DETERMINANTS OF MIGRATION IN TEXAS COUNTIES:

ECONOMICS VS. AMENITIES

THESIS

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I. INTRODUCTION

Migration has been one of the most perplexing human processes to explain. Perhaps two factors offer the most compelling reasons for human migration. Over one hundred years ago Ravenstein (1885) contended that economic factors were paramount in explaining people's movements. More recently, others have pointed to the increasing influence of service or environmental amenities in explaining migration flows. This study investigates which of these two, economics or amenities, have a stronger influence on inter-county-migration in Texas.

Geographers (Halseth 1999; Jackson and Day 1993; Manson and Groop 2000; Newbold 1996; Plane and Rogerson 1994; Shumway and Otterstrom 2001; Svart 1976; Wiseman and Roseman; Wolpert 1965), sociologists (Biggar 1979; Chevan and Fischer 1979), economists (Berger and Blomquist 1992; Clark and Hunter 1992; Fournier, Rasmussen and Serow 1988a, 1988b; Serow 1987a, 1987b), and many other researchers have studied migration. Historically, sociologists studying migration have looked at amenities, group interactions, the community, and other aspects of social organization. Economists, on the other hand, have investigated employment, cost-of-living, and other financial incentives for moving. As a geographer, I examined spatial patterns and place attributes of geographic, sociological and economic factors in migration revealing whether it is amenities or financial concerns that more strongly explain reasons for migration.

Employment possibilities, cost of living, climate, and recreational potential all contribute to the utility of a place (Lieber 1978). In turn, these economic factors and amenities make a place more attractive for migrants (Berger and Blomquist 1992). This research explores whether economic or amenity variables are more significant determinants of migration. If we know migration to be more closely related to economic situations or amenities, then we can use this information to attract new migrants to places or to predict where higher rates of in-migration may occur. Although international migration, whether legal or illegal, is an important component in population growth and change in Texas, this thesis focuses on internal migration in Texas from 1995-2000 at the county level.

II. RESEARCH QUESTION AND HYPOTHESIS

This research attempts to answer if economic concerns or amenities are more significant in explaining in-migration in Texas counties from 1995-2000. Table 1 lists the specific variables tested in a step-wise regression model and the expected relationship between the dependent (in-migration) and independent variables. The regression model will allow us to discern the relative importance of each variable in the analysis. Overall, I hypothesize economic considerations will more likely determine migration.

Table 1: Hypothesized Relationship of Independent Variables to In-Migration

INDEPENDENT VARIABLES		
CONCEPTUAL	OPERATIONAL	HYPOTHESIZED RELATIONSHIP
Economics		
Cost of Living	Median Value of Owner Occupied Housing 1990	Negative
	Property Taxes 1992	Negative
Employment	Percent Unemployed Average between 1995 and 2000	Negative
	Median Income in 1989	Positive
Amenities		
Natural	Natural Amenities Scale	Positive
Services	Food and Accommodation Establishments 1992	Positive
	Entertainment and Recreation Establishments 1992	Positive
	Presence of a University	Positive
Social/ Geographic	MSA counties	Positive
	Percent Adults with a Bachelor's Degree	Positive

III. THEORETICAL FRAMEWORK

Lee (1966, 48) broadly defines migration "as a permanent or semi-permanent change of residence" and discusses four main factors in migration decisions: factors associated with the area of origin, factors associated with the area of destination, intervening obstacles, and personal factors. This research focuses on the determinants of in-migration using aggregate data, and therefore examines factors associated with destination area. Decisions based on factors associated with destination area are the result of perceived advantages at the new location (Lee 1966). Although Lee did not refer to this as such, this concept is the basis of Place Utility Theory.

Place Utility Theory has become classic theory in migration study and is used as the foundation of this research. Place Utility Theory investigates characteristics of a place in relation to their perceived utility (Wolpert 1965). Place Utility Theory explains how migration occurs when a household or an individual decide that another location may offer additional benefits from those available at the present location. Potential destinations are evaluated in regard to their prospective utility when compared to the previous or current location (Wolpert 1965).

Lieber (1978) designed a methodology to test characteristics relevant to place utility. College degree candidates were surveyed as to where they would migrate, assuming certain employment conditions including having been offered identical jobs in

multiple places, having received one job offer, and having not received any job offers. Three main characteristics of place utility emerged despite differing scenarios1) distance/travel time to and size of major city 2) distance/travel time and type of fresh air recreation (including lakes and oceans) and 3) distance/travel time to nearest relatives.

Economic attributes such as income and employment enhance place utility; however, amenity factors such as services, housing, the community, and recreation do as well (Gustavus and Brown 1977). Destination choice is strongly influenced by quality of life factors (climate, urban conditions, and environmental quality), wage, and housing costs (Berger and Blomquist 1992). Indeed, people are pulled to locations with more place utility.

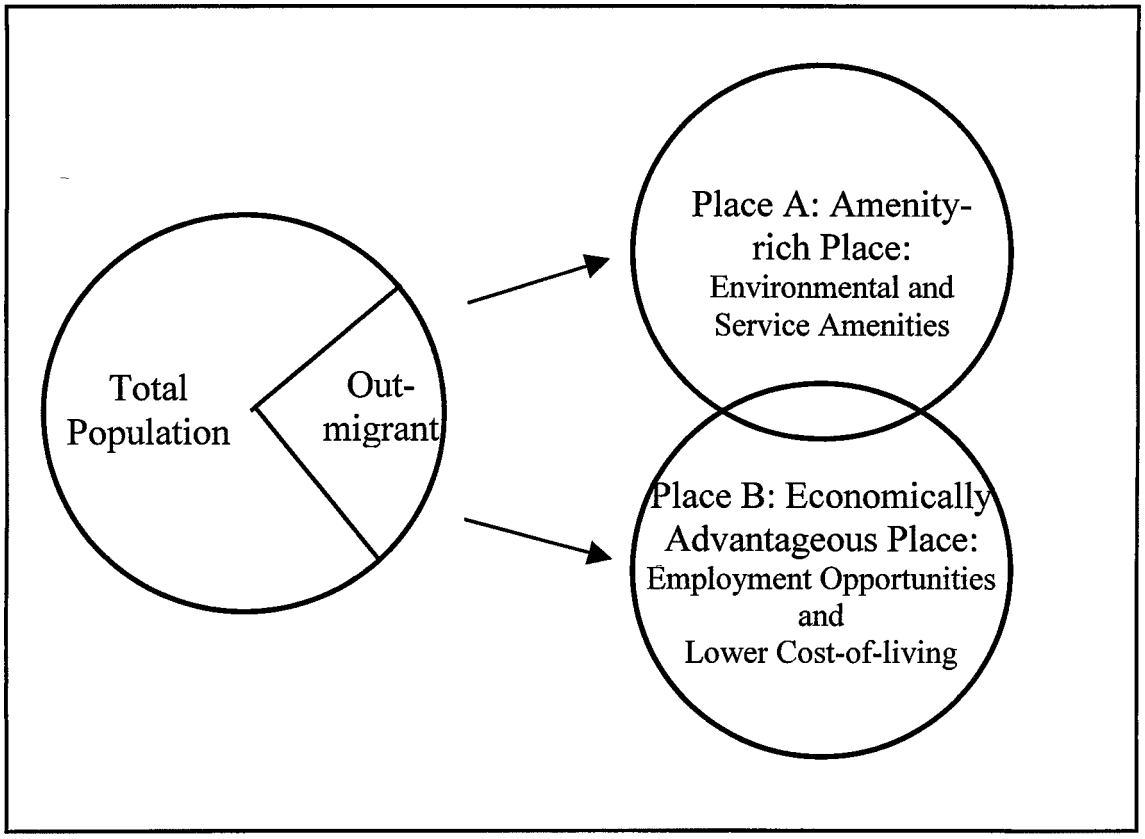
Heberle (1938) introduced the concept that migration is influenced by push and pull factors. Push factors, or dissatisfaction, cause someone to leave their place of origin, while one is pulled to a location with more advantages. The present research focuses on in-migration and place attributes. Therefore, emphasis is placed on the pull factors of a place. Pull factors can include enhanced employment and income, a better environment, increased standard of living, and opportunity for recreational, cultural, and intellectual activities (Bogue 1969).

Figure 1 details place utility theory and pull factors in the context of this research. Migrants decide whether Amenity-rich Place A with environmental and service amenities or Economically Advantageous Place B with employment opportunities and lower cost of living, or a combination of these, provide the most benefits.

Real and perceived differences between places indeed influence the destination-choice of migrants. Although one's perceptions of a place are important in

migration studies, a quantitative analysis using aggregate data cannot take this into account.

Fig. 1: Conceptual Model of Research



IV. LITERATURE REVIEW

In migration research many studies have pointed to the importance of economic and amenity factors. This literature review examines work concerned with the effects of cost of living, employment, climate, and recreational water as determinants of migration.

Cost of Living

In developed countries, one's destination choice is often based on cost-of-living. Migrants prefer to move to areas with a lower cost of living (Serow 1987b), and low local taxes per capita, in particular, is an important explanatory variable for where career military personnel retire (Jackson and Day 1993). A study of white, male migrants from 1970 to 1980 revealed that middle-aged migrants (30-44) preferred areas with low housing costs, while elderly migrants are attracted to higher value areas, perhaps indicating that these higher value areas provide amenities to the older population (Clark and Hunter 1992).

An investigation of the importance of economic and climatic incentives for elderly migrants found cost-of-living to be the most significant explanatory factor (Fournier et al. 1988a, 1988b). Other elderly migration research has discovered an increase of in-migration to areas with lower cost of living (Pampel et al.1984;

Serow et al. 1986); however, one study revealed a higher rate of retirees migrating to areas with higher property taxes in the southeast U.S. (Serow 2001). Perhaps higher property taxes are found in areas with more amenities; therefore, the migrants chose to pay higher taxes in exchange for lots of amenities.

A low cost of living can increase employment opportunities because low cost-of-living can attract businesses. Classical equilibrium theory suggests that areas with lower cost of living and, by logical extension, lower wages should entice both new industry and migrants (Harris and Todaro 1971).

Employment

Employment plays an important role in migration decisions, especially for working-age migrants. Surveys have revealed employment considerations (including job transfers, new jobs, and looking for employment) to be the main reasons for moving (Long and Hansen 1979; Svart 1976). Seventy percent of community members in three rural British Columbia communities moved to their current location because of economic or employment factors (Halseth 1999). Throughout the U.S., in-migration for working age, white males increased in areas of greater employment growth (Clark and Hunter 1992), while employment opportunities have also played a significant role in location decisions for younger career military personnel upon retirement from active duty (Jackson and Day 1993). In addition, employment has also played a role in migration to the Sunbelt. When industry relocated into the U.S. South in the 1960s and 1970s, jobs were created and economic incentives attracted service-oriented businesses and people to

locate in the southern and western parts of the U.S. (Biggar 1979). This research tests the relative significance of employment in recent migration destinations.

Amenity-rich Areas

Changing trends in migration patterns during the 1960s, 1970s, and 1980s have been attributed to amenities. Beginning in the 1950s, a migration stream from the snowbelt to the sunbelt emerged. This was probably in part due, especially for older Americans, to the warmer climate of the South. During the 1970s, non-metropolitan areas grew by 15.1 percent compared with only 10.2 percent growth in metropolitan areas. The attraction of migrants to amenity-rich areas was a factor in this urban-rural reversal of population flows (Plane and Rogerson 1994). Amenity-rich areas include places deemed to have environmental advantages, cultural activities and recreational opportunities. During the 1970s there was an increase of in-migration to amenity-rich areas by the elderly (Wiseman and Roseman 1979). The most rapidly growing non-metropolitan counties during the 1970s,1980s, and 1990s were identified as recreational counties based on recreational earnings, employment, and seasonal housing (Beale and Johnson 1998). These rapidly growing counties include those located in the Gulf Coast, Florida, and the West (excluding Southern California). Significant growth also occurred in the Texas "Hill Country," the Southern Appalachians, the "lakes and forest" region of Michigan-Wisconsin-Minnesota, and the Ozark Plateau (Manson and Groop 2000). These are areas associated with natural beauty and outdoor recreation.

Several counties in the Mountain West region have experienced rapid population growth attributed to environmental and service amenities. A distinct cluster of high-

growth rural counties in this region has been identified as an area with a high percentage of employees employed in entertainment (Sutton and Day in press). Factors such as mining and manufacturing industries, farming, government, and environmental amenities have contributed to the growth in the 1990s. Areas with ample environmental amenities, particularly the scenic mountainous regions, were experiencing the greatest population growth (Shumway and Otterstrom 2001). In Idaho non-metropolitan areas with growth of lodging, amusement, and recreation also experienced rapid population growth (Smutny 2002).

Places with the potential for recreation attract both retirees and younger migrants. The presence of state recreation areas pulls white, male migrants over the age of 35 (Clark and Hunter 1992). In Idaho, scenic beauty and outdoor recreation were among the top five reasons why retirees chose their community (Carlson et al. 1998). The fastest growing counties in the early 1990s were centers of recreation or destinations for retirees (Johnson and Beale 1994).

Climate

In the United States and Canada, climate plays a major role in deciding to leave a place or deciding where to relocate (Serow 1987b). During the 1970s the Sunbelt region of the United States became the fastest growing region of the country and it has never relinquished this title. Several interested researchers concluded that the Sunbelt climate is an important influence on migrants, especially retirees. Warm climates, especially warm winters are very significant variables in elderly and working-age migration decisions

(Chevan and Fischer 1979; Fournier et al. 1988a; Fournier et al. 1988b; Frey, Liaw, and Lin 2000; Jackson and Day 1993; Newbold 1996; Serow et al. 1986; Svart 1976; Walters 1994). One study of migrants aged 55-64 found climate to be the most important factor in migration decisions (Pampel et al. 1984). Twelve percent of migrants over 55 stated that the desire for a change of climate was the primary motive for moving (Long and Hansen 1979). Elderly in-migration to U.S. counties also increases due to the presence of sunshine (Clark and Hunter 1992). A warmer climate tends to be a great pull factor for the elderly.

Climate played a role in attracting business to the Sunbelt; however, other attractive factors included cheaper energy, lower taxes, and available land (Biggar 1979).

Recreational Water

Coastal or lake regions are significant in determining where people move (Svart 1976). Between 1950 and 1990, the location of a county on the Gulf or Atlantic Coast was a significant predictor of white, retirement migration (Serow 2001). Coastal counties throughout the U.S. are attractive to older Americans (Clark and Hunter 1992, Jackson and Day 1993). Locations close to lakes are favored even more than coastal areas by people approaching their retirement years (Pampel et al. 1984).

V. STUDY AREA

During the 1960s and early 1970s Texas grew more rapidly than the nation and the Sunbelt region of the South, however growth was not consistent throughout the state. During this time the fastest growing areas of Texas included the Gulf Coast and the Capital region (the Austin metropolitan area). In the 1970s other areas began to experience high growth including the Lower, Middle and Upper Rio Grande Valley, Central Texas, and the Brazos Valley. Negative and low growth occurred in the Panhandle, North Texas, and the Permian Basin (Burghardt 1978, Nickels and Day 1997).

By 1980, more than one-third of Texas residents were born outside of Texas (Marshall and Bouvier 1986). Between 1985 and 1990, Texas ranked fourth as a destination state for elderly migrants (Frey, Liaw, and Lin 2000). Between 1965 and 1990, counties in the Texas Hill Country were growing due to an influx of retirees (Day and Bartlett 2000).

Regions of Texas continued to grow during the 1990s due to natural increase, in-migration and immigration. By 1994, Texas was the most rapidly growing state in the U.S. in terms of numbers (Murdock 1995; Murdock and Hoque 1995), and ranked the tenth most rapidly growing state in percentage terms (Murdock 1997). Natural increase accounted for the majority of this growth (55%), while internal migration (24%) and immigration (21%) contributed to remainder of the growth (Murdock 1995). Suburbs

showed the highest rates of net migration, followed by nonmetropolitan adjacent areas, nonmetropolitan nonadjacent areas, and finally by central city counties. Overall the Rio Grande Valley, Central and South Texas were the fastest growing, with slower growth rates in the Permian Basin and the South Plains region (Murdock and Hoque 1995; Murdock and Hoque 1994). Four of the top ten fastest growing metropolitan areas within the U.S. from 1990-1996 were found in Texas: Laredo (#2), McAllen-Edinburg-Mission (#3), Austin-San Marcos (#7), and Brownsville-Harlingen-San Benito (#10) (Austin American Statesman, 1 January 1998).

The Texas counties that received the greatest number of migrants in the early 1990s were the state's largest counties: Harris, Bexar, Dallas, and Tarrant. A few other counties also showed high rates of growth including Collin, Edwards, Fort Bend, and Frio counties (Murdock and Hoque 1994). Collin is a suburban county in the Dallas-Fort Worth MSA and Fort Bend is part of the Houston MSA. Growth in Edwards and Frio Counties, which are located in the Texas Hill Country, may be attributed to retiree and recreational migration.

Texas is comprised of 254 counties. This diversity and sheer number of counties lends itself well to statistical analysis. However, levels of in-migration vary considerably for counties for many reasons. Some counties are quite small in total size, and therefore rather volatile and sometimes undependable statistically. On the other hand, the large urban counties have such large populations to render in-migration rates meaningless. In addition, there appears to be little logic in attempting to correlate their in-migration rates to county-wide descriptors. This aside, the characteristics of the vast majority of Texas counties appear to be statistically meaningful.

VI. METHODOLOGY

Although a survey could precisely solicit reasons why people move, it would not be cost-effective to conduct such for the entire state of Texas. Further, this study focuses on place attributes rather than individual decision-making. Therefore, in order to determine what factors most significantly explain migration in Texas from 1995-2000, I worked with aggregate data for Texas counties.

The county was chosen as the scale of analysis for two important reasons. First, unlike Metropolitan Statistical Area, the county allows examination of metropolitan and non-metropolitan growth. Between 1990 and 1992 the net migration rate to non-metropolitan areas was only slightly less than for metropolitan areas (Johnson and Beale 1994). Therefore it is important to include both rural and urban areas in this study. Although there can be much variation within a county, which may argue for a study utilizing census tracts, all the selected economic and amenity data is available at the county level. In particular the natural amenity scale, arts and recreation establishment, and food and accommodation establishment data is not available in units smaller than the county.

Multiple regression allows a final explanatory model to determine what relationships exist between the variables. The regression determines the relative importance of each variable. In the following discussion the dependent and independent

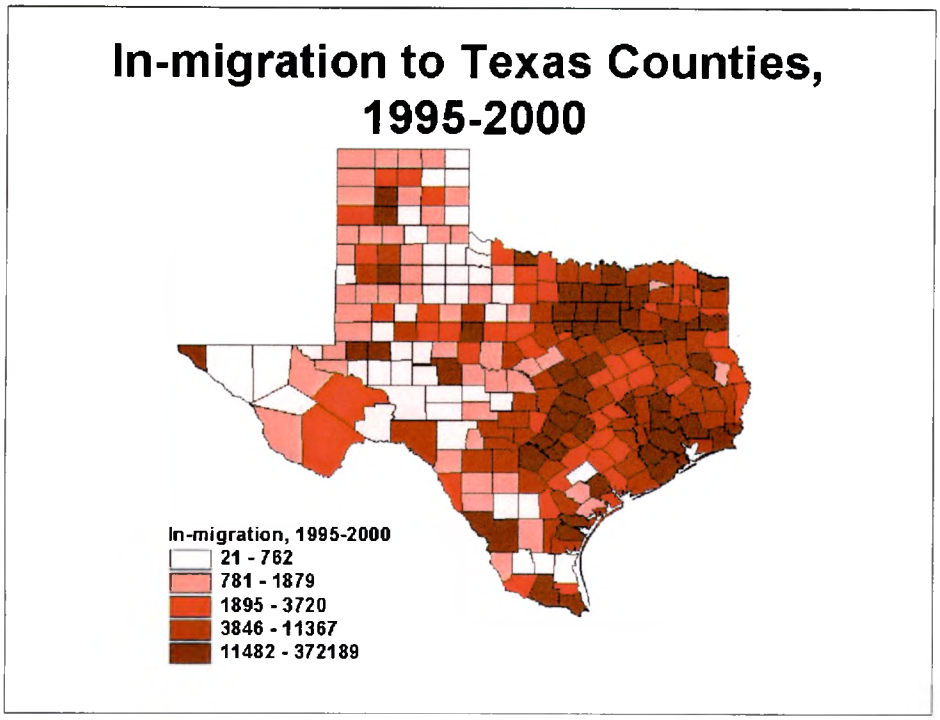
variables are described in their operational form. The confidence level for entering and keeping all independent variables in this analysis is .05, or a 95% confidence that the effects of the independent variables were not random. The analysis was conducted with SPSS for all counties in Texas.

Dependent Variable

The dependent variable is the number of migrants moving into the county (Figure 2). This data is available from the 2000 Census SF3, P24. Specifically this data is looking at migrants moving to Texas counties from different counties within Texas and the United States. Using raw numbers account for counties that are very small and therefore, due to their size, will not attract a large number of migrants. Further, very populated counties will be able to absorb more migrants. However, when viewing migration into a large county as a percent, the percent becomes quite small discounting the true impact of in-migrants. The raw number of migrants per county should account for these extremes.

As expected, the clusters of counties with the highest number of migrants are those in and around the Austin, Dallas-Fort Worth, and Houston areas (Figure 2). In general, more people are moving into East Texas over the West Texas, Panhandle, and South Texas regions.

Fig. 2: In-Migration to Texas Counties, 1995-2000

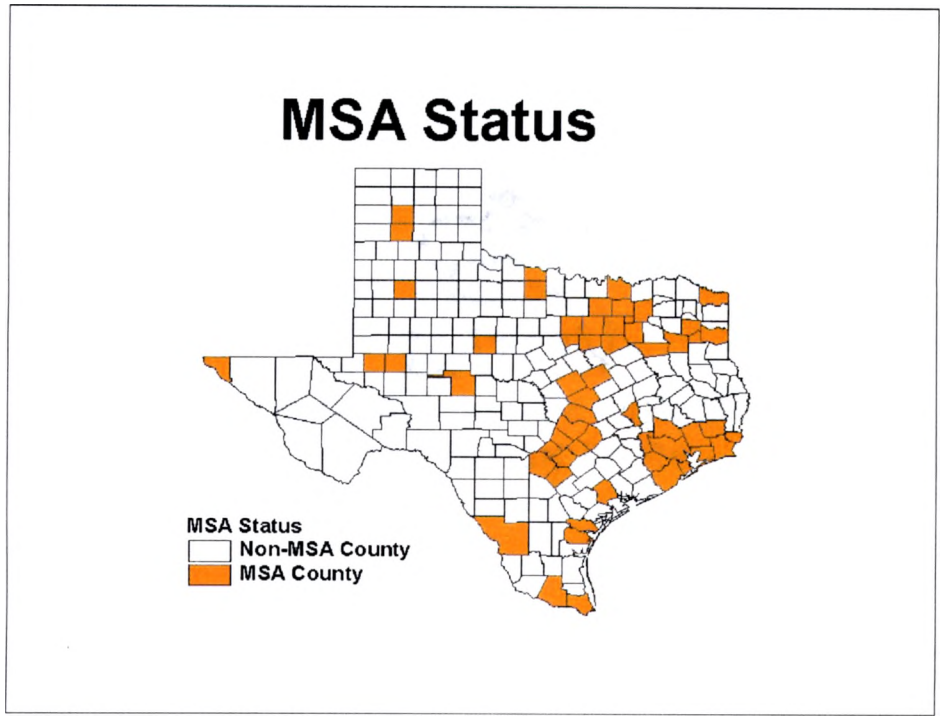


Independent Variables

Geographic Variable

After examining the map of the dependent variable, I discovered a variable that falls outside my stated framework, but contributes to an explanation of internal migration. The spatial distribution of in-migrants to Texas reveals that many of the high-migration counties are part of a large metropolitan statistical area (MSA). These include the counties surrounding Dallas-Fort Worth, Houston, San Antonio, and Austin. In order to control for this pattern, a MSA variable was included in the analysis. A dummy variable identified whether a county was a MSA county or not. This data comes from the Texas State Data Center, which lists all MSA counties for the state of Texas (Figure 3).

Fig. 3: MSA Counties



Economic Variables

The following variables were employed to account for the economic reasons underlying migration. Two variables represent employment (unemployment rate and median income), and two variables (median housing value and property taxes per capita) evaluate the cost of living within a place. The cost-of-living index could not be used since it is only available for MSAs. All of the variables, except for unemployment, use early 1990s data to allow time for the information to diffuse through the population. Also, using data before 1995 ensures that variables are not a result of migration. In an ideal world all of these study variables would be available in the same year. However, the necessary data is not all released in the same year. Therefore, the population data is from

the 1990 Census while the Economic Census and Census of Government data is from 1992.

Cost-of-living is an important component of migration research (Fournier 1988a, 1988b; Pampel et al. 1984; Serow et al. 1986). Housing costs, a surrogate for cost-of-living, has been used as an economic factor in determining in-migration (Carlson et al. 1998; Clark and Hunter 1992). The median value of owner-occupied housing is from the 1990 U.S. Census STF3, H76 (Figure 4).

Property taxes are also a determinant of migration (Carlson et al. 1998; Clark and Hunter 1992). The 1992 U.S. Census of Government lists property taxes as taxes measured by the value of owned property and are reported as the total revenue generated for the county. This value was divided by the total population for the county (Figure 5).

Fig. 4: Median Housing Value, 1989

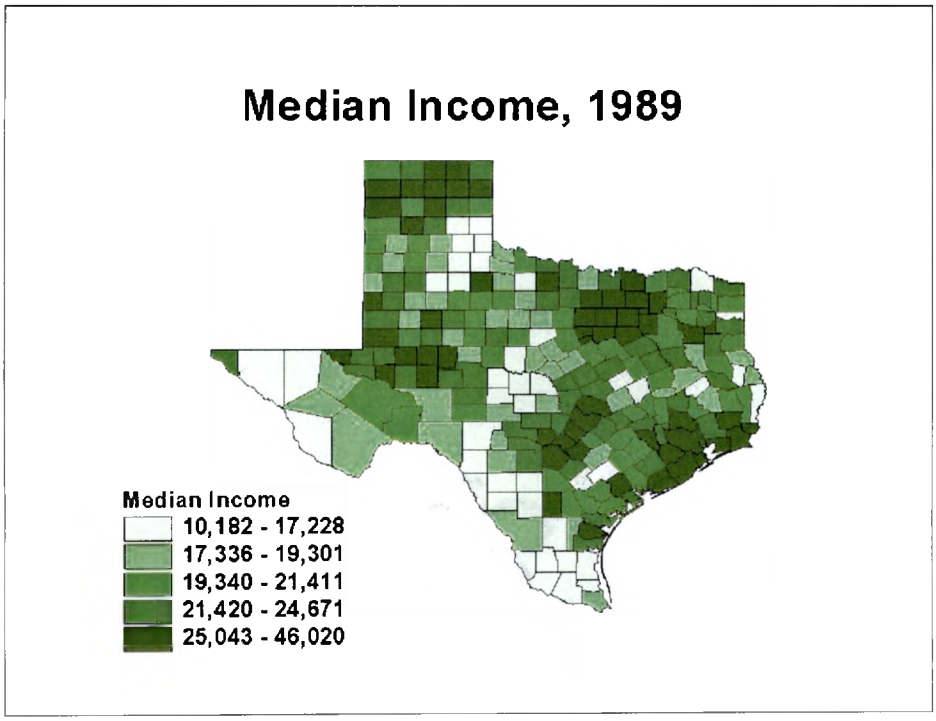
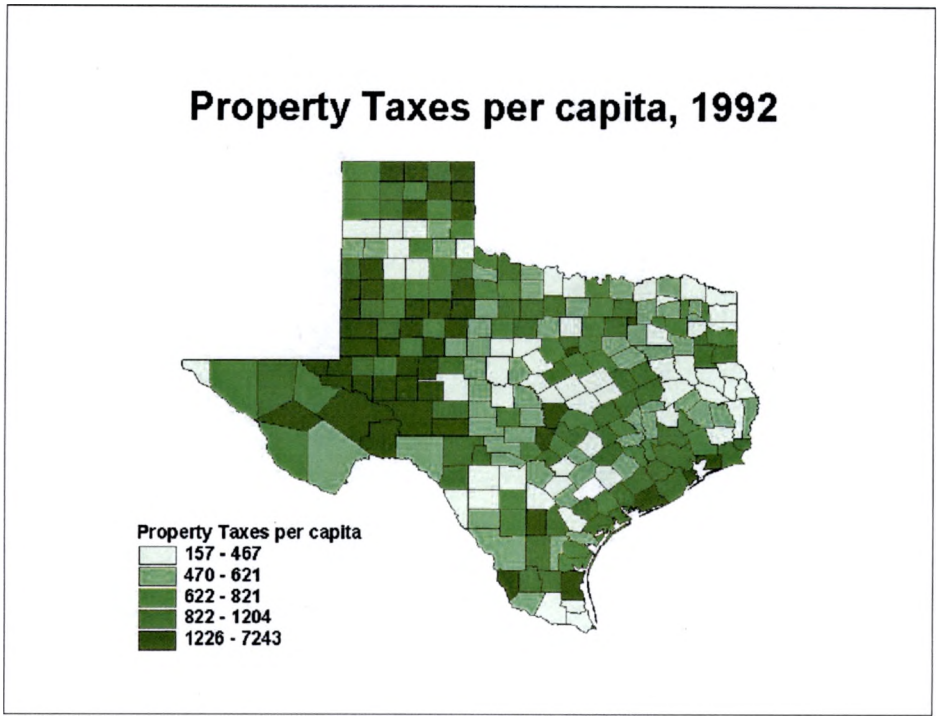


Fig. 5: Property Taxes per capita, 1992



Employment is a major concern for working-age migrants (Long and Hansen 1979; Clark and Hunter 1992; Halseth 1999; Svart 1976). Percent unemployed 1995-2000 was determined by the U.S. Bureau of Labor Statistics (Campbell 2002). Since unemployment rates fluctuate greatly, data prior to 1995 may not be indicative of migration during 1995-2000. Therefore, 1995-2000 data was averaged to provide data for all years corresponding to the dependent variable (Figure 6).

Income was also selected to measure economic circumstances, because it represents a pull factor (Clark and Hunter 1992; Serow 1897). This study uses median household income available from the 1990 Census STF3, P53 (Figure 7).

Fig. 6: Unemployment Rates

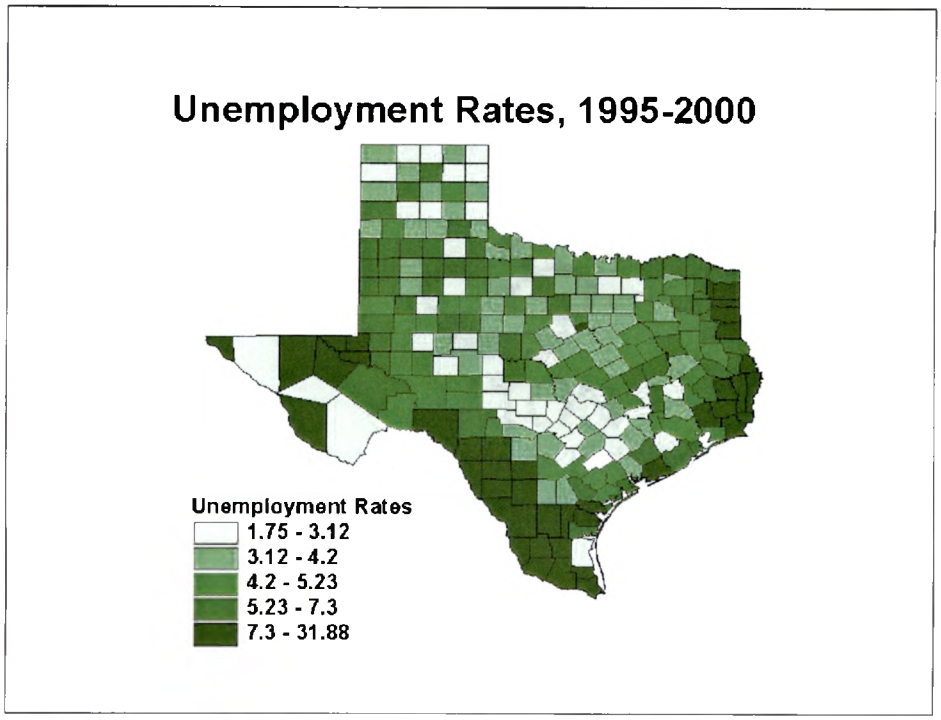
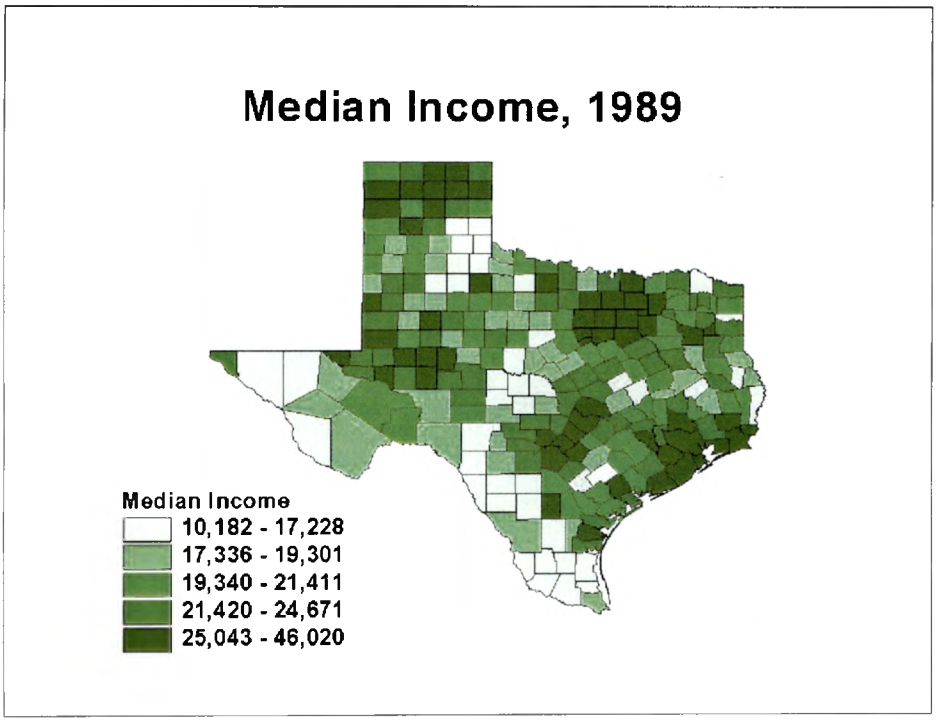


Fig. 7: Median Household Income, 1989

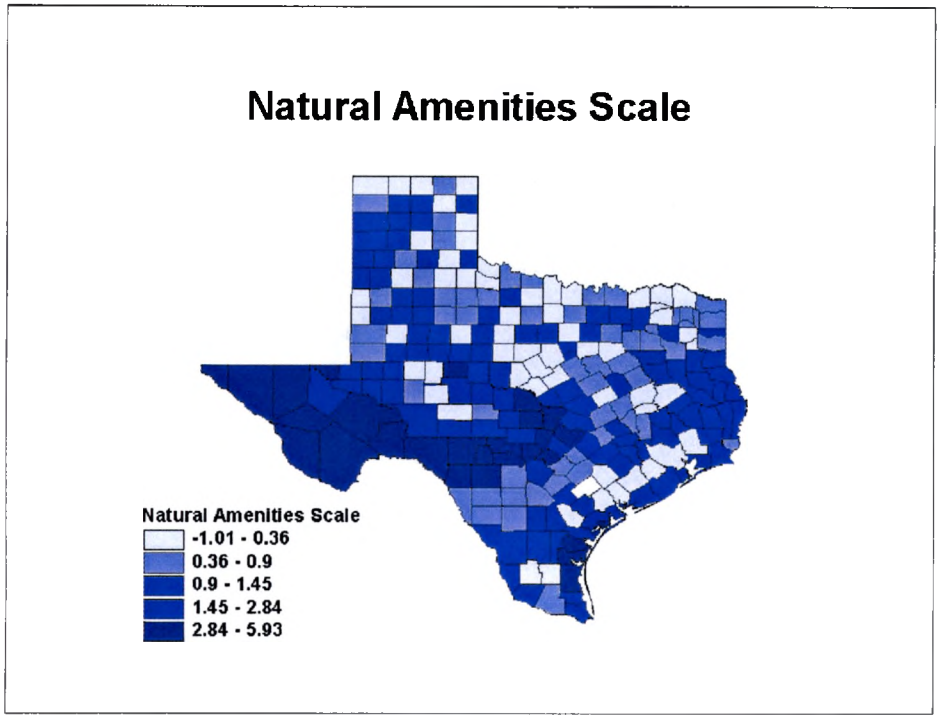


Amenity Variables

One environmental and two service amenity variables were used to measure the significance of amenities in migration decisions: the natural amenity scale, amusement and recreation services, and food and accommodation establishments.

Perhaps more research has investigated climate as a motivation for migration; indeed, mild winters have been a major factor in migration decisions (Chevan and Fischer 1979; Fournier et al. 1988a; Fournier et al. 1988b; Frey, Liaw, and Lin 2000; Jackson and Day 1993; Long and Hansen 1979; Serow et al. 1986; Svart 1976; Walters 1994). Recreational water is another significant environmental attraction in determining in-migration (Clark and Hunter 1992; Jackson and Day 1993; Pampel et al. 1984; Serow 2001; and Svart 1976). Further, environmental amenities, primarily natural beauty, can draw migrants (Carlson et al. 1998; Shumway and Otterstrom 2001). The Natural Amenities Scale, developed by the USDA, is used to measure environmental attractors (Figure 8). This scale includes four climatic measures (warm winter, winter sun, temperate summer, and summer humidity), a measure of typographic variation, and water area (lakes and coastal regions).

Fig. 8: Natural Amenities Scale



Service amenities were calculated using the 1992 Economic Census. Two variables are used including: 1) food and accommodation establishments (Figure 9), and 2) amusement and recreation establishments per county (Figure 10). These variables act as surrogates for the attractiveness of each county. The natural log of each these variables is used to decrease the importance of extremely large numbers of service establishments. Previous studies on migration have used surveys to determine the attraction of services (Carlson et al. 1998) or used data at the MSA-level (Clark and Hunter 1992).

Fig. 9: Food and Accommodations, 1992

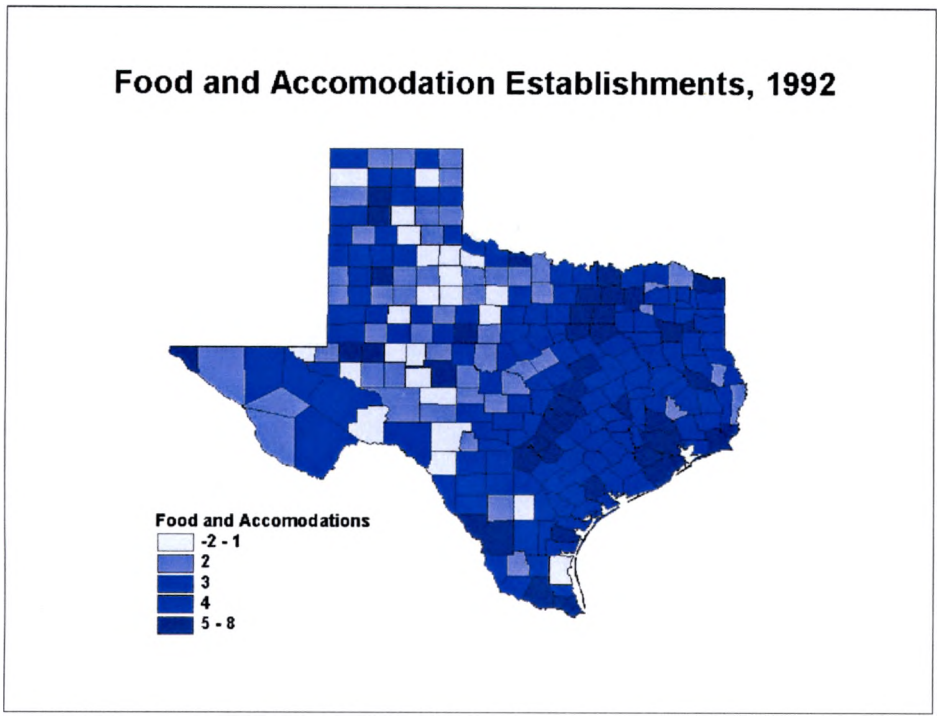
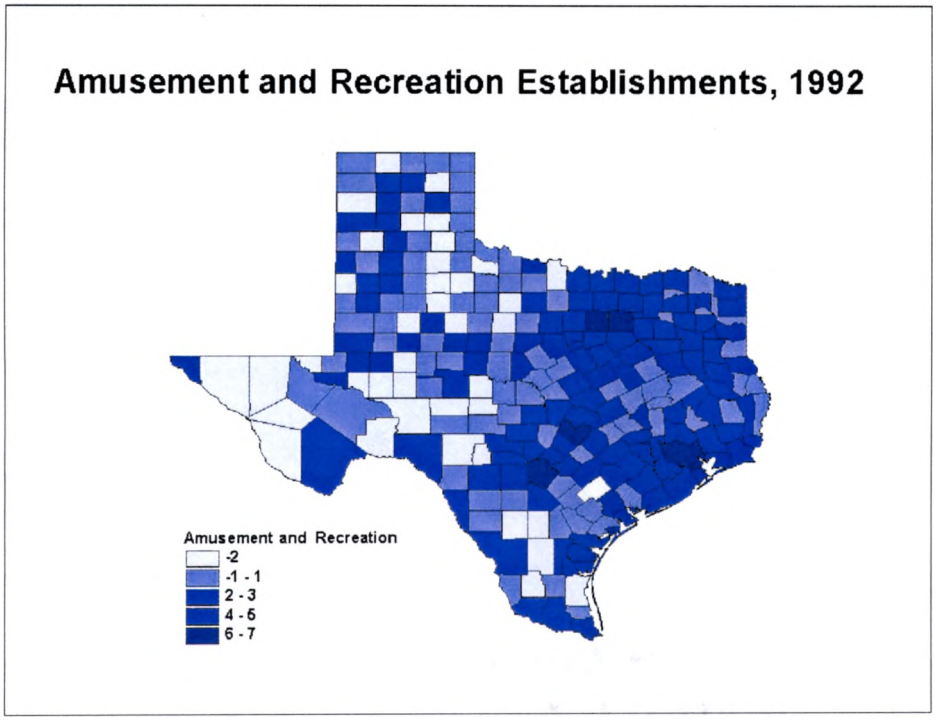


Fig. 10: Amusement and Recreation Establishments, 1992



Discussion of Variables

Although my independent variables are hypothetically "independent," it is important to remember that many variables that influence migration are interrelated. Therefore, it is impossible to completely separate the influences in a macro-level study. For example, although amenity-rich areas commonly have higher in-migration flows, it is important to proceed cautiously, because amenities are not exclusive of economic considerations. The tourist industry is drawn to amenity-rich areas, thus creating employment. Also, rural communities perceived to have only amenities, may also have employment opportunities. For example, residents in three rural communities in British Columbia's interior were surveyed to establish their reasons for migrating to that location. Almost seventy percent of the residents identified economic or employment reasons as their rationale for choosing their community (Halseth 1999). Also, industry has been brought to the sunbelt, creating employment possibilities and attracting migrants (Biggar 1979). It is not possible to understand whether it was climate, the jobs, or a combination of the two that drew the migrants, perhaps creating problems of multicollinearity. However, in this study, stepwise regression will aid in singling out the separate and relative importance of each determinant of migration.

VII. RESULTS

The dependent variable and eight independent variables: median housing value, property taxes per capita, median income, unemployment rate, natural amenities scale, food and accommodations establishments, recreation and amusement establishments, and MSA counties were entered into SPSS for the first stepwise regression analysis. Following an initial low R^2, the first model was revised. In all three separate analyses were conducted.

Analysis with all Texas Counties

The first analysis, which included all 254 counties of Texas, explained about 40% of the variation of in-migration into Texas counties (Table 2). The first variable that entered the model was food and accommodation establishments, explaining over a third of the variation. Median income and property taxes per capita were the only other significant variables. Reviewing the standard coefficients (beta values) property taxes per capita exhibited slightly more explanatory power, however food and accommodation establishments was definitely the strongest predictor. All three variables have positive associations with the dependent variable, although it was hypothesized that property taxes per capita would have a negative relationship. Perhaps this suggests that areas with

higher property taxes represent "nicer" areas with increased amenities. Retiree migration destinations have been associated with higher property taxes (Serow 2001)

Table 2: Stepwise Regression Results of In-migration with all Texas Counties

Model	R	Adjusted R Square	Standardized Coefficients (Beta)	t	Sig.
1 Food and Accommodations	.613	.374	.642	10.257	.000
2 Median Income	.664	.437	.180	3.142	.002
3 Property Taxes per Capita	.680	.456	.191	3.135	.002

Analysis with Restricted Universe and Educational Variables

In order to better explain Texas in-migration several changes were made to the data set and additional variables were added. First, the universe was restricted to eliminate the statistically volatile. All counties with populations less than one thousand were eliminated from the data set. These small counties were removed because their values can be highly unstable. For example, in Loving County the unemployment rate can be greatly altered by a change in the status of a few workers. In total seven counties were eliminated (Table 3).

Table 3: Eliminated Counties

County	2000 Population
Borden	749
Kenedy	414
Kent	859
King	356
Loving	67
McMullen	851
Roberts	887

Next, the remaining residual counties were mapped in order to suggest new variables with explanatory power. However, no discernible geographic patterns or commonalities were revealed in order to add new geographic variables. Yet this allows for confidence that this model meets the regression assumption that the residuals are spatially random.

On closer inspection, five of these residual counties (Brazos, Ector, El Paso, Walker, and Wood) were found to contain at least one university or college. A dummy variable measuring the presence of a university or college was added to the analysis (Figure 11). The presence of a university or college fits well into my conceptual model as an amenity variable. Universities, especially larger ones, provide citizens with recreational and cultural opportunities. In Sweden, university towns attract a greater number of migrants, especially the more educated migrants (Nilsson 2000). Therefore, the percent of people over 25 with a Bachelor's Degree in 1990 was also added to the analysis (U.S. Census Bureau, STF 3). This variable, similar to MSA counties, is outside the conceptual framework and is included as a social variable (Figure 12).

Fig. 11: Presence of a University

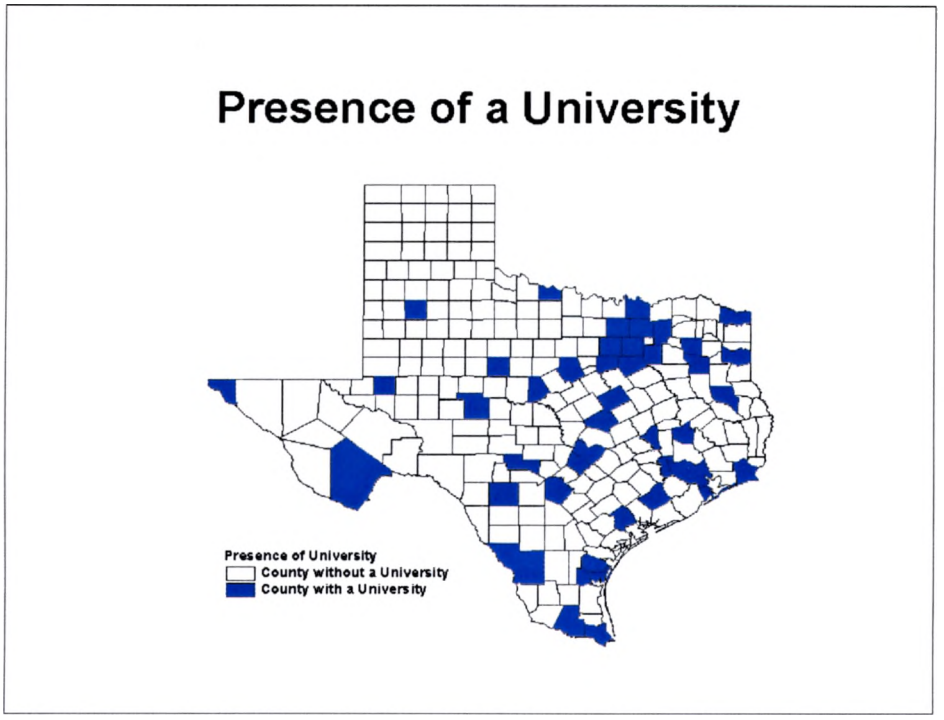
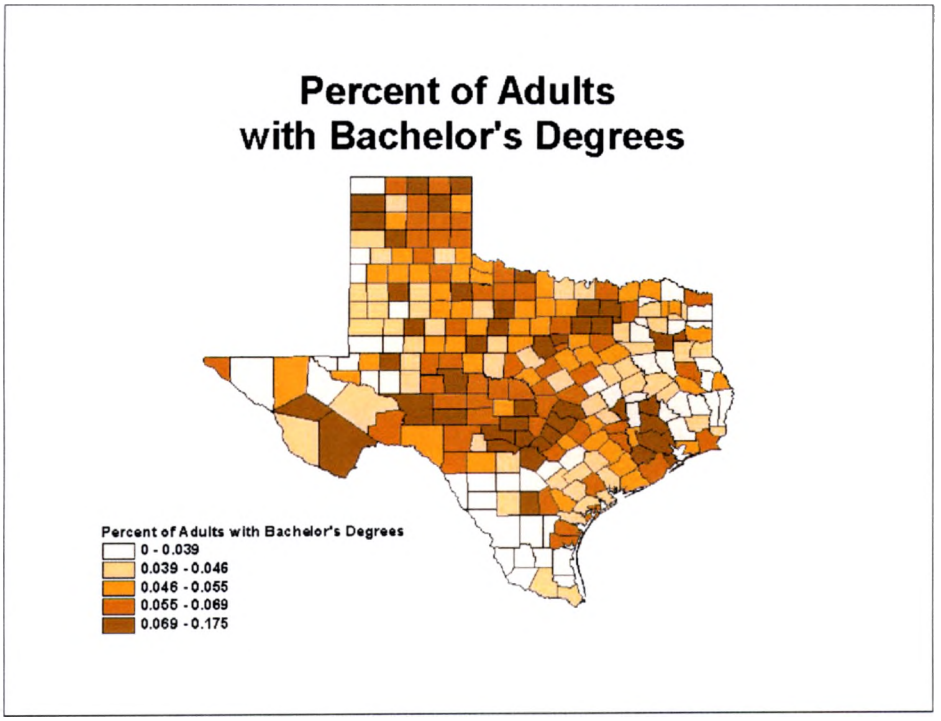


Fig. 12: Bachelor's Degrees per capita, 1990



The second stepwise regression was conducted using the restricted data set (247 counties), the dependent variable, and ten independent variables: median housing value, property taxes per capita, median income, unemployment rate, natural amenities scale, food and accommodations establishments, recreation and amusement establishments, MSA county, presence of university, and percent of population with a Bachelor's degree.

This new analysis explained over 50% of the variation, a final adjusted R^2 of .539 (Table 4). Two variables entered the analysis in the following order: food and accommodations and Bachelor's degree. Food and accommodations is also the strongest explanatory factor, having the highest beta value. The F statistic, or goodness of fit test, for this model is significant at the .0001 level.

Table 4: Stepwise Regression Results of In-migration
with Restricted Universe and Educational Variables

Model	R	Adjusted R Square	Standardized Coefficients (Beta)	t	Sig.	F	Sig.
1 Food and Accommodations	.665	.440	.527	11.158	.0001	194.009	.0001
2 Bachelor's Degree	.737	.539	.347	7.343	.0001	144.915	.0001

Although the variation inflation factors (VIF) are all below five, Pearson correlations revealed some multicollinearity in this model, which needs to be explained. Stepwise regression reduces issues associated with closely correlated variables since only variables with independent explanatory power are included. Nonetheless, it is still important to be aware of correlated variables (Table 5).

Food and accommodations are highly correlated with recreation and amusement establishments (.888), certainly accounting for why recreation and amusement does not enter the final model. The entering variable can thus be seen as accounting for many different facets of the service industry. Median income, median housing value, and the percent of the population with a Bachelor's degree all represent different socio-economic characteristics, yet are closely correlated (over .6). Since education, a social variable, is closely related to the income and housing variables, which are inside the original theoretical framework of this study, a third analysis eliminating the education variable and using the restricted universe was conducted.

Table 5: Pearsonian Correlation of Coefficients with Restricted Universe and Educational Variables

	Total Migration	Unemployment Rate	Median Income	Median Housing Value	Property Tax per capita	MSA	Bachelor's degree	Natural Amenity Scale	Recreation and Amusement	Food and Accommodation	University
Total Migration	1.000	-.096	.465	.527	-.037	.506	.557	.109	.554	.665	479
Unemployment Rate	-.096	1.000	-.380	-.320	-.085	-.062	-.415	.368	-.007	.051	-.033
Median Income	.465	-.380	1.000	.804	.273	.559	.638	-.108	.470	.449	.284
Median Housing Value	.527	-.320	.804	1.000	.015	.610	.704	.133	.632	614	446
Property Tax per capita	-.037	-.085	.273	.015	1.000	-.148	.083	-.115	-.286	-.274	-.170
MSA	.506	-.062	.559	.610	-.148	1.000	.433	.196	.640	.694	.591
Bachelor's degree	.557	-.415	.638	.704	.083	.433	1 000	-.138	.330	.399	.381
Natural Amenity Scale	.109	.368	-.108	.133	-.115	.196	-.138	1.000	.262	.280	.164
Recreation and Amusement	.554	-.007	.470	.632	-.286	.640	.330	.262	1.000	.888	.560
Food and Accommodation	.665	.051	.449	.614	-.274	.694	.399	.280	.888	1.000	.652
University	.479	-.033	.284	.446	-.170	.591	.381	.164	.560	.652	1.000

Analysis of Restricted Universe and Excluding Percent of Adults with Bachelor's Degrees and Recreation and Amusement Establishments

This final analysis excluded the percent of adults with a Bachelor's degree and the recreation and amusement establishments as independent variables for several reasons. The Bachelor's degree variable is highly correlated with income and median housing

value. Further, education is a social variable and falls outside the stated framework of this research. The recreation and amusement establishments variable was eliminated from the analysis due to its high correlation (Pearson correlation of .888). This final analysis used the 247 Texas county data set and examined the relationship between total migration and the following dependent variables: median housing value, property taxes per capita, median income, unemployment rate, natural amenities scale, food and accommodations establishments, MSA county, and presence of a university.

The total variance explained was slightly less than the previous analysis (R^2 =.473) (Table 6). Again only two variables entered into this analysis: food and accommodations and median income. Since median income was not a significant variable in the second analysis and was closely correlated with education, it acts as a surrogate for education in this model. When variables are closely correlated in a stepwise regression model, the statistical model can not always discern which is the more important variable. Although this diminishes problems with multicollinearity in the final model, it can often eliminate a variable with explanatory power. When one of the correlated variables is removed from the analysis, the related variable will often enter the model.

Table 6: Stepwise Regression Results of In-migration Excluding Percent of Adults with a Bachelor's Degree and Recreation and Amusement Establishments

Model	R	Adjusted R Square	Standardized Coefficients (Beta)	t	Sig.	F	Sig.
1 Food and Accommodations	.665	.440	.571	11.018	.000	194.009	.000
2 Median Income	.691	.473	.209	4.034	.000	111.191	.000

Both of these variables have a positive relationship with the dependent variable, as hypothesized. As in the second analysis food and accommodations explain over 40% of the variance and is the strongest predictor of in-migration. This model also has a significant F statistic.

Summary of Results

The second and third analyses reveal that service amenities, in particular food and accommodations, appear to be the most statistically significant and strongest predictor of in-migration. The percent of the population with a Bachelor's degree, a social variable, also strongly explains why people move. Economics also do play a role in migration destinations by suggesting that people are more likely to move to more affluent areas, where a higher income may be generated.

VIII. CONTRIBUTIONS TO OUR UNDERSTANDING OF MIGRATION

During the last two and a half decades migration research has considered elderly migration as well as the attraction of economic opportunities and amenities, particularly climate. Somewhat less research has looked at both economic and amenity factors for the working-age and total population (Clark and Hunter 1992). Although Clark and Hunter (1992) studied the effects of over fifty variables, their work is dated and was limited to white males migrating between 1970 and 1980. This study includes the total population of a very large and rapidly growing state, Texas, with eight to ten independent variables carefully selected to determine the most significant reasons for recent migration. Further, this analysis allows a better understanding of the reasons underlying population growth in different parts of Texas.

By revealing that service amenities are the most significant determinants of migration into Texas, counties that are interested in attracting migrants may foster these amenities to improve growth. Although all areas may not be interested in population growth, in-migration can increase area service use, income, jobs, and the visibility of many businesses. A study in non-metropolitan areas in the Middle Atlantic region compared elderly longer-term residents with in-migrants and found that in-migrants are more likely to utilize public parks and recreation services and cultural programs, including museums and libraries, than previous residents (Glasgow 1995). In the Texas

Hill Country counties with higher growth rates,attributed to retirement migration, were associated with rapid growth of service establishments, perhaps signifying that retirees purchase a noteable amount of goods locally (Day and Bartlett 2000).

Migrants who moved between 1993-94 had an aggregated income over eighty-four billion dollars (Plane 1999). Between 1992 and 1995, over fifty percent of nonmetropolitan counties experienced increased per capita income caused by migration (Cromartie and Nord 1997). Our mobile population indeed has economic clout.

Lastly as SF3 for the 2000 Population Census was only released this past fall, this may be one of the first studies to analyze determinants of recent Texas migration. This research has revealed that service amenities, and to a lesser extent social and economic factors, are significant determinants of migration, hopefully stimulating even more research into why people move.

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VITA

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