CAUSES OF DIFFERENT GROWTH RATES BETWEEN SOUTH CAROLINA AND NORTH CAROLINA

by

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FOREWORD

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CAUSES OF DIFFERENT GROWTH RATES BETWEEN SOUTH CAROLINA AND NORTH CAROLINA

INTRODUCTION

Several factors influence human existence and growth. The first is geography; i.e., climate, the physical environment and natural resources. Culture is the next chronological variable for establishment of a permanent social order. People achieve knowledge, subsistence and ability to convert natural resources into food, clothing and shelter. Information and practical skills are transmitted from one generation to the next via language. Written documents facilitate historical records. Education, economic and political institutions are then established, expanded, acculturated, and become part of rather permanent organizational structures.

Scholars identify all these phenomena as essential for understanding the human condition and change. They are, nevertheless, difficult to quantify. In the research reported here, we recognize that these intangibles are important and will continue to influence population characteristics and change in both South and North Carolina. It is worthwhile to note that culture and history of the two states are similar. Human institutions are dynamic and changing even as we review and analyze population change. The approach is, consequently, *Demographic*. All relevant data has been collected and processed. Our research design is based on current and recommended social science theory and methods.

Economic and social conditions are dependent on numbers of persons and on many characteristics of aggregate populations. Concern is, of course, directed to geopolitical entities; i.e., geography having permanent administrative boundaries. Research reported in this manuscript is focused on the states of North Carolina and South Carolina, and counties within the two states.

Inhabitant numbers in these entities shall be specified. Such inhabitants reside in the respective areas, pay taxes, consume private sector goods and services, and expect at least a minimum of public sector services. These functions, primarily institutional, are associated with land use, land use change, banking, finance, real estate development and a myriad of economic and social variables. The residential function and housing shall be

emphasized. Our literature review is comprehensive. Concepts, principles and theory from social science, including real estate markets and housing demography are presented in the next chapter.

Returning to inhabitants, the chief concern is *change*; e.g., numerical and percent increase; and in some cases, numerical and percent decline. Public and private sector organizations respond to population changes by estimating consumers, assessing their delivery systems, marketing products or services, establishing sites for their business/office/service, and establishing networks with suppliers or others having similar interests. It is essential to know if changes differ from one geopolitical entity to another.

Each relevant geographic area must be delineated. A state, for example, comprised of individuals, and over time, may increase, decrease or remain the same. Some were added to the population and some were subtracted. These dynamics refer to basic components of population: *births, deaths and residential relocation*, and may also be termed fertility, mortality and net migration. Migration/residential relocation certainly is a major construct for the real estate industry.

People move to and from cities, counties, states, regions and nations. Although each has unique fertility and mortality rates, net migration tends to be a more "popular" variable. Nevertheless, all three of these demographic phenomena work simultaneously, and many behavioral implications of these combinations have decisive consequences for age distributions. Geographic distribution of population is important and is affected by both fertility and mortality. Residence categories **C** rural and urban populations **C** must be considered. Persons per square mile and size of place are useful geographic and demographic criteria, as well.

Although the academic base for the research reported here is demography, this speciality relies on several disciplines for theoretical foci. These disciplines, in alphabetical order are: business administration, economics, finance, geography, housing, land economics, planning, political science, real estate and sociology. Theory and literature from the body of knowledge guided selection of dependent and independent variables. Dependent variables

for this research are: percent change in population 1990-2002, percent change in housing units 1990-2002, percent change in households 1990-2002, and percent change in families 1990-2002. Selection of independent variables are based on the literature with particular attention to characteristics of the two respective states. Data were collected and processed for more than 1,800 prospective independent variables. Statistical analyses will determine which are most significant in explaining change in inhabitants, housing units, households, and families for South Carolina and North Carolina.

Demographic forecasts Population numbers for 1997 and 2002 are used in this research. This range was selected for three reasons. First, forecasts for those years, formulated by scientific methods and procedures which are recommended in the discipline, are available. Forecasts of population numbers may be obtained for the years following 2002, but confidence levels decline dramatically. Third, optimum social and economic characteristics were available, beginning late 1980's, which enhance research design and statistical procedures. In this report, the source for most of our pre-1997 information is from the United States Department of Commerce. Third Wave Research Group, Ltd. is the source of 1997 and 2002 forecasts.

One objective of this research is to note implications for regions, counties and communities in South Carolina and North Carolina. Consequently, *county-level* data were retrieved and processed for both states. This procedure, recommended in social science research literature, facilitates precise statistical analysis. Statistical procedures and abbreviations are presented in Appendix A. Definitions of relevant variables are provided in Appendix B. South Carolina and North Carolina counties are listed in Appendix C. Dependent and independent variables used in regression models are indicated in Appendix D. A list of all variables retrieved and standardized are in Appendix E.

Information about demographic change in the two states is presented in Table A. Growth rates for North Carolina exceed those for South Carolina in all categories. Rates of growth are substantial in both states for per capita

income. Change data, all variables, for South Carolina are encouraging. This is particularly true for the income variables. Percent change in housing units is higher in North Carolina because of declining birth rates and net in-migration. Similar per capita income change results from a higher proportion of non-household wage earners in South Carolina and from higher proportions of young and elder households in North Carolina.

Table A

North Carolina and South Carolina,
Six Social and Economic Indicators, 1990-2002

	North Carolina	South Carolina
Percent Change in Population	17.9	14.0
Percent Change in Families	16.2	13.1
Percent Change in Households	15.8	13.4
Percent Change in Housing Units	18.9	15.4
Percent Change in Per Capita Income	18.7	18.5
Percent Change in Median Household Income	17.2	15.9

REVIEW OF LITERATURE

In this section the terms population and inhabitants are used and have the same meaning. The review of literature for this inquiry will initially focus on literature concerned with population change, growth and characteristics. These references are relevant for economic development and the real estate industry. Charles B. Nam (1994) wrote a demography text which is titled *Understanding Population Change*. The author reviews history, culture and institutions, and emphasizes components of population change; i.e., births, deaths and migration. He indicated that an essential construct for understanding population change is the "Balancing Equation"

$$P_{t2} = P_{t1} + B - D + IM - OM$$

where

P_{t2} = population time 2, P_{t1} = population time 1,

B = births, D = deaths,

IM = in-migrants, OM = out-migrants.

Entries are simplified by using natural increase or decrease (births minus deaths) and net migration (in-migration minus out-migration). The equation facilitates solving for any one missing component. The author then explains how population change is influenced by each vital statistic group: i.e., births, deaths, marriages, and divorces/annulments. Population composition variables are then reviewed **C** sex, age distribution, and racial and ethnic characteristics. Residential relocation, geography and inhabitable territory are on his list of variables influencing change. Geographic distribution of inhabitants, number of persons per square mile, size of place, and residence categories (metropolitan, nonmetropolitan, urban and rural) are important considerations. Nam then analyzes institutions emphasizing family and household composition, education and economic systems. Under economic systems, he includes labor force, occupation, employment, unemployment, underemployment, income and poverty. These are important macro factors affecting change and, when detailed characteristics are analyzed, become determinants of quality of life, economic

development and population change and growth, employment, occupations and income. Professor Nam, along with other authors reviewed here, discuss the writing of Thomas R. Malthus, a nineteenth century economist. Malthusian theory contends that population numbers will exceed the natural resources and ability of a population to provide subsistence, particularly food. Knowledge, science and technology have since called into question the inevitability of this process.

The United Nations has contributed to demographic literature for the past half-century. Although this organization has an international focus, many topics and findings are relevant for any nation, state or region within a state. A United Nations (1993) publication on determinants of and consequences of population change, notes all of the variables which Nam reviewed and also suggests additional topics. Selection of variables is, in part, based on economic indicators of problems which can stymie development and change. Analyses of economic fields include sections on economic base and industrial categories, savings, investments, employment and productivity. These are important variable headings for the research reported in this manuscript.

Demographic research by the United Nations has been used for applied inquiries in many nations, including the United States. Agostini and Richardson (1997) used a United Nations Development Program, Human Development Index (HDI), to formulate a refined index for the 25 largest cities in this country. The HDI comprises *Health Indicators*: life expectancy, child mortality and maternal mortality, *Education Indicators:* mean years of schooling, drop-out rates of all 16-19 year olds, and educational attainment of percent persons 25 years of age and over, *Income Indicators:* real per capita income, distribution adjusted real per capita income, and percent households below the poverty level. The authors were pleased with their index results for the 25 largest U.S. cities and recommend that it be replicated, following each installment of new data for those and additional citi

The next reference provides a demographic review of the southeast, in this case: Alabama, Florida, Georgia, Mississippi, North Carolina and South Carolina. Harold Hodgkinson (1993) analyzed 36 variables, under three topic

headings. His topics and variable headings were economic infrastructure, urban population, labor force composition, per capita personal income and sources of income. Social infrastructure included percent of births to teen mothers, AIDS cases per capita, percent persons in poverty and percent children in poverty. Human resources included percent of population without health insurance, Head Start enrollees, per-pupil expenditure on public education, and percent population 25 years of age and over who have completed high school. North Carolina ranked higher on these variables than does South Carolina.

Research conducted at Cornell University also contributes to the body of knowledge on this topic. Paul Eberts and Amanda Hart (1998) examined the economic and political viability of metropolitan and nonmetropolitan counties in New York State. Per capita public and private funds for family services, vocational training, and employment of females and minorities, and participation rates in these programs were nearly identical in the two residence categories. Nevertheless, income and population growth resulting from these programs were greater in metropolitan counties. Income and population growth were dependent variables and more than 100 independent variables are considered. Factor analysis, correlations and results from regression models enabled the authors to conclude that the metro/nonmetro residence categories continue to be the most definitive independent variables. Eberts and Hart suggested that inertia is, in part, responsible. Metropolitan areas expect to grow and do so; but non-metropolitan inhabitants are wary about change. Human capital, social and economic infrastructure and political experience contribute to quality of life in metropolitan areas.

Literature about economic development and growth will be discussed. A good place to start is with a business demography text. Louis Pol (1987) wrote such a book, subtitled: *A Guide for Business Marketers and Planners*. Four chapters are provided on topics which continue to be authoritative references. He recommends multivariate analysis methodology to determine significant independent variables for diverse geographic areas. Guidelines appear in three separate chapters about demographic research for small, large and international

businesses, respectively. His systematic discussion of housing units, household size and one-person households facilitate outlines for research design and selection of variables. Professor Pol believes that households are basic consumer units and that housing characteristics are definitive variables.

Ansley J. Coale (1976) edited a classic book on economic factors in population growth. This reference has a global focus and includes authors who present empirical evidence and implications for urbanized and industrialized nations, including Canada and the United States. Many of the demographic and economic variables listed in the above references are included in the Coale book. Additional articles, contributed by prominent authors, are certainly relevant for population growth in North Carolina and South Carolina. Urbanization and growth, maintaining employment, residential relocation to and from our states and residential relocation within our states are among the topics investigated. Multivariate statistical procedures were used in several articles.

Phillip Musgrove and Adele Shapanka (1982) published a monograph originating from Resources for the Future, Inc. research thrusts. Their inquiry asked the question, how might different courses of population growth affect the structure of final demand in the United States economy? Projections of household numbers, household composition, age distribution, household income, and labor force participation rates were calculated. Demand for housing was based on age, size of household, employment, per capita income, discretionary income, motor vehicles, other transportation and per capita expenditures. Their final demand equation included the following effects: income, age, household composition, education, inflation and health. This research constitutes an original contribution because it embraces a research design using multivariate statistical procedures, fundamental demographic characteristics, institutional variables, and projections. This study was conducted during the early 1970s.

The next reference is private-sector based and investigates growth potentials for the state of South Carolina. Problem Solving Research, Inc. (1998) of Greenville, North Carolina, recently published an Outlook South Carolina report. This manuscript provides information for the United States, South Carolina, and each county in the state.

Variables used in this research are: inhabitants, employment, unemployment, percent crowded dwelling units, per capita income and retail sales. Problem Solving concludes that future employment and retail sales growth rates for South Carolina will be greater than for the United States.

The following two references are concerned with economic development and growth from one of our study states, North Carolina. Kenneth Wink and Steven Ellers (1998) conducted an empirical assessment of public expenditures on income growth in North Carolina counties. Their expenditure categories were education, economic development and physical development. It is hypothesized that federal and state expenditures in urban counties will accelerate economic growth in these counties. The authors noted that, historically, total per capita public expenditures are greater in urban than in rural counties. It is suggested that, in addition to urbanization, per capita expenditures for public education and per capita economic and physical development spending (substantial funding, both categories, from state government) are more likely to result in population growth and income growth in urban counties than in rural counties of North Carolina. Wink and Ellers used multivariate statistical procedures in their researc

Mitch Renkow (1996) provided another inquiry about North Carolina, specifically earnings differentials between rural and urban counties. The author noted that disparity in economic performance of rural and urban areas had widened after 1970. He hypothesized that 20 independent variables, could, in part, be responsible for lack of economic growth and the decline in rural population. Econometric results indicate that educational attainment, unemployment shocks (both transitory and permanent), percent elderly inhabitants and percent non-white population all contribute to lower rates of economic growth in rural areas. Education was the strongest causal variable which suggests that returns to schooling are larger in urban areas. Renkow recognized, nevertheless, that many young, educated persons move from rural to urban areas, following completion of their junior or senior year of secondary school.

The following references are concerned with development, with emphasis on real estate markets. James E. Frank (1989) contributed a succinct review of literature on the public and private costs of alternative development plans. His commentary and interpretations are applicable to most real estate market categories. The author is pro-growth and recommends that *public* costs be minimized. Literature and data are presented for costs of grading, other transportation facilities, water systems, sewerage, drainage, schools, trash and garbage. Capital costs are discussed, including initial investments, overhead, maintenance, unanticipated expenditures and inherited costs following down-sized or abandoned entities. Frank also discussed density issues. In the short-term, centralized concentrations are usually cost effective for both public and private sectors. The author also pointed to evidence that, in the long term, density is subject to externalities from natural disasters, sewerage, waste disposal, crime, and other economic, social, and environmental problems.

A study of land use change for real estate development was conducted by Thomas Donnelly, F. Stuart Chapin and Shirley Weiss, (1964) at the University of North Carolina, Chapel Hill. This classic study, based in Greensboro, produced a probabilistic model for residential growth. Greensboro adopted a land use plan in 1943, which guided post World War II land-use change and development. The research is noteworthy for several reasons, particularly for implementing a multi-disciplinary research design, quantifying land use and change in land use, and introducing population density as an independent variable. Additional variables are: land use characteristics prior to and following development, residential/non-residential characteristics, specific business use categories, availability of public sewerage, and attraction index based on accessability to work areas, nearest elementary school and nearest unit of a major street system. This research helped set the stage for subsequent basic and applied inquiri

James R. Cooper and Karl L. Guntermann (1974) edited a real estate and urban land analysis book which is an important reference on this subject. Works by 29 authors and nine public agencies or private companies were included. Topic headings are: urban growth, urban structure, urban problems, legal environment of urban space use,

housing, urban development, valuation and investment analysis and large-scale real estate development. Specific topics are suitable for readers of several disciplines and about half of the articles provide empirical research and/or data based evidence. All categories of urban land use are discussed and roles of federal, state and local policies and regulations explained. The articles about economic factors and variables are particularly useful. Natural resource and environmental quality assessments are suggested. Several authors analyzed data for states and utilized multivariate analysis in their research.

The following references have direct relevance for real estate markets. Dean Schwanke is Director of Information Services for the Urban Land Institute. Schwanke (1995) authored an article about real estate market perspectives. He reviewed global, national and regional economic and market conditions and describes real estate construction, sales and rental trends for the early and mid-1990s. Twenty-five real estate market sectors are discussed in this data-rich manuscript. Schwanke provided estimates for the late 1990s market sector and is most optimistic about office/suburban, industrial/warehouse, and rental apartments. His optimism about retail markets is limited to power center shopping centers. He is least optimistic about single family houses/resort, regional mall/shopping centers, and office/downtown markets. The author emphasized that knowledge about regional and local conditions are essential. Sixteen metropolitan regions are listed which experienced downward momentum shifts in rents and sales during the early nineties. Schwanke reiterated the importance of global and national policies, particularly the Federal Reserve System and capital markets.

G. V. Barrett and J. P. Blair (1988) wrote a book about conducting and analyzing real estate market and feasibility studies. Their comprehensive and systematic text includes land development, three real estate market categories, cash flow models, feasibility reports for lenders, economic and social influences, and case studies of industrial park, shopping center, office space and residential developments. Their sections on demographic research include most of the variables recommended by Nam (1994), Pol (1987) and others. Emphasis is placed on land use,

consumption, finance and monetary variables. Most of the research reported by the authors utilized multivariate analysis.

Barrett and Blair (1988) also discuss the ecological concept of *filtering*. This term originated in the 1920s when geographers described urban spatial dynamics as a moving outward of interior land uses. Filtering was subsequently observed as the movement of upper-middle income households to the periphery along transportation routes. Lower income households follow residential paths established by higher socioeconomic groups. Residential transition is seen as the movement of lower income households into areas which were previously inhabited by the next-higher-income category. This process is recognized as a human ecological function wherein housing is made available to lower income families. Modifications occur in dwelling units per structure, as well. Dividing existing structure into multi-family units and lowering per unit maintenance expenditures provide lower rents without decreasing profits. Barrett and Blair also used a novel approach to emphasize the importance of collecting and analyzing variables from several social science disciplines. Eight *myths* are stated, heard on the street or in the popular press, which the authors prove to be false.

Mitchell and Myers (1993) collaborated on guidelines for real estate market analyses in an article for *The Appraisal Journal*. The authors recommend a model which includes four constructs: demographic characteristics; housing, retail and office space demand; capture rate for each; and project absorption. The four constructs are additive and in logical sequence. Specific demographic variables are: inhabitants by age and sex, employment by age and sex, and change in employment growth by each industrial category. These data are used to formulate housing, retail and office demand forecasts. Capture rates are calculated by estimating competing supply ratios and competitiveness of proposed projects. The authors suggest that *county* is an appropriate geographic unit, albeit *trade area*. The type and magnitude of each respective market analysis may, nevertheless, dictate other geographic units.

The following references are relevant for real estate *housing* markets. Michael Potepan (1996) published an article in which he explains why housing prices, rents and land prices vary between metropolitan areas. Data for 58 separate metropolitan statistical areas were processed and analyzed. His independent variables included: household income, household numbers, increase in households, non-housing prices, quality of public services and two regulatory variables **C** topographical and legal land use constraints. The author concluded that household income differences have the strongest influence on metropolitan price variations. Findings from Potepan's regression analysis suggested that increase in

households and non-housing prices have statistically significant but weaker (than income) impacts on housing prices, rents and land prices.

Dowell Myers (1992) published a reference/text for using census data. The subtitle of this popular book is: *Portraits of Change*. The author discusses the importance of housing data for real estate analysts and notes that average household size is a base statistic. He introduces a Housing-Based Model to predict owner and rental housing units. This descriptive model can be used for projected housing needs, if reliable inhabitant forecasts are available. First, population projections are obtained and estimates of births, deaths, and migration are calculated. Second, current labor force participation rates are applied to each age-sex group to predict the future number of workers. Then, future population is converted to future housing needs by applying household headship rates to each age-sex category. The resulting number of households headed by each sub-group is multiplied by the current home ownership rate for each group. These statistical products provide forecasts for numbers of owners and renters. Myers, in his examples of housing based economic research, uses most of the available Census of Housing variables. He also recommends numerous input variables, particularly vital statistics, residential mobility, sex, age, race, family and household composition, educational attainment, labor force, occupation, employment, income, poverty, public

assistance and other census indicators.

Dowell Myers (1990) was one of the first housing demographers, per se, and published a book titled *Housing Demography*. Myers contributes several chapters as sole author or co-author. Disciplines represented include: demography, economics, geography, political science, real estate, home economics, gerontology and sociology. Myers' introductory chapter includes theoretical and empirical evidence of interrelationships between demographic research and housing as an institution. He contributes a chapter on *filtering in time* which has empirical evidence as well as conceptual and historical foundations. He provides a chapter on demographic contributions to the literature, with headings: impact of housing costs, local migration is housing based, housing characteristics link to household characteristics, and small-area demography. His final section on multi-disciplinary opportunities, has headings on: how formal demographic variables shape housing demand, how occupational and educational characteristics shape demand, housing careers intertwined with other life-course decisions, integrating changes in household structures with changes in residential mobility, and integrating the changing life course with changing urban patterns. Myers' writing contributes not only to residential, but to *all* real estate market categories.

James A. Sweet (1990) contributed a chapter in Myers' (1990) reference and text book. Sweet reported on research from two Human Development grants from the U.S. Department of Health and Human Services. The author analyzed associations between demographic processes, the family life cycle, and housing demand. Changes in the life cycle composition of the United States have modified all consumption patterns particularly housing. Age structure, first marriage patterns, cohabitation, marital disruption, remarriage, birth rates, and several household composition variables are relevant. Under the latter, the author analyzes: never married households, married couples with no children, married couples with children under age 18, one-parent families, households of formerly married persons with no children under 18, and households of elderly persons. Professor Sweet reviewed changes in housing

choices and reaches the following conclusions: home ownership increases for every category *except* formerly married persons with children under 12; rental of single family homes decreases for all groups *except* young married couples, both with and without children; and young, single persons continue to prefer large apartment buildings but are more likely to recruit a second (young single) person of that category to share expenses. The author concluded that this latter group and one-parent families will continue to seek apartment living, primarily for financial reasons.

Spain (1990) analyzes housing quality and affordability among female householders. The number of female householders is increasing faster than other housing categories, they have the fewest economic resources, they are concentrated in urban and metropolitan central cities, and their residential relocation rates are higher than married couples. Female householders pay a higher proportion of their incomes for housing costs than all other householder groups (including married and unmarried men). Results from Spain's multivariate analyses indicate the following: concentration of female households in central cities is driven by employment opportunities and access to public transportation (female householders are less likely to own motor vehicles). The author concluded that factors other than income are operating to produce rent reductions for men and greater cost burdens for women. She recommended that Fair Housing legislation should be enforced and expanded to provide affordable shelter for women and their children. Spain's informal forecasts indicated that housing demand for rental apartments, particularly modest units, will increase.

Megbolougbe and Cho (1996) published a journal article on racial and ethnic differences in housing demand. This well referenced article summarizes findings from 26 previous inquiries on this topic and race and/or ethnic status were significant independent variables, in 22 of those inquiries. That is, households and families comprising non-white or Hispanic origin inhabitants were significantly less likely to seek better quality housing through their adult years. The authors report on *their* econometric study which included 34 additional independent variables. It is concluded that the difference between black and white housing demand results, to a significant degree

from residual components, i.e., direct effects of race. The residual effect explains 71 percent of the difference in demand for owners and 48 percent for renters.

Thus far in this review, only Hodgkinson (1993) and Problem Solving (1998) have focused their research on South Carolina. A publication which has direct benefits for South Carolina real estate markets, is a report titled *The South Carolina Housing Affordability Index, 1989-1990* by Ronald C. Rogers (1991). This index is based on: median family income, median price of a single-family home, and current mortgage interest rate and terms. Data are retrieved from the Office of Thrift Supervision, Federal National Mortgage Association, and the U.S. Department of Housing and Urban Development. Primary data are collected from local participating Boards of Realtors. The index for South Carolina and individual metropolitan areas is identical to the National Association of Realtors, Housing Affordability Index. The author concluded that housing is more affordable in South Carolina than in the U.S. and significantly better for first-time buyers in the state. The Housing Affordability Index also is a useful indicator of housing demand and prices.

Literature on this topic includes another South Carolina reference, this one from David J. Cowen (1998) titled *Spatial Analysis of Multi-Listing Service (MLS) Data*. Benefits from using a Geographic Information System (GIS) data base for real estate marketing were discussed. Examples of GIS, utilizing demographic inputs for selected geographic areas are presented. MLS applications for real estate marketing are explained. This reference is a

good example of research applications using additional and innovative data inputs in GIS, which will be useful for many public and private sector organizations.

Federal Reserve Banks also have concerns about population characteristics and change. Marsh (1996) published a report for the Federal Reserve Bank of Richmond, in which she reviewed community investment

opportunities in the Columbia, South Carolina metropolitan region. Variables in her analysis included: number of inhabitants, income, percent crowded dwelling units, cost-burdened home owners and renters, and population per square mile. She concluded that neighborhoods vary significantly by all of these variables. Marsh discusses needs for and consequences of renewed community investment in this region. She concludes that this entity has positive indicators but a few crowded and cost-burdened neighborhoods are problematic.

The final reference on South Carolina is from McLean (1997) who investigated residential relocation, geographic redistribution, and regions in the state which experience growth and those not sharing in this wealth. Approximately 18 percent of the households *currently* living in South Carolina will change their residence each and every year and seven percent will cross at least one county boundary in doing so. These mobility patterns are expected to continue. Since modest declines in birth rates are occurring, the state will be more dependent on in-migration for future inhabitants. Larger numbers and proportions of our population will be in the urban residential category and in counties already comprising large numbers of inhabitants. Economic growth will continue to be concentrated in urban areas.

The following literature is synthesized from Myers (1990) (1992) and from several previously reviewed references. The body of knowledge reveals a wide range of topics, research approaches and variables analyzed. Nevertheless, there is consensus that three models are at work in determining housing characteristics and demand. Census data and variables from other sources are assumed for each. Several hundred variables may be re

Economic Cohort. This model refers to births, survival rates and resulting numbers of persons in each age cohort. Economic characteristics are tabulated for each cohort, usually from a decennial census, and then repeated every ten years. Thus, accurate and systematic data are available while concentrating on the economics of housing.

Life Cycle. This approach is based on evidence that households and families, as they age, seek to reside in different types of housing which coincide with their respective ages. First-time households are likely to live in

modest apartments or small detached dwelling, families with children and those having more than two generations often demand larger detached units, households nearing retirement prefer modern but smaller dwellings, and retired persons seek apartments or assisted living entities.

Life Course. This model assumes that all individuals, households and families need and consume housing throughout their life spans. Multivariate research can then be designed for detailed housing analysis, within respective geographic areas. Examples of variables and cross tabulations: housing characteristics by age of occupants, size of household, labor force participation, income, educational attainment, and tenure (owner/ renter). Short-term housing demand and specific needs can be formulated. Myers' (1992) Housing Based Model is an extension of this approach.

METHODS AND PROCEDURES

Geographic areas selected for this research are the combined states (region) consisting of South Carolina and North Carolina and the two respective individual states. Data were retrieved for 46 South Carolina counties and 100 North Carolina counties. Lists of South Carolina and North Carolina counties are provided in Appendix C on pages 83 and 84.

Most of the variables for this study were selected from the 1990 Census of Population and Housing. These variables were chosen to reflect major demographic constructs such as age, gender and race, vital statistics, education, household and family characteristics. Many economic variables were processed including labor force participation, income, occupation and industry of employment. Also represented on the list of final variables are financial indicators such as banking, housing characteristics and building permits. Variables relating to social programs such as Social Security, health services indicators and public assistance are included. A list of all variables which were available for analysis is presented in Appendix E, pages 87-106.

Variables were assembled using data from several sources. The majority of the data were from a commercial file, Census CD+Maps. This file utilized data compiled from the United States Department of Commerce, Bureau of the Census, Summary Tape Files; the United States Department of Commerce, Bureau of the Census, "Counties" CD; and from a private sector company, the Third Wave Research Group, Ltd. The United States Department of Commerce files contained additional data from sources such as the U.S. Department of Health and Human Services, the Social Security Administration and the Bureau of Economic Analysis. Variables were standardized according to the universe from which they were drawn. Raw data were converted to percentages, per capita or ratio data. Substantial numbers of variables were standardized as median values.

Not all data are available for each and every geopolitical entity. Projections for 1997 and 2002 were not

available below county level. State and county data are the most consistent and reliable and therefore the majority of the analyses were conducted on the aggregate level using county data. Analyses were conducted on all the counties of each state individually and on the combined counties of South and North Carolina.

Social scientists are concerned with the many interrelationships between institutions of society, especially those of the causal nature, it is thus essential to utilize research methodology that addresses this issue. Causality may be difficult to establish because of the interactions and associations between variables. Consequently, for research using demographic data, multivariate analysis is appropriate

Of all the techniques available to social scientists for the study of causal relationships, multiple linear regression is probably the most widely utilized. Not only does the regression model help predict which variables are influencing the dependent variable, but also indicates the strength of this relationship. The relative importance of each independent variable to the model is represented by the partial regression coefficients. These coefficients explain how much the value of the dependent variable will change when the independent variable increases by one unit and the values of the other independent variables remain unchanged (Halli and Rao, 1992 and Norusis, 1996).

Because of the complexity of the issues being addressed and the suitability of the procedure, the most pertinent methodological choice for this project was multiple regression/ correlation analysis.

Variables representative of an exhaustive range of topics influencing population change were chosen, using the Review of Literature, pages 6-22, as a guide. All topics and constructs from that review and those recommended by respective authors are included. The final variable list includes additional factors affecting population dynamics as well.

Many salient items were eliminated from the analysis due to multicolinearity. The presence of multicolinearity, especially in aggregate data, is an unfortunate reality within social science disciplines, particularly demography. For example, all of the time series data were highly interrelated as were income and poverty. Variables

such as population density, percent urban and rural population, detailed housing characteristics and labor force variables were removed from the analysis because of their direct correlation with other variables.

Regression analyses with the following dependent variable models were conducted: percent population change, 1990-2002; percent change in housing units, 1990-2002; percent change in households, 1990-2002 and percent change in families, 1990-2002. A list of dependent and independent variables used in the models is presented in Appendix D, pages
85 and 86.

Multicolinearity continued to be a problem in the analyses so appropriate statistical procedures were performed. First, as previously mentioned, several variables that were highly correlated with other variables were removed from the analyses. Second, stepwise regressions were conducted for each model (Halli and Rao, 1992). Third, model selection was predicated, in part, on tolerance values for colinearity diagnosis. Problems with heteroscedasticity in several of the models were addressed by utilizing Weighted Least Squares Regression (Cohen and Cohen, 1983).

REGRESSION MODEL FINDINGS

Percent Change in Population: 1990-2002

Region

Regression analysis of North and South Carolina data indicate that population change from 1990-2002 in this region is influenced by multiple variables. Findings from the regression analyses are presented in Table 1, page 34. An explanation of statistical procedures and abbreviation used in this study is presented in Appendix A, pages 77 and 78. Definitions of the dependent and independent variables from final regression models are indicated in Appendix B, pages 79-82.

Among the predictor variables for the region are the percent of housing units built 1989-90 (p=.000), 1985-88 (p=.002) and 1970-79 (p=.016). The dependent variable is also influenced by median household income for 1989 (p=.000), the sex ratio, 1990 (p=.007), the percentage of Percent Migrating From a Different County, 1985-1990 (p=.000), the percentage of the population aged 18-34 in 1990 (p=.009) and the percentage of the population aged 25 or more in 1990 with an Associate degree (p=.012). This model is statistically significant at the .05 level ($F_{8,130}$ = 37.574, p=.000, R=.836) and represents 69.8% of the variance in population change for this area.

The percentage of housing built 1989-90 and median household income exert equivalent effects on population change in South and North Carolina from 1990-2002 (β=.329). The percentage of residents living in the same state but a different county over a five year period (intrastate migration) affects population growth to a lessor extent (β=.260) as does the percentage of the population aged 18-34 in 1990 (β= -.181), the Sex ratio, 19

(β= -.167), those aged 25 years and over with an associate degree in 1990 (β=.157) and the percentage of housing units built 1970-79 (β=.127).

South Carolina

Analysis of South Carolina suggests that the percentage of housing built 1970-79 (p=.003), the median household income in 1989 (p=.000) and the percentage of housing built 1940-49 (p=.014) are significant predictors of population change from 1990-2002 ($F_{3,42}$=36.997, p=.000, R=.852) and represent 72.5% of the variance in the dependent variable.

Median household income for 1989 has the greatest affect on population growth in South Carolina from 1990-2002 (β =.624). The percentage of housing units built 1970-79 and those built 1940-40 have lessor effects (β =.300 and -.261 respectively).

North Carolina

For North Carolina, results of the regression of the independent variables on population change from 1990-2002 indicate that the percentage of housing built 1989-90 (p=.000), the percent of housing built 1980-84 (p=.000), the sex ratio, 1990 (p=.000), median household income for 1989 (p=.000), per capita deposits in banks, 1990 (p= .04), and percent migrating from a different county, 1985-1990 (p=.002) are significant predictors of the dependent variable ($F_{6,86}$=36.753, p=.000, R=.848), and account for 71.9% of the variance in population growth for this period.

Median household income for 1989 has the greatest effect on population change for North Carolina (β =.412) with the percentage of housing built 1989-90 (β=.393) and sex ratio, 1990 (β = -.291) following. The percentage of housing units built 1980-84 (β=.255), the percent migrating from a different county, 1985-1990 (β=.206) and per capita deposits in banks, 1990 (β=-.134) exert the least influence.

Percent Change in Housing Units: 1990-2002

Region

Weighted Least Squares Regression for North and South Carolina indicates that several variables have direct consequences for housing units in these two states. Results for this model are illustrated in Table 2, page 35. The percentage of housing units built in 1989-90 (p=.000) and those built 1985-88 (p=.002) predict the change in housing units as does per capita income for 1989 (p=.003), percent migrating from a different county, 1985-1990 (p=.000), Sex ratio, 1990 (p=.000) and those inhabitants aged 25 or greater with an Associate degree (p=.007). This model is significant at the .05 level ($F_{6,126}$=49.545, p=.000, R=.702) and reflects 68.8% of the variation in the dependent variable due to the independent variables.

For this region, the percentage of housing built 1989-90 has the greatest effect (β=.379) followed by percent

migrating from a different county, 1985-1990 (β=.250) and the percentage of housing units built 1985-88 (β=.230). Per capita income for 1989 and the Sex ratio for 1990, have the same magnitude of influence but in opposing directions (β=.210 and -.210 respectively). The variable with the least influence, but still significant, is the percentage of the population aged 25 and over with an associate degree, 1990 (β=.169).

South Carolina

Although per capita income for 1989 is the most salient predictor (p=.000, β=.528) of percent change in housing units for South Carolina, the dependent variable is also predicted to a large extent, by the age of the housing units. Variables indicating the percentage of housing units constructed from 1940-49 (p=.000) and those units constructed from 1970-79 (p=.003) are both found in this model along with the percentage change in single family building permits from 1990-94 (p=.005). This model is significant at the .05 level ($F_{4,40}$=47.856, p=.000, R=.909) and accounts for 82.7% of the variation in the dependent variable.

As indicated previously, the predictor having the most effect in South Carolina is per capita income for 1989 (β=.528). Following per capita income is the percentage of housing built from 1940-49 (β= -396) and housing units built between 1970-79 (β=.261). Lastly, the percent change in single family building permits 1990-94 was also found to be predictive (β= -.198) for South Carolina.

North Carolina

In analyzing regression results for North Carolina, it was found that, once again, the age of housing units is significantly predictive. The percentage of housing units built 1989-90 (p=.000) and those built 1985-88 (p=.000) are both indicators of the change in housing units from 1990 to 2002. Also included in this model are sex ratio, 1990

(p=.000), percentage of housing units with a mortgage and expending 35% or more of their income for selected monthly costs, 1990 (p=.022), percent migrating from a different county, 1985-1990 (p=.009) and percent of the population aged 25 and over with an Associate degree, 1990 (p=.009). This model is statistically significant at the .05 level ($F_{6,81}$=27.151, p=.000, R=.817) and explains 66.8% of the variation in the change in housing units from 1990 to 2002.

For North Carolina, the relative influence of the percentage of housing units built from 1985-1988 (β=.363) and those housing units built from 1989-90 (β=.360) differs very little. Having lessor impact is sex ratio, 1990 (β=–.272), percent migrating from a different county, 1985-1990 (β=.206), those individuals aged 25 and over with an Associate degree, 1990 (β=.184) and those housing units with a mortgage and expending 35% or more of their income for selected monthly costs, 1990 (β= -.155).

Percent Change in Households: 1990-2002

Region

Weighted Least Squares Regression analysis on the dependent variable, percent change in households from 1990-2002, results in several predictor variables for regional data. Findings for this model are presented in Table 3, page 36. Among these variables are the percentage of housing units built 1985-1988 (p=.001), per capita income for 1989 (p=.000), percentage of housing units built 1989-90 (p=.000), percent migrating from a different county, 1985-1990 (p=.000), sex ratio, 1990 (p=.001), percentage of housing built 1970-79 (p=.002), percentage of population with an Associate degree (p=.004) and the percentage of householders aged 65 or greater (p=.017). This model is significant at the .05 level ($F_{8,122}$=27.622, p=.000, R=.803) and represents 64.4% of the variation in the change in households from 1990-2002.

Per capita income exerts the most influence on the percent change in households (β=.379) with the percentage of housing units built 1989-90 (β=.293) and the percentage of housing units built 1985-88 (β=.250) following. Also predictive of change in households for this region are percent migrating from a different county, 1985-1990 (β=.241), percent of population aged 25 and over with an Associate degree (β=.201), the sex ratio, 1990 (β=-.194), the percentage of housing units constructed 1970-79 (β=.190) and the percentage of householders 65 years of age or greater, 1990 (β=.185).

South Carolina

For South Carolina, predictor variables for change in households are percentage of renter occupied housing without motor vehicles available (p=.001), percentage of housing units built 1940-49 (p=.000), percentage of employed persons 16 years of age or greater, 1990 (p=.013) and percentage of housing units built 1970-79 (p=.041). This model is significant at the .05 level ($F_{4,38}$=28.826, p=.000, R=.867) and accounts for 75.2% of the variation in the dependent variable.

The variable having the strongest effect on the change in households for South Carolina is the percentage of housing units built 1940-49 (β= -.463). Lessor effects are noted for the percentage of renter occupied housing without motor vehicles available (β= -.387), employed persons 16 years of age or greater (β=.273) and the percentage of housing units constructed 1970-79 (β=.192).

North Carolina

Analysis of North Carolina indicates that the percentage of housing built 1985-88 (p=.024) is predictive of

change in households, as is the percentage of those units built 1989-90 (p=.000), per capita income, 1989 (p=.000), the Sex ratio, 1990 (p=.000), percent migrating from a different county, 1985-1990 (p=.018), percentage of urban housing, 1990 (p=.007) and percentage of population age 25 and over with an Associate degree, 1990 (p=.023). This model is statistically significant at the.05 level ($F_{7,80}$=22.265, p=.000, R=.813) and represents 66.1% of the variation in households from 1990-2002.

For North Carolina, the independent variable having the greatest influence on the dependent variable is per capita income, 1989 (β=.333). Other variables having slightly lessor effects are the percentage of housing constructed 1989-90 (β=.307), the sex ratio, 1990 (β= -.260), the percentage of urban housing, 1990 (β= -.240), the percentage of housing constructed 1985-88 (β=.236), Percent migrating from a different county, 1985-1990 (β=.195) and the percentage of the population aged 25 and over with an Associate degree, 1990 (β=.183).

Percent Change in Families: 1990-2002

Region

Weighted Least Squares Regression Analysis of this region for percent change in families for 1990-2002 resulted in a very parsimonious model due to the effects of multicolinearity. Results for this model are illustrated in Table 4, page 37. Median selected owner costs as a percentage of income (p=.000) and the percentage of housing units built 1989-90 were found to be predictive of the dependent variable. This model is statistically significant at the .05 level ($F_{2,131}$=158.564, p=.000, R=.841), accounting for 70.8% of the variation in percent change in families over this time period.

The strongest predictor for the region was median selected monthly owner costs, 1990, with a beta value of .469. The percentage of housing units built in 1989-90 was slightly weaker with a beta value of .444.

South Carolina

Predictor variables for South Carolina include the percentage of housing units constructed 1940-49 (p=.000), median household income, 1989 (p=.000) and the percent change in single family building permits between 1990-94 (p=.006). This regression model is significant at the .05 level ($F_{3,41}$=81.946, p=.000, R=.926) and represents 85.7% of the variation in the percent change in families from 1990-2002.

Although it has a negative effect on the dependent variable, the percentage of housing units built 1940-49 is also the strongest (β= -.615) predictor variable for South Carolina with median household income, 1989 (β=.485) and the percent change in single family building permits from 1990-94 (β= -.188) being somewhat weaker in influence.

North Carolina

Change in the percentage of families in North Carolina is predicted by the percentage of housing units built 1985-88 (p=.007), and housing units built 1989-90 (p=.000) as well as the sex ratio, 1990 (p=.000), median household income, 1989 (p=.002) and percent migrating from a different county, 1985-1990 (p=.004). This model is statistically significant

at the .05 level ($F_{5,83}$=30.309, p=.000, R=.804) and represents 64.6% of the variability in change in the percentage of families in North Carolina.

The most influential predictors for change in families in North Carolina are the percentage of housing units built 1989-90 (β=.383) and percentage of housing units built 1985-88 (β=.266). Following these variables are the sex ratio, 1990 (β= -.261), median household income, 1989 (β=.243) and the percent migrating from a different county, 1985-1990 (β=.227).

Table 1

Regression Model
Percent Change in Population, 1990-2002
South Carolina and North Carolina

Area	Variable	β	t	sig.
Region	Constant		-1.517	.132
n=139	Median Household Income, 1989	.329	4.721	.000
R^2=.698	Percent Housing Units Built, 1989-90	.329	5.254	.000
	Percent Migrating From a Different County, 1985-1990	.260	4.616	.000
	Percent Housing Units Built, 1985-88	.226	3.201	.002
	Percent Population Aged 18-34, 1990	-.181	-2.644	.009
	Sex Ratio, 1990	-.167	-2.732	.007
	Percent Population Aged 25 and Over with an Associate Degree, 1990	.157	2.548	.012
	Percent Housing Units Built, 1970-79	.127	2.444	.016
South Carolina	Constant		-2.586	.013
n=46	Median Household Income, 1989	.624	7.02	.000
R^2=.725	Percent Housing Units Built, 1970-79	.300	3.145	.003
	Percent Housing Units Built, 1940-49	-.261	-2.562	.014
North Carolina	Constant		2.87	.775
n=93	Median Household Income, 1989	.412	6.268	.000
R^2=.719	Percent Housing Units Built, 1989-90	.393	5.713	.000
	Sex Ratio, 1990	-.291	-4.573	.000
	Percent Housing Units Built, 1980-84	.255	3.795	.000
	Percent Migrating From a Different County, 1985-1990	.206	3.243	.002
	Per Capita Deposits in Banks, 1990	-.134	-2.082	.040

Table 2

Regression Model
Percent Change in Housing Units, 1990-2002
South Carolina and North Carolina

Area	Variable	β	t	sig.
Region	Constant		.401	.689
n=133	Percent Housing Units Built 1989-90	.379	5.746	.000
R^2=.688	Percent Migrating From a Different County, 1985-1990	.250	4.239	.000
	Percent Housing Units Built 1985-88	.230	3.187	.002
	Per Capita Income, 1989	.210	3.077	.003
	Sex Ratio, 1990	-.210	-3.690	.000
	Percent Population Aged 25 and Over with an Associate Degree, 1990	.169	2.755	.007
South Carolina	Constant		-2.186	.035
n=45	Per Capita Income, 1989	.528	7.440	.000
R^2=.827	Percent Housing Units Built, 1940-49	-.396	-4.681	.000
	Percent Housing Units Built, 1970-79	.261	3.216	.003
	Percent Change in Single Family Building Permits, 1990-1994	-.198	-2.945	.005
North Carolina	Constant		2.076	.041
n=88	Percent Housing Units Built, 1985-88	.363	3.923	.000
R^2=.668	Percent Housing Units Built, 1989-90	.360	4.781	.000
	Sex Ratio, 1990	-.272	-4.025	.000
	Percent Migrating From a Different County, 1985-1990	.206	2.678	.009
	Percent Population Aged 25 and Over with an Associate Degree, 1990	.184	2.660	.009
	Percent Housing Units with Mortgages Expending >35 Percent of Income, 1990	-.155	-2.337	.022

Table 3

Regression Model
Percent Change in Households, 1990-2002
South Carolina and North Carolina

Area	Variable	β	t	sig.
Region	Constant		-2.492	.014
n=131	Per Capita Income, 1989	.379	4.961	.000
R^2=.644	Percent Housing Units Built, 1989-90	.293	4.553	.000
	Percent Housing Units Built, 1985-88	.250	3.269	.001
	Percent Migrating From a Different County, 1985-1990	.241	3.835	.000
	Percent Population Aged 25 and Over with an Associate Degree, 1990	.201	2.910	.004
	Sex Ratio, 1990	-.194	-3.279	.001
	Percent Housing Units Built, 1970-79	.190	3.245	.002
	Householders Aged 65 and Over, 1990	.185	2.417	.017
South Carolina	Constant		-.396	.694
n=43	Percent Housing Units Built 1940-49	-.463	-4.702	.000
R^2=.752	Percent Renter Occupied Housing Without Motor Vehicles Available, 1990	-.387	-3.540	.001
	Employed Persons Aged 16 Years Old and Over, 1990	.273	2.595	.013
	Percent Housing Units Built, 1970-79	.192	2.111	.041
North Carolina	Constant		.577	.565
n=88	Per Capita Income, 1989	.333	3.719	.000
R^2=.661	Percent Housing Units Built, 1989-90	.307	3.788	.000
	Sex Ratio, 1990	-.260	-3.688	.000
	Percent Urban Housing, 1990	-.240	-2.795	.007
	Percent Housing Units Built, 1985-88	.236	2.302	.024
	Percent Migrating From a Different County, 1985-1990	.195	2.425	.018
	Percent Population Aged 25 and Over with an Associate Degree, 1990	.183	2.320	.023

Table 4

Regression Model
Percent Change in Families, 1990-2002
South Carolina and North Carolina

Area	Variable	β	t	sig.
Region	Constant		-8.552	.000
n=134	Median Selected Monthly Owner Costs, 1990			
R^2=.708		.469	7.127	.000
	Percent Housing Units Built, 1989-90	.444	6.743	.000
South Carolina	Constant		367	.715
n=45	Percent Housing Units Built, 1940-49	-.615	-8.820	.000
R^2=.857	Median Household Income, 1989	.485	7.142	.000
	Percent Change in Single Family Building Permits, 1990-1994	-.188	-2.909	.006
North Carolina	Percent Housing Units Built, 1989-90	.383	4.959	.000
n=89	Percent Housing Units Built, 1985-88	.266	2.743	.007
R^2=.646	Sex Ratio, 1990	-.261	-3.825	.000
	Median Household Income, 1989	.243	3.228	.002
	Percent Migrating From a Different County, 1985-1990	.227	2.956	.004

REGRESSION SUMMARIES

Regression summaries are presented in Tables 5, 6, and 7, pages 42-46, for the region, South Carolina and North Carolina, respectively.

Two precise statistical procedures are important in evaluating regression models. For example, the measure that best describes the proportion of variability in the dependent variables caused by the independent variables is R^2. This value, the squared correlation coefficient, indicates the percentage of variation in the outcome that is explained by the independent or predictor variables. It is used, in part, in determining the adequacy of regression models. Because of differing units of measure for independent variables, the partial regression coefficients are not used for comparison between these variables. Therefore, Beta coefficients, the standardized regression coefficients are used. These Beta values allow for the comparison of the relative importance of the independent variables for predicting the dependent variable.

For the Region, two models have respectable R^2 values. Model 2, Percent Change in Housing Units, has an R^2 of .702 and Model 4, Percent Change in Families, has an R^2 of .708. The independent variable with the highest Beta value, for the Region, is also in Model 4. Median Selected Monthly Owner Costs, 1990, has a Beta value of .469.

For South Carolina, all four models have high R^2 values. Model 1, Median Household Income, has an R^2 of .725. Model 2, Percent Change in Housing Units, has an R^2 of .827. Model 3, Percent Change in Households, has an R^2 of .752, and Model 4, Percent Change in Families has an R^2 of .857. In Model 1, the independent variable, Median Household Income, 1989, has a Beta value of .624. In Model 2, the independent variable, Per Capita Income, 1989, has a Beta value of .528.

For North Carolina, Model 1, Percent Change in Population, has a high R^2 value. That R^2 is .719. the

highest Beta value is also from Model 1. Median Household Income has a Beta value of .412

Regression models for South Carolina confirm the importance of economic development and economic growth for the state. Models with economy-based dependent and independent variables have significant R^2 values. Two independent variables, Median Household Income and Per Capita Income, produce high Beta values. The future of our state depends, in part, on increasing wages and salaries of our labor force

PREDICTIVE ASSOCIATIONS FROM REGRESSION MODELS

One objective of regression analysis is to implement statistical procedures which provide the best estimates of the relationship of the independent variables to the dependent variable. This procedure allows researchers to estimate the effects of one variable on another by using a variation on the equation for a line, y = mx +b. In the regression equation, $y = a + b_1x_1 + b_2x_2 \; Y \; b_px_p + e$, y is the predicted value of the dependent variable, a is the constant or intercept when all the independent variables are equal to zero and x represents the independent variables. The regression slope or partial regression coefficient, b, indicates the change in y that would be predicted for a one unit change in x while controlling for the other independent variables. Consequently, it is estimated that for each one unit change in the independent variable, there is a corresponding change, b, in the dependent variable.

An essential aspect of the regression equation is its additive nature. The effects of the independent variables are cumulative and the overall effects of these variables are an aggregate total of the individual changes in each independent variable. Therefore, caution must be used in interpreting the effects of any single variable on a specific outcome (Halli and Rao, 1992).

Tables 8, 9 and 10, pages 48-50, illustrate the partial results of the multivariate analysis using the regression equation. As was previously indicated, interpretation of these variables must be based on the effects of other independent variables on the overall outcome. Table 8, presents the predictive associations of independent variables for the Region.

Table 9, page 49, indicates the predictive associations for South Carolina's most significant independent variables. Model 1 is Change in Population and the most significant independent variable is median household income. Each one thousand dollar increase in median household income will produce a 1.2 percent increase in population 1990-2002. Model 2 is Change in Housing Units and the most significant independent variable is per capita income. Each one thousand dollar increase in Per Capita Income will produce a 2.8 percent increase in housing

units, 1990 -2002.

Table 10, page 50, presents the predictive associations for North Carolina's most significant independent variables. Model 1 is Change in Population and the most significant independent variable is Median Household Income. Each one thousand dollar increase in median household income will produce a 1.2 percent increase in North Carolina population, 1990-2002. Model 3 is Change in Households and the most significant independent variable is Per Capita Income. Each one thousand dollar increase in per capita income will produce a 1.7 percent increase in North Carolina households, 1990-2002. Model 4 is Change in Families and the most significant independent variable is Housing Units Built 1989-1990. Each percent increase in housing units built those two years, will produce a 4.6 percent increase in North Carolina families 1990-2002.

The above are truly significant and relevant dependent and independent variables. North Carolina's population growth and increasing numbers of families are dependent on the state's economy; i.e., increasing income for households and families. Both will depend, in part, on the state's real estate industry. Quality housing stock must be added in North Carolina communities.

Table 5

Region
Multiple Regression Results, Dependent Variable Models by Significant Independent Variables

Model 1: Percent Change in Population, 1990-2002

Variables	Beta Values
Median Household Income, 1989	.329
Percent Housing Units Built, 1989-90	.329
Percent Migrating From a Different County, 1985-1990	.260
Percent Housing Units Built, 1985-88	.226
Percent Population Aged 18-34, 1990	-.181
Sex Ratio, 1990	-.167
Percent Population Aged 25 and Over with Associate Degree, 1990	.157
Percent Housing Units Built, 1970-79	.127

R^2= .698

Model 2: Percent Change in Housing Units, 1990-2002

Variables	Beta Values
Percent Housing Units Built, 1989-90	.379
Percent Migrating From a Different County, 1985-1990	.250
Percent Housing Units Built, 1985-88	.230
Per Capita Income, 1989	.210
Sex Ratio, 1990	-.210
Percent Population Aged 25 and Over with Associate Degree, 1990	.169

R^2= .702

Table 5 continued

Model 3: Percent Change in Households, 1990-2002

Variables	Beta Values
Per Capita Income, 1989	.379
Percent Housing Units Built, 1989-90	.293
Percent Housing Units Built, 1985-88	.250
Percent Migrating From a Different County, 1985-1990	.241
Percent Population Aged 25 and Over with Associates Degree, 1990	.201
Sex Ratio, 1990	-.194
Percent Housing Units Built, 1970-79	.190
Householders Aged 65 or Greater, 1990	.185

R^2= .644

Model 4: Percent Change in Families, 1990-2002

Variables	Beta Values
Median Selected Monthly Owner Costs, 1990	.469
Percent Housing Units Built, 1989-90	.444

R^2= .708

Table 6

South Carolina
Multiple Regression Results, Dependent Variable Models by Significant Independent Variables

Model 1: Percent Change in Population, 1990-2002

Variables	Beta Values
Median Household Income, 1989	.624
Percent Housing Units Built, 1970-79	.300
Percent Housing Units Built, 1940-49	-.261

R^2= .725

Model 2: Percent Change in Housing Units, 1990-2002

Variables	Beta Values
Per Capita Income, 1989	.528
Percent Housing Units Built, 1940-49	-.396
Percent Housing Units Built, 1970-79	.261
Percent Change in Single Family Building Permits, 1990-1994	-.198

R^2= .827

Table 6 continued

Model 3: Percent Change in Households, 1990-2002

Variables	Beta Values
Percent Housing Units Built, 1940-49	-.463
Percent Renter Occupied Housing Units without Motor Vehicles, 1990	-.387
Employed Persons 16 Years Old or Greater, 1990	.273
Percent Housing Units Built 1970-79	.192

R^2= .752

Model 4: Percent Change in Families, 1990-2002

Variables	Beta Values
Percent Housing Units Built, 1940-49	-.615
Median Household Income, 1989	.485
Percent Change in Single Family Building Building Permits, 1990-1994	-.188

R^2= .857

Table 7

North Carolina
Multiple Regression Results, Dependent Variable Models by Significant Independent Variables

Model 1: Percent Change in Population, 1990-2002

Variables	Beta Values
Median Household Income, 1989	.412
Percent Housing Units Built, 1989-90	.393
Sex Ratio, 1990	-.291
Percent Housing Units Built, 1980-84	.255
Percent Migrating From a Different County, 1985-1990	.206
Per Capita Deposits in Banks, 1990	-.134

R^2= .719

Model 2: Percent Change in Housing Units, 1990-2002

Variables	Beta Values
Percent Housing Units Built, 1985-88	.363
Percent Housing Units Built, 1989-90	.360
Sex Ratio, 1990	-.272
Percent Migrating From a Different County, 1985-1990	.206
Percent Population Aged 25 and Over with Associate Degree, 1990	.184
Percent Housing Units with Mortgages Expending More Than 35% of Income for Selected Costs, 1990	-.155

R^2= .668

Table 7 continued

Model 3: Percent Change in Households, 1990-2002

Variables	Beta Values
Per Capita Income, 1989	.333
Percent Housing Units Built, 1989-90	.307
Sex Ratio, 1990	-.260
Percent Urban Housing, 1990	-.240
Percent Housing Units Built, 1985-88	.236
Percent Migrating From a Different County, 1985-1990	.195
Percent Population Aged 25 and Over with Associate Degree, 1990	.183

R^2= .661

Model 4: Percent Change in Families, 1990-2002

Variables	Beta Values
Percent Housing Units Built, 1989-90	.383
Percent Housing Units Built, 1985-88	.266
Sex Ratio, 1990	-.261
Median Household Income, 1989	.243
Percent Migrating From a Different County, 1985-1990	.227

R^2= .646

Table 8

Region
Magnitude of Dependent Variable Caused by Designated Changes in Significant Independent Variable

Model 1

Each one thousand dollar increase in median household income for 1989 yields a .8 increase in the percent change in population for 1990-2002.

Model 2

For each percent of increase in housing units constructed during 1989-1990, there is a related 3.6 increase in percent change in housing units for 1990-2002.

Model 3

Each one thousand dollar increase in per capita income for 1989 yields a 1.8 increase in the percent change in households for 1990-2002.

Model 4

Each one hundred dollar increase in median selected owner costs yields a 4.3 increase in the percent change in families for 1990-2002.

Table 9

South Carolina
Magnitude of Dependent Variable Caused by Designated Changes in Significant Independent Variable

Model 1

Each one thousand dollar increase in median household income for 1989 yields a 1.2 increase in the percent change in population, 1990-2002.

Model 2

Each one thousand dollar increase in per capita income for 1989 yields a 2.8 increase in the percent change in housing units, 1990-2002.

Model 3

For each percent increase in housing constructed from 1940 to 1949, there is a 2.1 decrease in the percent change in households, 1990-2002.

Model 4

For each percent increase in the percentage of housing constructed from 1940 through 1949, there is a 2.9 decrease in the percent change in families, 1990-2002.

Table 10

North Carolina
Magnitude of Dependent Variable Caused by Designated Change in Significant Independent Variable

Model 1

Each one thousand dollar increase in median household income for 1989 yields a 1.2 increase in the percent change in population, 1990-2002.

Model 2

For each percent increase in housing units built 1985-1988, there is a corresponding 1.1 increase in percent change in housing units, 1990-2002.

Model 3

Each one thousand dollar increase in per capita income for 1989 yields a 1.7 increase in the percent change in households, 1990-2002.

Model 4

For each percent increase in housing units built during 1989-1990 there is a corresponding 4.6 increase in percent change in families, 1990-2002.

INTERPRETATIONS

Discussion in this section will focus on how and why independent variables produce changes in dependent variables. Every model will be reviewed and the Region (South Carolina and North Carolina combined counties), South Carolina and North Carolina models will be explained. Independent variables will be discussed by the order of their predictive power.

Model 1, Percent Change in Population, 1990-2002

Region

(a) Median Household Income, 1989

This is a basic indicator of household well-being. Households with substantial income are employed, may derive income from other sources and contribute to the economy and culture of their region. Population increase is predicted in areas where household incomes are high.

(b) Percent Housing Units Built, 1989-1990

The 1990 Census of Population and Housing was conducted April 1, 1990. The occupants of these housing units are the newest residents at their home sites, counted by our most recent Census. These households and families often have more than one member in the labor force. They may have migrated from another area to their current region. Increasing numbers of recently built housing units are likely result in population growth.

(c) Percent Migrating from a Different County, 1985-1990

This is *in-migration* which is the most effective means for population growth. Births add to the inhabitant base but need two decades to be productive. Migration is often household or family based; i.e., two, three, or more persons move. Migration is generally for economic reasons. People move to a better

economic base and for employment. Population growth is, in part, dependent on migration.

(d) Percent Housing Units Built, 1985-1988

These are relatively new housing units, being added to the housing stock during the past 14 years. Households and families inhabiting these units are likely to be employed, more than one member in the labor force, above average household incomes, and are middle aged or mature adults. This independent variable contributes to increases in population.

(e) Percent Population, 18-34 Years of Age, 1990 (negative sign)

This may be termed a "notch years of age category." Many individuals are enrolled in post high school education or in the military. The former has no income, the latter has modest income. Married persons and families with children are in the initial and formative stages of their work cycle. Their incomes are low or moderate, and changes in employment may be frequent. Such characteristics do not contribute to long-term population growth.

(f) Sex Ratio (negative sign)

This independent variable suggests that additional males in a population will result in stable or declining inhabitants. Females live longer than males so the proportion of widows and other single females in a community contribute to this statistical association. Some colleges and universities enroll more males than females and

those areas may not grow. Military installations are usually predominantly male. These three types of communities can expect stable or declining inhabitant numbers.

(g) Percent Population Aged 25 and Over With an Associate Degree

Individuals with an associate degree have completed their education and initial family formation stages. They may have had employment prior to earning their associate degree and are assured of employment

following receipt of their degree. The region probably has an economic development program which utilizes workers with education and training. Increasing inhabitants with an associate degree contribute to population growth.

(h) Percent Housing Units Built, 1970-1979

These are *not old* housing units. The inhabitants purchased their homes, have maintained them and are likely to be home owners. Employed household members have job security and seniority, are near their salary peaks and may have more than one household member in the labor force. These households will probably retire in their current region of residence. Some of these inhabitants are *mature migrants*. They migrate to the area and purchase or rent a home similar to their prior residential experience. Percent housing units built the past 25 years contribute to population growth.

South Carolina

a) Median Household Income, 1989

This is a basic indicator of household well-being. Households with substantial income are employed, may derive income from other sources and contribute to the

economy and culture of their region. Population increase is predicted in areas where household incomes are high.

(b) Percent Housing Units Built, 1970-1979

These are *not old* housing units. The inhabitants purchased their homes, have maintained them and are likely to be home owners. Employed household members have job security and seniority, are near their salary peaks and may have more than one household member in the labor force. These households will

probably retire in their current region of residence. Some of these inhabitants are *mature migrants*. They migrate to the area and purchase or rent a home similar to their prior residential experience. Percent housing units built the past 25 years contribute to population growth.

(c) Percent Housing Units Built, 1940-1949 (negative sign)

Although there are many housing units in the state built prior to 1940, residential areas with large numbers from that era are problematic. Some construction during World War II was hurried and of modest quality. Many of these units should be renovated or removed from the housing stock. Communities with large shares of these housing units are likely to experience stable or declining population.

North Carolina

(a) Median Household Income, 1989

This is a basic indicator of household well-being. Households with substantial income are employed, may derive income from other sources and contribute to the economy and culture of their region. Population increase is predicted in areas where household incomes are high.

(b) Percent Housing Units Built, 1989-1990

The 1990 Census of Population and Housing was conducted April 1, 1990. The occupants of these housing units are the newest residents at their home sites, counted by our most recent Census. These households and families often have more than one member in the labor force. They may have migrated from another area to their current region. Increasing numbers of recently built housing units are likely to result in population growth.

(c) Sex Ratio, 1990 (negative sign)

This independent variable suggests that additional males in a population will result in stable or declining inhabitants. Females live longer than males so the proportion of widows and other single females in a community contribute to this statistical association. Some colleges and universities enroll more males than females and those areas may not grow. Military installations are usually predominantly male. These three types of communities can expect stable or declining inhabitant numbers.

(d) Percent Housing Units Built, 1980-1984

Many residents in this category have built or purchased a better quality home, are near their most productive working years, and have job security. Their children are likely to be in the upper teens, twenties and will soon leave the home or have done so. Other members of this group may be somewhat younger or older but their occupations and futures are similar. Residential relocation to these areas, is common. This independent variable is likely to contribute to population growth.

(e) Percent Migrating from a Different County, 1985-1990

This is *in-migration* which is the most effective means for population growth. Births add to the inhabitant base but need two decades to be productive. Migration is often household or family based; i.e., two, three, or more persons move. Migration is generally for economic reasons. People move to a better economic base and for employment. Population growth is, in part, dependent on migration.

(f) Per Capita Deposits in Banks (negative sign)

First, large banks are located in urban central cities which are losing population. Large banks may invest reserves in international, national, or regional opportunities rather than in local infrastructure. Banking functions are information, computer and electronic based. Thus, few employees are added. Financial centers in North Carolina do not enhance population growth.

Model 2, Percent Change in Housing Units, 1990-2002

Region

(a) Percent Housing Units Built, 1989-1990

The 1990 Census of Population and Housing was conducted April 1, 1990. The occupants of these housing units are the newest residents, at their home sites, counted by our most recent census. These households and families are likely to have more than one member in the labor force. They may have migrated from another area to their current region. Future housing stock gains often follow increasing numbers of recently built homes.

(b) Percent Housing Units Built, 1985-1988

These are relatively new housing units, being added to the housing stock during the past 14 years. Households and families inhabiting these units are likely to be employed, more than one member in the labor force, above average household incomes, and are middle aged or mature adults. This independent variable contributes to housing stock increases.

(c) Percent Migrating from a Different County, 1985-1990

This is *in-migration* which is the most effective means to enhance housing demand. Births add to the inhabitant base but need two decades to be productive. Migration is often household or family based; i.e., two, three, or more persons move. Migration is generally for economic reasons. People move to a better economic base and for employment. Housing stock is, in part, dependent on migration.

(d) Per Capita Income, 1989

Per capita income is probably the optimum measure of economic resources for the population. The human base for this statistic is the entire population and the monetary base is aggregate cash income. Residential

areas with moderate and higher per capita income have diversified economic bases, high rates of labor force participation and employment in sought after occupations. Quality of public and private services are more than adequate. Regions with high per capita income are expected to experience housing unit gain

(e) Sex Ratio, 1990 (negative sign)

This independent variable suggests that additional males in a population will result in stable or declining inhabitants. Females live longer than males so the proportion of widows and other single females in a community contribute to this statistical association. Some colleges and universities enroll more males than females and those areas may not grow. Military installations are usually predominantly male. These three types of communities can expect stable or declining housing units.

(f) Percent Population Aged 25 and Over With an Associate Degree

Individuals with an associate degree have completed their education and initial family formation stages. They may have had employment prior to earning their associate degree and are assured of employment following receipt of their degree. The region probably has an economic development program which utilizes workers

with education and training. Increasing inhabitants with an associate degree contribute to housing stock growth.

South Carolina

(a) Per Capita Income, 1989

Per capita income is probably the optimum measure of economic resources for the population. The human base for this statistic is the entire population and the monetary base is aggregate cash income. Residential areas with moderate and higher per capita income have diversified economic bases, high rates of labor force

participation and employment in sought after occupations. Quality of public and private services are more than adequate. States with high per capita income are expected to experience housing unit gains.

(b) Percent Housing Units Built, 1940-1949 (negative sign)

Although there are many housing units in the state built prior to 1940, residential areas with large numbers from that era are problematic. Some construction during World War II was hurried and of modest quality. Many of these units should be renovated or removed from the housing stock. Communities with large shares of these housing units are likely to experience stable or declining housing stock.

(c) Percent Housing Units Built, 1970-1979

These are *not old* housing units. The inhabitants purchased their homes, have maintained them and are likely to be home owners. Employed household members have job security and seniority, are near their salary peaks and may have more than one household member in the labor force. These households will probably retire in their current region of residence. Some of these inhabitants are *mature migrants*. They migrate to the area and purchase or rent a home similar to their prior residential experience. Percent housing units built the past 25 years contribute to total housing stock gains.

(d) Percent Change in Single Family Building Permits, 1990-1994 (negative sign)

There were needs, in some areas of South Carolina for housing stock additions during the 1980s. Attempts were made, 1990-1994 to remedy those needs. Some of these, both permits and completed dwellings, were of higher or lower cost than was the demand from households in those areas.

North Carolina

(a) Percent Housing Units Built, 1985-1988

These are relatively new housing units, being added to the housing stock during the past 14 years. Households and families inhabiting these units are likely to be employed, more than one member in the labor force, above average household incomes, and are middle aged or mature adults. This independent variable contributes to total housing stock increases.

(b) Percent Housing Units Built, 1989-1990

The 1990 Census of Population and Housing was conducted April 1, 1990. The occupants of these housing units are the newest residents, at their home sites, counted by our most recent Census. These households and families often have more than one member in the labor force. They may have migrated from another area to their current region. Future housing stock gains are likely to follow increasing numbers of recently built homes.

(c) Sex Ratio, 1990 (negative sign)

This independent variable suggests that additional males in a population will result in stable or declining inhabitants. Females live longer than males so the proportion of widows and other single females in a community contribute to this statistical association. Some colleges and universities enroll more males than females and those areas may not grow. Military installations are usually predominantly male. These three types of communities can expect stable or declining housing units.

(d) Percent Migrating from a Different County, 1985-1990

This is *in-migration* which is the most effective means for economic growth. Births add to the inhabitant base but need two decades to be productive. Migration is often household or family based; i.e., two, three, or more persons move. Migration is generally for economic reasons. People move to a better economic base and for employment. Housing stock is, in part, dependent on migration.

(e) Percent Population Aged 25 and Over With an Associate Degree

Individuals with an associate degree have completed their education and initial family formation stages. They may have had employment prior to earning their associate degree and are assured of employment following receipt of their degree. The region probably has an economic development program which utilizes workers

with education and training. Increasing inhabitants with an associate degree contribute to rising housing unit numbers.

(f) Percent Households with Mortgage Expending Greater than 35 Percent of Income (negative sign)

It is reasonable to assume that areas with adequate housing need lending institutions and those purchasing homes need mortgages. There is, nevertheless, a mortgage spending threshold. When mortgage expenditures exceed 30 percent of income, the residential area has problems. The area may have unemployment, low wages and salaries, and limited economic infrastructure. In North Carolina, large proportions of households expending 35 percent or more of their incomes on mortgage payments, contribute to stable or declining population.

Model 3, Percent Change in Households, 1990-2002

Region

(a) Per Capita Income, 1989

Per capita income is probably the optimum measure of economic resources for the population. The human base for this statistic is the entire population and the monetary base is aggregate cash income. Residential areas with moderate and higher per capita income have diversified economic bases, high rates of labor force participation and employment in sought after occupations. Quality of public and private services are more than adequate. Regions with high per capita income are expected to experience household gains.

(b) Percent Housing Units Built, 1989-1990

The 1990 Census of Population and Housing was conducted April 1, 1990. The occupants of these housing units are the newest residents at their home sites, counted by our most recent Census. These households and families often have more than one member in the labor force. They may have migrated from another area to their current region. Increasing numbers of recently built housing units are likely to result in growth of households

(c) Percent Housing Units Built, 1985-1988

These are relatively new housing units, being added to the housing stock during the past 14 years. Households and families inhabiting these units are likely to be employed, more than one member in the labor force, above average household incomes, and are middle aged or mature adults. This independent variable contributes to increases in households.

(d) Percent Migrating from a Different County, 1985-1990

This is *in-migration* which is the most effective means for household growth. Births add to the inhabitant base but need two decades to be productive. Migration is often household or family based; i.e., two, three, or more persons move. Migration is generally for economic reasons. People move to a better economic base and for employment. Household growth is, in part, dependent on migration.

(e) Percent Population Aged 25 and Over With an Associate Degree

Individuals with an associate degree have completed their education and initial family formation stages. They may have had employment prior to earning their associate degree and are assured of employment following receipt of their degree. The region probably has an economic development program which utilizes workers with education and training. Increasing inhabitants with an associate degree contribute to

household growth.

(f) Sex Ratio (negative sign)

This independent variable suggests that additional males in a population will result in stable or declining inhabitants. Females live longer than males so the proportion of widows and other single females in a community contribute to this statistical association. Some colleges and universities enroll more males than females and those areas may not grow. Military installations are usually predominantly male. These three types of communities can expect stable or declining household numbers.

(g) Percent Housing Units Built, 1970-1979

These are *not old* housing units. The inhabitants purchased their homes, have maintained them and are likely to be home owners. Employed household members have job security and seniority, are near their salary peaks and may have more than one household member in the labor force. These households will probably retire in their current region of residence. Some of these inhabitants are *mature migrants*. They migrate to the area and purchase or rent a home similar to their prior residential experience. Percent housing units built the past 25 years contribute to growth of households.

(h) Percent Householders 65 Years of Age and Over

The population 65 years of age and older is a diverse group. Some need and use few public services while some require special care. Incomes may range from poverty to wealthy. Many states covet this group, particularly if they age in place or migrate to their new community prior to age 65. Their incomes are higher than state averages and are secure. Higher proportions of persons 65 years of age and older may contribute to growth of total households for the region.

South Carolina

(a) Percent Housing Units Built ,1940-1949 (negative sign)

Although there are many housing units in the state built prior to 1940, residential areas with large numbers from that era are problematic. Some construction during World War II was hurried and of modest quality. Many of these units should be renovated or removed from the housing stock. Communities with large shares of these housing units are likely to experience stable or declining households.

(b) Percent Renter Occupied Housing Without Motor Vehicle, 1990 (negative sign)

First, renters are somewhat disadvantaged, compared to home owners. Although public transportation is available in some South Carolina cities, the majority of renters in the state do not have that service. Transportation, particularly by motor vehicle, enables households and families to enter and remain in the labor force. Absence of motor vehicles may contribute to declining household numbers.

(c) Employed Persons 16 Years of Age and Older

Employment is essential for a nation, region, state and community. The culture, social system, and economy depend on high rates of employment. This independent variable is crucial for South Carolina. Areas in the state with high proportions of persons 16 years of age and older, are likely to experience household growth.

(d) Percent Housing Units Built, 1970-1979

These are *not old* housing units. The inhabitants purchased their homes, have maintained them and are likely to be home owners. Employed household members have job security and seniority, are near their salary peaks and may have more than one household member in the labor force. These households will probably retire in their current region of residence. Some of these inhabitants are *mature migrants*. They migrate to the area and purchase or rent a home similar to their prior residential experience. Percent housing units built the past 25 years contribute to household growth.

North Carolina

(a) Per Capita Income

Per capita income is probably the optimum measure of economic resources for the population. The human base for this statistic is the entire population and the monetary base is aggregate cash income. Residential areas with moderate and higher per capita income have diversified economic bases, high rates of labor force participation and employment in sought after occupations. Quality of public and private services are more than adequate. Regions with high per capita income are expected to experience household gains.

(b) Percent Housing Units Built, 1989-1990

The 1990 Census of Population and Housing was conducted April 1, 1990. The occupants of these housing units are the newest residents at their home sites, counted by our most recent Census. These households and families often have more than one member in the labor force. They may have migrated from another area to their current region. Increasing numbers of recently built housing units are likely to result in growth of households.

(c) Sex Ratio (negative sign)

This independent variable suggests that additional males in a population will result in stable or declining inhabitants. Females live longer than males so the proportion of widows and other single females in a community contribute to this statistical association. Some colleges and universities enroll more males than females and those areas may not grow. Military installations are usually predominantly male. These three types of communities can expect stable or declining household numbers.

(d) Percent Urban Housing (negative sign)

This independent variable reflects the urban, *central city* areas of North Carolina. These residential

centers attracted households for a century but are now losing population. It is likely that households will continue to decline in the large urban centers.

(e) Percent Housing Units Built, 1985-1988

These are relatively new housing units, being added to the housing stock during the past ten years. Households and families inhabiting these units are likely to be employed, more than one member in the labor force, above average household incomes, and are middle aged or mature adults. This independent variable will contribute to household gains.

(f) Percent Migrating from a Different County, 1985-1988

This is *in-migration* which is the most effective means for growth in households. Births add to the inhabitant base but need two decades to be productive. Migration is often household or family based; i.e., two, three, or more persons move. Migration is generally for economic reasons. People move to a better economic base and for employment. Household growth is, in part, dependent on migration.

(g) Percent Population Aged 25 and Over With an Associate Degree, 1990

Individuals with an associate degree have completed their education and initial family formation stages. They may have had employment prior to earning their associate degree and are assured of employment following receipt of their degree. The region probably has an economic development program which utilizes workers with education and training. Increasing inhabitants with an associate degree contribute to household growth.

Model 4, Percent Change in Families, 1990-2002

Region

(a) Median Selected Monthly Owner Costs, 1990

This is a crucial independent variable because families are more likely to be home owners than non-family households. It is clear that many families in the region have adequate incomes and discretionary funds to improve their homes. Local infrastructure provides all essential services, value of these homes are well above

average, and repairs and improvements are expedited when needed. This independent variable contributes to increasing numbers of families.

(b) Percent Housing Units Built, 1989-1990

The 1990 Census of Population and Housing was conducted April 1, 1990. The occupants of these housing units are the newest residents, at their home sites, counted by our most recent Census. These households and families often have more than one member in the labor force. They may have migrated from another area to their current region. Increasing numbers of recently built housing units may produce growth in numbers of families.

South Carolina

(a) Percent Housing Units Built, 1940-1949 (negative sign)

Although there are many housing units in the state built prior to 1940, residential areas with large numbers from that era are problematic. Some construction during World War II was hurried and of modest quality. Many of these units should be renovated or removed from the housing stock. Communities with large shares of these housing units are likely to experience stable or declining numbers of families.

(b) Median Household Income, Income, 1989

This is a basic indicator of household well-being. Households with substantial income are employed, may

derive income from other sources and contribute to the economy and culture of their region. Rising numbers of families are predicted in areas where household incomes are high.

(c) Percent Change in Single Family Building Permits, 1990-1994, (negative sign)

There were needs, in some areas of South Carolina for housing stock additions during the 1980s and attempts were made, 1990-1994 to remedy those needs. Some of these, both permits and completed dwellings, were of higher or lower cost than was the demand from households in those areas.

North Carolina

(a) Percent Housing Units Built, 1989-1990

The 1990 Census of Population and Housing was conducted April 1, 1990. The occupants of these housing units are the newest residents at their home sites, counted by our most recent census. These households and families often have more than one member in the labor force. They may have migrated from another area to their current region. Increasing numbers of recently built housing units may produce growth in numbers of families.

(b) Percent Housing Units Built, 1985-1988

These are relatively new housing units, being added to the housing stock during the past 14 years. Households and families inhabiting these units are likely to be employed, more than one member in the labor force, above average household incomes, and are middle aged or mature adults. This independent variable will contribute to rising numbers of families.

(c) Sex Ratio, 1990 (negative sign)

This independent variable suggests that additional males in a population will result in stable or declining inhabitants. Females live longer than males so the proportion of widows and other single females in a community contribute to this statistical association. Some colleges and universities enroll more males than

females and those areas may not grow. Military installations are usually predominantly male. These three types of communities can expect stable or declining family numbers.

(d) Median Household Income, 1989

This is a basic indicator of household well-being. Households with substantial income are employed, may derive income from other sources and contribute to the economy and culture of their region. Increasing numbers of families are predicted in areas where household incomes are high.

(e) Percent Migrating from a Different County, 1985-1990

This is *in-migration* which is the most effective means for population growth. Births add to the inhabitant base but need two decades to be productive. Migration is often household or family based; i.e., two, three, or more persons move. Migration is generally for economic reasons. People move to a better economic base and for employment. Rising numbers of families in communities are, in part, dependent on migration.

SOUTH CAROLINA AND NORTH CAROLINA

There is some good news for South Carolina. Regression models for the state include the significant independent variables of median household income and per capita income. Incomes have increased during the recent past in South Carolina and forecasts indicate that growth will continue for these indicators. Another positive result is the independent variable, percent employed persons aged 16 and over, 1990 in Model 3. This variable is not a predictor in any region or North Carolina model.

However, an independent variable, in two separate models, produces significant negative signs. The variable is: percent housing units built from 1940-1949. This condition affects many communities in South Carolina. Dependence on housing of that era may yield stable or declining households and families. Another problem for the state is the independent variable: percent renter occupied housing without a motor vehicle. Economic development cannot be expedited if potential employees don't have transportation.

North Carolina demonstrates strengths within four regression models. Significant independent variables include: median household income; per capita income; percent housing units built, 1989-1990; and percent housing units built, 1985-1988. Income has increased in North Carolina and, based on estimates and projections, their home building rates have contributed to household and economic growth.

The independent variable: percent migrating from a different county, 1985-1990, is significant in all four North Carolina regression models. Many individuals, households and families move from other states to that state each year, and larger numbers move from county-to-county within the state. North Carolinians respond to economic opportunities and create demand for housing stock additions within their state.

The independent variable: percent population 25 years of age and older with an associate degree, is significant in two of the North Carolina models. Growth of households and housing units in that state are, in part, dependent on education, particularly proportion of the adult population earning and benefitting from an associate

degree.

Growth rates are higher in North Carolina than in South Carolina for several inter-related reasons. In North Carolina, opportunity structures are available for higher wages and salaries; individuals earn associate degrees; households and families migrate, albeit to counties and communities providing employment; demand for housing is created; and housing units are built.

Returning to South Carolina, median household income, per capita income, percent employed persons aged 16 and over, certainly are important. Efforts to provide higher wages and salaries in South Carolina must continue. Housing stock should be added in selected areas. The following counties are suggested: Aiken, Anderson, Beaufort, Berkeley, Colleton, Dorchester, Florence, Georgetown, Greenville, Horry, Kershaw, Lexington, Oconee, Pickens, Richland, Spartanburg and York. Finally, South Carolinians should not fear migration. Residential relocation is essential for economic growth.

FURTHER RESEARCH

The research reported in this manuscript should be replicated following the 2000 Census of Population and Housing. Additional data are available from several Censuses at five year intervals. Other U.S. Department of Commerce data are collected on an annual basis. Data from other federal, state and private sources should be retrieved and processed. Although the authors collected and analyzed a large number of variables, additional entries can and should be investigated. Research of this nature contributes to several disciplines and particularly to multivariate analysis in demography. Findings and interpretations have real-world relevance and outreach prospects. Economic development, economic growth, and real estate development and marketing are priority endeavors.

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