80000		87400
Athens	72000	71600		73260				
Atlanta	81057	86054	85667	102666	109949	119800	112068	103473
Augusta	75007	79550	81200	88415	95856	90300	99460	94112
Columbus	73084	70750	75667	86500	83833	91331		89301
Macon	76560	76480	77560	82380	74460	84340	84580	92160
Savannah							92500	85560

	1982	1983	1984	1985	1986	1987	1988	1989
IDAHO								
Boise	67000				89967	88767	93833	97820
Pocatello							72500	72000
Twin Falls				82833	69939		74000	75375
ILLINOIS								
Bloomington					88460			
Champaign-Urbana	79500	80000	73517			100667	104667	112167
Decatur	64967	65333	65800	68475	78750	78175	82500	82000
Freeport							103725	99020
Kankakee	68900							
Naperville						115067	167600	175790
Peoria	75000	63375	62500	65500		98500	111750	
Quad Cities					80500	82800	89240	85830
Quincy						77260	94867	
Rockford	74940	68700	72598	84657	81886	90000	96740	94805
Schraumburg						148631	152287	
Springfield	65233	69220	69400	93600	90000	85900	95000	106600
INDIANA								
Anderson	85200	80850	72400	78000	80000	80700	81000	99000
Bloomington	66740	64360	69540	68113	69990	77123		89510
Evansville				79200			98879	90006
Fort Wayne	68850	62000	73000	74000	77400		91700	91022
Indianapolis	78300	81900	85700	82150	83790	85759	89248	96859
Kokomo						88500	93500	
Marion	77667				87875	81400	86333	
Muncie	64600	65433	73870				85670	103772
S. Bend-Mish.	65000	66420	65900	71640	72840	77640	84921	87015
Terre Haute								96560
IOWA								
Ames					120000	106933	110000	105800
Cedar Rapids	93800	93800	90833	95333	82700	97760	116600	102909
Clinton						72000	90000	
Council Bluffs					72667	72667		
Des Moines			99060	106333	107375	106250		
Dubuque	72500	77900	75240					96400
Fort Dodge	70000	65000	65000	70000	70000	90000	90000	99000
Iowa City	76900	79460			122500	105000		
Marshalltown	73000	70667	76667	71500	69333	67500		
Mason City			85873	89266	89018	85986	87000	103167
Sioux City	68988	73250	73600	76100	75900			
Waterloo-C. Falls								117125
KANSAS								
Hutchison	84600	82500						
Kansas City	86083	92125	83020					
Lawrence		71000				89533	102760	100982
Manhattan	71750	69000	81500	78000	75975			
Salina					81780	78800	78800	82000
Wichita	82071	98175	90000		73325	79000	82857	97520
KENTUCKY								
Ashland	55750	57600						
Bowling Green	58530	66300	77000	74833	83333		81600	84500
Lexington	74173	82489	84708	89892	86786	99098	102038	103993
Lousiville	68600	74800	69200	72500	73600	81500	84320	87142
Owensboro	55167		81600			87500	86000	
Paducah								88645

	1982	1983	1984	1985	1986	1987	1988	1989
LOUISIANA								
Alexandria	74820	72150	72400		80000			
Baton Rouge	85000	86000	86750	86400	89540	89660		
Lafayette	91800	89200	95500	92100	77900	72360	72040	
Lake Charles	83200	90000	82667	79500		82667	77560	82140
Monroe		68875	89703	78900	80000	75181		84950
New Orleans		86667	88825	82250	84265	86200	90540	93600
Shreveport	103033	100833	107000		93167			
MAINE								
Lewiston				93568	69025	72380		
MARYLAND								
Baltimore	88475	81850	94375	90600	96400		100600	124338
Hagerstown								143000
MASSACHUSETTS								
Boston						225000	322500	
Fall River				92252				
Fitchburg-Leomin.		69300			134950	171667	163333	
New Bedford	82500	73875						
Springfield							163280	183000
Worcester		90500		116100			176529	172911
Westfield		90800						
MICHIGAN								
Flint	84200	83900	86400					
Holland	71042							
Jackson	86683	68767	67362	67900	73250	75447	93706	125000
Kalamazoo			89333	89989	91700			
Lansing	90000	90000	90000	90000	90000	90000	107618	
Midland	81000							
Royal Oak				78200				
Saginaw	78000							
MINNESOTA								
Duluth	65000	54500	55700	55000				
Minneapolis	91300	107930						108520
Moorhead								92972
Rochester	73500	73458	74875	82373			81640	86383
St Cloud			71351	69537	74924	76067	78300	82039
St Paul			90352	99481	94125	96960	98480	
MISSISSIPPI								
Gulfport					82140	68000	72500	72500
Hattiesburg	74667	67060	73200					
Meridien		73600						
MISSOURI								
Columbia	70800	71050	76880	78740	77600	79540	87900	85917
Jefferson City	75500	75800	83000	83000	90000	90000		90000
Joplin	64500	53500	80280	78380	80280	80000	78400	
Kansas City	85800	83200	88000	79660		89220	87460	90180
Springfield	66600	69272	66620					
St Joseph	79250	81000	84600	74400	86400			
St. Louis	79960	85420	84530	83440	82910	85030	87970	96530
MONTANA								
Billings	91380	112080	111300	103250	110700	91390		
Great Falls	75000	75000	73000	73000	72000	75000	70000	
Missoula			55000	65000	63500	74687	68500	88500

	1982	1983	1984	1985	1986	1987	1988	1989
NEBRASKA								
Grand Island							70950	76160
Lincoln	82500	80000	85000	86100	85100	87400	87300	88200
Omaha	72000	71333	77667	77250	80000	80300	85125	87290
NEVADA								
Carson City								116128
Las Vegas	96333	95500	87010	92852		102090		
Reno-Sparks	86500	102941	101100	99033	100225	106980	112490	111380
NEW HAMPSHIRE								
Manchester						176960	184000	174500
NEW JERSEY								
Newark-Elizabeth	85525	87800	104600	116600	121750	143250		
NEW MEXICO								
Albuquerque	85430	90000		92574	103725	109925	103280	107658
Clovis						81750		
Farmington						93025	93500	101500
Hobbs							61902	89557
Las Cruces		80000				99090	93964	98940
Roswell				87867	84250	84020		82950
Santa Fe								133790
NEW YORK								
Albany					84000	117500		109662
Binghampton	67834	64450	85000	85167	82500	89267	106360	102450
Buffalo	66433	68788	74262	66575	65271	71662	80020	118956
Elmira	69625	53250	63000	68433	76900	79140		128890
New York	91200	86900	104200	123800	131580	170000	223800	
Rome	68575							
Syracuse	60250	62000	60477	67800	70000	70800	75400	89600
NORTH CAROLINA								
Asheville			76850	84800				
Burlington	85000	85000	85000					
Chapel Hill		88650	96250	106000	110692	132717	137500	123820
Charlotte	78000	77500	83500	88000	90800	96200	105200	110700
Durham			80000	85133	92450	91200	109633	114420
Fayetteville						96750		89880
Gastonia							91500	101700
Goldsboro							95167	
Greensboro	84467	83340	83567	90825	85200	95688	101688	104967
Greenville	72500	70000	80000	80000	84700	94400		96000
High Point					97000	111133		
Raleigh		89500	97540	105950	115780	105140	106610	110140
Rocky Mount	58475				85360	84740	98685	96340
Wilmington		79050	85596		90724	98935	105330	108215
Winston-Salem	77500	79900		88088	95450	106167	110333	101475
NORTH DAKOTA								
Fargo								121200
OHIO								
Akron			66413	72725	75750	79875	80975	86200
Canton		73333	79667	77367	80833	81000	91333	89833
Cincinatti	84000	82000	84000	82800	85650	86270	93120	103538
Cleveland			81000	81000	81000	81000	89460	123780
Columbus	74160	84980	89280	87100	82200	92220	106262	110360
Dayton	77800	77304	77250				94967	115625
Findlay						96250	97250	101400

	1982	1983	1984	1985	1986	1987	1988	1989
OHIO (cont)								
Hamilton		66500						
Lancaster		71788	84450					
Lima					82750	76050		
Lorain				85967	87800	86667	88750	
Mansfield							94433	99600
Newark	81833	82666	81000	88600		74600	79000	80790
Springfield		81410						
Toledo							98000	125600
Youngstown	81500	81500	83500	85000	85000	84000	85500	89500
OKLAHOMA								
Lawton	81000							
Norman	89333	97560	86000	86612				
Oklahoma City	79950	81600	83320	76400	76600	73140	77700	88570
Stillwater	80810	85000						
Tulsa	85060	87700	89705	86456				72841
OREGON								
Corvallis	94125							
Eugene						93400	98679	109275
Medford				79833	82588			
Portland	87000	90500		82540	99400	95940	95940	
Salem			69000	65460	73000	78000	84000	91800
PENNSYLVANIA								
Allentown	64000		68000					
Altoona	67600	66000	71200	75150	73500	72850	72850	
Easton	65000							
Erie		63000	88000	70000	83640	85500	90480	119000
Harrisburg	84870	81404	80585	80048	80173	82756	86438	118038
Hazelton					66500	94189		
Lancaster			81625	70630	85475	79250	81600	87800
Lebanon						89000		
Philadelphia				89500	96500	108375	119900	138600
Pittsburgh			82500		79000			103444
Reading	75000	80000	80000	81500				
Scranton				67000				
Wilkes-Barre	57225	77500	77000			72533	80850	81133	103762
Williamsport		83575						
York	82000	84000	88000	91000	91000	95600	87333	90217
RHODE ISLAND								
Newport		89600	85960		99600			
SOUTH CAROLINA								
Anderson							87800	
Charleston	80000	69000					91480	
Columbia			80670	83450		88076	87200	98000
Florence		68433				90167	92000	94600
Greenville	72500	84500		82680	86000	87000	89600	99600
Spartenburg				85860		80400	90020	88980
SOUTH DAKOTA								
Aberdeen			71333	74825	78875	76875	70433	72100
Rapid City	64600	69467	63333	66267	67900	77767	89850	89850
Sioux Falls			80667					

	1982	1983	1984	1985	1986	1987	1988	1989
TENNESSEE								
Chatanooga	67480	64440	67550	69230	69862	76970	87904	84310
Cleveland			71680			85740		91640
Jackson	65000	65000	67500	68500	69500	73800	77000	79400
Kingsport					65671	80000	86000	106300
Knoxville	69320	66167	72433	69960		78725	86817	89943
Memphis	77321		86562	88406	85000	89900	89819	91741
Murfreesboro						79875	89780	94060
Nashville	73200	76100	82500	85950	92850	102550		
TEXAS								
Abilene	87038	84300	82000	80400	83420	83900	83100	79720
Amarillo	69570	72290	85660	93100	88100	81200	79280	82080
Arlington	76410							
Austin			96390	106580	104159	96746		81060
Beaumont		88000				75000	75375	71980
Brownsville					78400	73860	69125	71125
Corpus Christi	83375	89567	88200				86583	81800
Dallas					97686	97237	92703	95489
Denton							95040	
El Paso	80325	78250	86500		70210	94000	94600	90867
Fort Worth	75000	83000	83000	85000		79000		
Grand Prarie	89200							
Harlingen	82063	89075	81400	84850	81000	79867	72450	74560
Houston	87617	88000	94660	90350	71981	72251	73696	81228
Irving					129800			
Killen	65900	66325		76033	78333	85710		75000
Longview								81000
Lubbok	57315	67680	81500	80250	71850	71520	78300	80010
Lufkin						75000	71500	79740
McAllen	95075	84550	83980	82500	84480	88750	90337	87767
Midland	99000				90000		74433	85832
Nacogdoches	69462	79970	87400	83300		82167	77667	
Odessa	95965	100200	89345	84000	79600	74200	77450	84600
Pasadena		89680	87600					
Plano	98057	104179						
Port Arthur	75000			83000				
San Antonio	78625	86940	90000	86714	88317	85760	90000	85990
Sherman	67500	75600	82000	88200	93600	85500	85500	85000
Temple	77833	80150	77867	77767	78183	77117		
Texarkana	72600	73500	75333	80300		77500	80667	84000
Tyler	72000	78750	81000	81500	77000	72500	74500	75000
Victoria		89167	90400	93500	90300	90533		
Waco	79600		68667	73580	77000	76900	77062	77580
Wichita Falls	76320	79200	82240	85680	89820	85620	78660	
UTAH								
Provo-Orem	68910		75900				79923	78500
Salt Lake City	80165	82100	80000	83600	82655	88150	85067	84694
VERMONT								
Burlington	82800	79900						
VIRGINIA								
Lynchburg	76985							
Norfolk	81100	80000	88500	87676	88690	93975	93350	108150
Richmond			77200	84800	93280	90300	108140	104600
Roanoke	84800	89750	92174	85590	85770	98250	94912	108750

	1982	1983	1984	1985	1986	1987	1988	1989
WASHINGTON								
Olympia							82120	87900
Renton			85000	100000	93725	90000	95000	110000
Richland-Ken.	71000	64667	64000	68500	71000	73106	77233	74500
Seattle				89000	90600	97000		112198
Spokane			81000	88344	86768	87829		90965
Tacoma	82550	85228	87000	94950	92149	92160	91000	95000
Walla Walla						85833	91667	86875
Yakima	72250	82550	85025	85950	88950	88975	89150	91000
WEST VIRGINIA								
Charleston	85552	84500	86250	84328	89000	75833	81417	88976
Huntington	78000	88000	89000			77333	77333	77500
WISCONSIN								
Appleton	83333	80500	85250	91625	91000	90500	91875	
Beloit					73725			
Eau Claire	82000							
Fon Du Lac	85263	85167	93100	92500	100000	86466	92553	102400
Green Bay	75000	75000	84938	85750	89438	88750	89667	89138
Janesville	71120	74430	72680	73880	74375	74382	89467	94167
Kenosha								122000
La Crosse	79900	84400	75667	82225	81250	76760	81000	83500
Madison	100500							
Manitowoc					91125	87000	93333	91667
Oshkosh	87300	84666	90667	95333	109000	109000		107500
Sheboygan	71900							
Wausau	99250	90000	69100	71500	77750	89000		121667
WYOMING								
Casper		84833	64333	74267	67533	69500	80000	73250

VITA

Kent S. Schreiner

Candidate for the Degree of

Master of Science

Thesis: A GEOGRAPHICAL ANALYSIS OF HOUSING COST VARIATION IN THE UNITED STATES, 1982-1989.

Major Field: Geography

Biographical:

Personal Data: Born in Nebraska City, Nebraska, July 6, 1966, the son of Thomas J. and Joyce A. Schreiner.

Education: Graduated from Lourdes Central High School, Nebraska City, Nebraska, in May, 1984; received Bachelor of Science Degree in Geography from Northwest Missouri State University in May, 1988; completed requirements for the Master of Science Degree at Oklahoma State University in July, 1990.

Professional Experience: Teaching Assistant, Department of Geography, Oklahoma State University, August, 1988, to May, 1990.

Professional Organizations: The Association of American Geographers, Gamma Theta Upsilon.