Technology, Age Effects, and the Homogenization of US Metropolitan Areas: 1970-2000

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Historically, technological innovations have had a direct influence on the pattern and pace of urban development, most notably in the development and implementation of new transport mechanisms. Borchert (1967) identifies four historical phases in which technological developments correspond to a level of urban change and development: (1) Sail-Wagon, 1790-1830; (2) Steamboat and Iron Horse, 1830-1870; (3) Steel Rail, 1870-1920; (4) Auto-Air-Amenity, 1920-. These phases each concern the opening of additional frontiers for potential settlement through new transportation mechanisms: canals and steamboats, railroads and highways. The invention of air conditioning also allowed for settlement in previously inhabitable areas.

Technological developments in the last few decades clearly differ from those that Borchert discusses in that there are no new frontiers to discover in the United States (Farley 1998). Yet the following study examines the extent to recent technological innovations, including the rise of the computer and telecommunications industries, continue the historical legacy of technology and urban development.

Studies such as Kotkin (2000) and Florida (2002) have discussed the potential for the digital revolution to reshape the American landscape, and both theorize that quality of life will become increasingly important as the role of physical factors diminishes. Yet while these works have been largely theoretical, this study aims to build an empirical test of the relationship between internal migration, employment change, and quality of life.

The empirical test of this relationship starts with the premise that computer and telecommunications technologies potentially affect migrants' decisions in two ways: they can create more flexibility for where people and industries choose to settle, and they can affect the economic situation of particular areas, thus influencing the relative pull factor for migrants.

This investigation examines the influence of technological innovations on migration over the time frame 1970-2000 through three particular types of industries: high technology, manufacturing and finance. Building on the work of Saskia Sassen (1991), I argue that computer and telecommunications innovations have directly influenced each of these industries. Firstly there is the direct effect in which more individuals have high technology occupations, secondly these developments decreased the relative locational advantage of some areas and facilitated the shift of manufacturing jobs both within and beyond US borders, and lastly, an increased need for management in a globalized economy shaped the rise in the finance industry (Sassen 1991).

Looking at a sample of 98 metropolitan areas (MSAs) in three separate time-periods: 1970-1980, 1980-1990 and 1990-2000, I examine whether the MSA's proportion of employment in each of these industries affects in-migration rates. I hypothesize that comparatively high initial proportions of employment in manufacturing would inhibit future in-migration when these industries are contracting. In contrast, high initial proportions of high technology or finance jobs should draw in-migrants in a period in which these industries are expanding. Additionally, since changes in these industries are induced by technological progress between 1970-2000, the relationship between these industries and internal migration is affected by technological innovation.

PREVIOUS STUDIES:

In The Global City (1991), Saskia Sassen provides a theoretical framework of globalization and its effects on the economic function of cities, specifically New York, London and Tokyo. She examines the process by which a city becomes 'global'. The process, she argues, is facilitated by recent developments in computer and telecommunications technology and their applications. She outlines three intertwined hypotheses: first, the geographic dispersal of manufacturing and the decline of industrial centers has created a demand for central management and specialized services that are key components of growth in global cities, second the growth of the financial industry (a specialized service) has benefited from policies that were harmful to industrial manufacturing; and lastly these first two changes have transformed the economic relationships among the global cities.

The following study draws upon the first two theories by arguing that technological developments have influenced the distribution of the nation's population, through a medium of industrial change. This study builds on these ideas by not merely examining global cities, but by examining how these technological transformations pertain to a larger sample of cities, specifically the largest 98 metropolitan areas in the continental United States.

Several studies discuss technology's influence on city location, but these studies are largely theoretical. For instance, Joel Kotkin's *The New Geography* (2000) discusses the decline in the need for cities to be concentrated near physical factors –such as access to raw materials and ports- and argues that over time 'there will be a greater emphasis on the concentration of human skills in dense concentrations of populations'. [1] He additionally contends that as technology frees us from the 'tyranny of place', quality of life factors will grow ever more important in the choice of city locations.

Richard Florida's *The Rise of the Creative Class* (2002) also emphasizes the importance of quality of life factors in 'the new regime of geography'. He argues that cities have

[1] Joel Kotkin, The New Geography: How the Digital Revolution is Reshaping the American Landscape, (New York: Random House 2000) 5.

survived because creative people want to live there. In a chapter entitled 'Technology, Talent & Tolerance' he notes that the same places that were popular among gays were also the ones where the high tech industry located. He contends that technology has allowed society to become more occupationally creative, and further that high technology centers represent such outlets for creativity.

Both Kotkin and Florida present similar arguments about why cities remain viable, and both predict that similar quality of life factors will become increasingly important. Sassen also discusses the changing nature of cities and changing employment distribution. These studies form the theoretical basis for my empirical analysis of industrial change and population shifts within the United States.

Metropolitan areas lose population to out migration and gain from in-migration. Yet, it is however in-migration that determines an MSAs net migration rates in my sample. As in-migration revealed a higher variation within the sample of MSAs for the purposes of this study I assume that out is roughly constant across areas, as the classic text by Hoover (1971) summarizes:

> [T]he observed net migration losses of depressed areas generally reflect low in-migration but not high out-migration, and the net migration gains of prosperous areas reflect high in-migration rather than low out-migration… Areas with a high proportion of well-educated young adults have high rates of out-migration regardless of local opportunity. The pull factor (that is, the migrant's choice of where to go) is, however, primarily a matter of the economic characteristics of areas.[2] (Hoover 1971)

Hoover's conclusion clearly apply to the MSAs within this time period for in migration is highly correlated with net migration, at .95, .88 and .90 for the three time periods. Out-migration was also positively correlated with net migration at .32, .40 and .39 for the three time periods.

[2] Edgar M. Hoover, An Introduction to Regional Economics, (New York: H. Wolff Book Mfg. Co., Inc., 1971) 171.

Historic employment changes affect the distribution of the population in the United States. As the U.S. economy shifted from an agricultural to a non-agricultural base, the population flowed from rural to urban areas (Eldridge and Thomas 1964). Stanback and Noyelle (1982), note the rise of the service economy in the United States and the relative decline in manufacturing, in: Atlanta, Denver, Buffalo, Phoenix, Columbus, Nashville and Charlotte. They conclude that the industrial transformation of the United States that occurred between 1960-1980 led to the rise of the Sunbelt's[3] population. They also predicted that manufacturing would move abroad while service industries would rise in the United States. Stanback and Noyelle argued that although the Northern cities can shift into high-level service centers, they would have to incur losses in their manufacturing employment that cities in the South and West would not. This observation suggests that the Sunbelt cities would have a comparative advantage in service, finance, high technology and other emerging industries.

Recent studies, however, reveal that growth in the manufacturing industry occurred disproportionately in the Sunbelt. "Pull" factors that lead to employment growth may vary systematically across regions. Greenwood and Hunt (1984) use time series data to show that incremental employment opportunities are more attractive to migrants if they occur in Southern and Western areas. Kasarda (1995) provides descriptive evidence that demonstrates that employment growth disproportionately occurred in the Southern and Western regions in the period 1980-1990. He reports that between 1980 and 1990 the Frostbelt (Northeast and Midwest census regions) lost 1.5 million manufacturing jobs and $40 billion (in 1989 dollars) in aggregate manufacturing worker earnings, whereas the

[3] Standard definitions of the Sunbelt include: Alabama, Georgia, Arkansas, Missouri, Mississippi, Louisiana, New Mexico, North Carolina, South Carolina, Oklahoma, Tennessee and Texas. (Ballard and James 1983). For the purposes of this study I would also like to include Arizona, Utah and Nevada.

Sunbelt (South and West) added 450,000 manufacturing jobs and gained $21 billion in manufacturing worker earnings. Kasarda also reviews explanations for redistribution of manufacturing jobs based on by favorable business climates such as limited unionization and lower labor costs, which are associated with the Southern and Western regions.

Increases in manufacturing in the Sunbelt, and decreases in the Frostbelt arise from to the diminished importance of transport modes and raw materials (Stanback and Noyelle 1982), which is largely technologically driven. The strategic importance of manufacturing plants near large markets to which the goods could easily be transported declined along with the cost of transportation. Thus the manufacturing industry can prosper in more geographic locations, both domestically and abroad.

In the 1980s, after a decade of population growth in non-metropolitan areas, many studies predicted that cities and urban life would decline in the future (e.g. Johnson et al. 1981, Frey 1987). Frey presents theories suggesting that changes in production and industrial composition have decreased the necessity for cities and that:

> [L]ongstanding worker and employer preferences toward lower density residential and workplace locations are becoming less constrained by institutional and technological barriers and that the post-1970 counterurbanization tendencies represent the beginning of a long-term shift toward a more diffuse urbanization process. [4]

Such theories of urban decline were largely abandoned when the 1990 US Census data revealed that MSAs had in fact grown between 1980 and 1990. Yet, recent MSA growth has been concentrated in areas in Sunbelt MSAs with relatively low population densities, which may represent areas with high 'quality of life'. Kasarda and others also note that metropolitan areas captured nearly 90 percent of the nation's employment growth between 1980 and 1990 and that much of this growth occurred in booming 'Edge Cities' at the

[4] William H. Frey, "Migration and Depopulation of the Metropolis: Regional Restructuring or Rural Renaissance?" *American Sociological Review* 52 (1987): 241.

metropolitan periphery. Although many of these MSAs have large populations, the low population densities in 'Edge Cities' and in many Southern and Western cities may provide a sense of balance between the vitality of the city and the amenities of the suburbs.

Building on Sassen's theories of changing roles of cities arising from global processes, and Kotkin and Florida's theories about the role of quality of life in a new age of geography, this study examines the post-Industrial Metropolis period (1970-2000) defined by Brian Berry in "The Technological Reshaping of Metropolitan America". The study uses these theories to guide the empirical test of the relationship between age-specific in-migration and employment distribution within 98 metropolitan areas that represent the largest cities in the United States in 1970.

DATA AND METHODS:

This study uses the Public Use Micro-data Sample (PUMS) from the United States Census from 1970, 1980, 1990 and 2000. The units of analysis are MSAs. Since these units have changed substantially over this thirty-year period I have standardized these MSAs, where possible, to the geographic borders of the CMSAs used by the 1990 census; the appendix includes a description of these borders. This standardization made it possible to calculate population growth within a consistent geographical region, rather than confusing that growth with population growth due to expanding borders.

The sample of MSAs represent the largest 98 metropolitan areas in 1970, which Table 1 lists by region. The 98 MSAs are distributed across the following regions: Midwest (N=23), Northeast (N=23) and West (N=20), the South (N=16) and South Atlantic (N=16). The South Atlantic is separated from the rest of the South since it experienced a distinct pattern of growth, particularly between 1980-1990, and because it had a substantial number of MSAs.

This study uses the census question that asks for geographic residence five-years prior to the census date to examine age-specific (i.e. 18-24, 25-34, 35-44, 45-59, and 60 and over) in-migration into each metropolitan area.

The age-specific in-migration rate is the number of individuals in the age category who migrated to the MSA in the past five years, divided by my estimate of the age-specific population within the MSA five years earlier. These measures are not annualized, which would be difficult to calculate since individuals move in and out of an MSA within the 5 year period. Thus these measures represent a proxy for overall growth due to in-migration during the five year interval.

The measures of economic attractiveness include: the percentage of employed population of MSA in high technology, manufacturing and finance jobs at the start of the decennial interval. Employment is measured prior to the period of migration to prevent the possibility of a bi-causal relationship such that migration is a function of employment characteristics rather than employment being a function of migration.

To measure MSA employment in High Tech, Manufacturing and Finance jobs, I use occupational rather than industry data. Occupational data provide more accurate indices of the number of people whose occupations actually involve high technology applications or finance or goods production, rather than administrative and other services within a high technology company. While most previous studies have used industry data to assess employment changes within cities, industry data are particularly poor measures of high technology jobs which exist in small numbers throughout many industries, as several recent studies have noted (e.g. Chapple et al. 2004). The occupational distribution of the individual MSAs are derived from the Censuses' detailed occupational codes that categorize approximately 31,000 job titles into 1000 job codes. High technology occupations include: computer programmers and technicians, engineers, and biomedical researchers. Manufacturing occupations include all jobs involved in the direct production of goods. Lastly, finance occupations consist of accountants and auditors, credit men, bookkeepers, collectors, bill and account, insurance agents and brokers, real estate agents and brokers and stock and bond salesmen.[5] The occupational data for finance and manufacturing come from the Censuses' standardized 1950 occupation codes to ensure consistency of occupational codes across the three time periods.

The analyses also investigate other factors that may affect the attractiveness of a particular metropolitan area to potential migrants. These variables include: census region, whether the MSA is located on a coast, mean July temperatures (1970-2000), and the proportion of the population that is aged 18-24 and that is above age 65. The age and the occupational variables are measured prior to the period of migration. The regional, coastal and temperature variables are proxies of quality of life characteristics.[6] Age-specific migration rates allow consideration of how age indicates the effects of economic or amenity attractors, and allows us to evaluate whether migrants are moving to retirement areas that individuals.

I regress the subsequent in-migration to the MSA on all the independent variables measured at the start of the interval on the subsequent in-migration to the MSA. The fact that both age and employment distribution are measured before the period of migration prevents me from capturing reverse causation. The first series of models looks at all

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[5] I have also analyzed service occupations consisting of a variety of health, personal and educational services. These occupations do not reveal a high degree of variation across the sample of metropolitan areas, however, so I do not report those results here.

6 I also modeled population density, January temperate and racial characteristics of the MSAs. Density increased over the period, although did not add to the explanatory power of the model and was not significant. January temperatures did not add any additional information than was captured by July temperatures. Racial distribution in the MSA was highly correlated with employment characteristics, largely manufacturing, and would have to be analyzed in a separate paper.

migrants recorded by the census, while the second series excludes international migrants to examine the relationship between domestic and international migration. The second series also incorporates a dummy variable for cities over 750,000 since larger cities may be expected to grow at slower rates.

Additionally several nested models that focus solely on the influence of: 1) occupational distribution, 2) age patterns and 3) regional variables are presented. The model for occupational distribution regressed on migration is particularly important since it illustrates the influence of occupation distribution separate from other factors. [7]

DESCRIPTIVE RESULTS:

Table 2 provides the means and standard deviations for the age-specific in-migration variables. As expected, in-migration rates are highest for the youngest two age categories (18-24 and 25-34) in all three time periods 1975-1980, 1985-1990 and 1995-2000. Yet more surprisingly, there is a steady drop in in-migration among young movers across the 1970 to 2000 period: 45% of the 25-34 year old population had moved into their MSA in the 1975 to 1980 period, falling to 34% in the 1985-1990 period and to 31% in the 1995-2000 period. The age 18-24 category revealed a similar time pattern while the mean values for most other age groups, in addition to being substantially lower, remained fairly constant. One striking pattern across all age groups is that the standard deviations of in-migration rates grew smaller in each period: 1975-1985 saw the most variation in the rates of in-migration, and 1995-2000 the least. The rates of in-migration converged for these MSAs. Even among age groups in which the likelihood of moving did not change substantially, the choice of destination appears to have become more evenly distributed in the later periods.

[7] I also constructed parallel models that looked at the rate of population growth, rather than the rate of in-migration. The results were generally the same, although the in-migration models revealed a greater level of precision.

Chart 1 displays this result graphically, by looking at all age groups to illustrate a trend toward regional convergence in in-migration rates across the periods: 1975-1980, 1985-1990 and 1995-2000. This result appears to be driven by steady declines in in-migration rates in the West, South, and South Atlantic while the rates remained roughly constant in the Midwest and Northeast. Thus the 1995-2000 period displays more similarity across regions than in either of the preceding periods. The standard deviation on in-migration rates of these MSAs grouped into these five regions illustrates this trend numerically, as they decreased from 7.62 to 5.56 to 4.03 for 1975-1980, 1985-1990 and 1995-2000, respectively. The coefficient of variation on the percentage of in-migration to the whole sample of MSAs also declined steadily over the thirty year time period, from .45 to .38 to .34 for the respective periods 1975-1980, 1985-1990 and 1995-2000. These points reveal regional convergence in the rate of in-migration into MSAs.

The independent variables in the model also experienced some notable changes across the three time periods, which are listed in table 3. Among the three occupational groups, the percentage of high technology jobs in these MSAs dramatically increased over this thirty-year time period. Within these 98 MSAs, high technology jobs represented 2.6% of all jobs in 1970 and 8.0% in the year 2000. In contrast, we see a substantial decline in manufacturing jobs, which represented 15.5% of all jobs in 1970 and 8.3% in 2000, although the 1990 figure was the low point at 7.5%.

The graphical illustration, provided in chart 2, also shows regional convergence in the proportion of the population employed in manufacturing. Manufacturing jobs declined over the time period 1970-2000, although the 2000 figures are slightly higher than the 1990 figures. Note that there are distinct regional patterns in the earlier periods: manufacturing jobs were heavily concentrated in the Midwest and Northeast in 1970, but are more evenly distributed across regions by the year 2000.[8]

In spite of regional convergence across MSAs of the percent employed in manufacturing jobs, the correlation of an MSAs proportion of manufacturing in 1970 and the proportion in 2000, was (R=.83). Additionally, in spite of the large growth in high technology jobs over the period 1970 to 2000, metropolitan areas with the highest proportion of high technology jobs in 1970 also had the highest proportions in 2000 with a correlation of .74. Finance shows somewhat more fluctuation across the thirty-year period, but any twenty-year period is correlated above .70. The 2000 data is not actually included in the regression models, because it may be endogenous with the period of previous migration, but these data help examine the trend in employment distribution over time.

The fraction of all migrants who came from abroad to these MSAs increased from 10% to 15% between the 1975-1980 and 1995-2000. As the coefficient of variation of this statistic is much lower in the 1995-2000 period than in the two preceding periods, international migrants became more evenly spread out across these metropolitan areas.

Overall, the descriptive statistics suggest that there were fewer regional disparities by the end of the period.

REGRESSION RESULTS:

Tables 4, 5 and 6 contain the main results from the age-specific in-migration regression models, each for a separate time period: 1975-1980, 1985-1990 and 1995-2000. The individual tables (4, 5 and 6) reveal distinct age patterns in in-migration rates in each period so that we can examine how occupational distribution influences in-migration across the age groups 18-24, 25-34, 35-44, 45-59 and for comparative purposes - 60 and over. The

[8] This finding fits with Kasarda's observations that the number of manufacturing jobs declined in the Frostbelt, but grew in Sunbelt over the period 1980-1990.

comparison of tables 4, 5 and 6 illustrates period differences in the age-specific pattern of in-migration.

Beginning with table 4, we see that younger migrants (18-24) & (25-34) are likely to be drawn to high technology centers, controlling for other factors. This effect declines across older age groups, except for retirement migrants (over 60). These results are consistent with the idea that new hires in high technology industries are likely to be young. The high technology coefficient may be both fairly large and statistically significant for individuals over 60, because technology centers, which have the freedom to 'settle' anywhere, may locate in areas with desirable quality of life factors that are also appealing to retirement migrants.

Higher proportions of manufacturing jobs are negatively correlated with in-migration of individuals 25-34, 35-44 and 44-59 in this period. The comparatively low coefficients on these values mask the fact that the proportion of manufacturing is actually quite high a mean value of 15.5% in 1970 compared to only 2.6% for high technology jobs. Thus manufacturing centers repelled in-migration in this period. Finance centers appear to draw individuals aged 18-24.

The dummy variables on region show that in the 1975-1980 period, the West is the most popular region among all age groups, and has an even stronger effect for younger migrants. The South and the South Atlantic, (the omitted region) are not statistically different at younger ages (under 45) while the Midwest and Northeast are the least popular destinations among all age groups.

The age variables also reveal an interesting trend in that younger migrants are more drawn to places with a high proportion of younger residents, while migrants of all age groups are drawn to places with a high proportion of older residents. The fact that all migrants are drawn to metropolitan areas that have high proportions of individuals over age 60 suggests that the quality of life factors that are appealing to retirement individuals are also appealing to migrants of other ages.

One other intriguing result that occurs though out the models is a negative sign on the dummy variable for whether a city is located on a coast. While not highly significant in any of the models, this value is likely the result of the fact that many larger cities are on the coast and tend to grow slower. For instance Las Vegas had a higher in-migration rate than Los Angeles. While I weight the regression by population size, I more fully control for this effect in later versions of my model.

The identical model for the period 1985-1990 (table 5) reveals many of the same patterns of age-specific in-migration on the same set of independent variables, although it also illustrates a number of period differences. High technology remains a positive pull for young migrants, although the effect declines slightly from the previous period. The largest employment story for this period lies in the finance industry, in which a high proportion of finance occupations has as a large and highly significant pull on migrants, when controlling for region. This effect is strongest for younger migrants.

These findings are consistent with younger individuals being most attracted by employment as they are beginning their careers and presumably have fewer established ties to their current residence. The time period includes the finance boom of the early 1980s, and the restructuring of the finance industry that Sassen outlines. The fact that the manufacturing is no longer significant, when controlling for region, is also notable since it was such a large deterrent to migration in the previous period.

There are also a number of regional changes in the 1985-1990 period, as the South Atlantic became the most popular destination for migrants under age 45. This result would relate to the population boom around Atlanta and throughout the South Atlantic that began in this time period.

The age effects in this period are largely consistent with those in the earlier period, yet high proportions of young residents in an MSA serve as a positive pull for not just young migrants, but migrants of all age groups. A high proportion of older individuals in an MSA also remains a positive pull for all migrants. Thus in this period perhaps all migrants are attracted to the 'creative centers' that have high proportions of younger individuals, and these migrants are also attracted to the quality of life factors that draw in retirement age populations.

In the last period, 1995-2000 (table 6) we once again see that younger individuals are most influenced by employment characteristics, although the magnitude of the coefficients on both high technology and finance declines across the age groups. The magnitude of the finance variable actually decreased from the previous period, while the magnitude of the high technology variable increased. Not only is high technology significant across all age groups, for the first time, its mean value increased substantially (from 2.8% to 4.1%) meaning the impact would be even larger.

The regional characteristics have a somewhat smaller amount of variation than in previous periods as the coefficients on Midwest and Northeast are smaller than in the previous period, while they remain negative. While still popular, the South Atlantic declined in popularity relative to the other regions.

Overall, the most notable finding from the 1995-2000 period is the decline in the explanatory power of the model. A comparison of tables 4, 5 and 6 shows that over the three periods, the same series of independent variables explains a smaller proportion of the variance in in-migration, for migrants under age 45.

To further probe the declining explanatory power of the model, the study includes a separate set of nested models are examined that test only the influence of 1) regional variables, 2) occupational variables and 3) age of MSA's population. These results are shown in tables 7, 8 and 9. These models include the age 25-34 population who respond highly to employment variables, and the over 60 population who are the least influenced by employment characteristics.

Employment conditions affect the destinations of the age 25-34 population more than for the population age 60 and over. These models do not control for regional characteristics, the relatively small response of migrants in the 60+ category is probably because of other characteristics of the MSA where the industries are concentrated. What is surprising about these models is the decline in predictive power of in-migration for individuals age 25-34, not only for the occupational variables, but also for regional and age variables, as shown in tables 7, 8 and 9.

The estimates for the population over age 60 do not show these declines; the predictive power of the occupational variables decline slightly, yet the pull associated with regional variables remains constant across the periods. As the majority of migrants are of younger ages, changes in the patterns of younger individuals have more of an effect on the MSA population distribution. The decline in the predictive power of these selected independent variables on migration of working age individuals suggests that a change occurred in the factors driving MSA growth between 1970 and 2000.

To further investigate these period differences, I estimate a model that separates the effects of international and domestic in-migrants. The results are presented in table 10. The dependent variable in this model is age-specific in-migration of domestic movers only, whereas the previous model looked at all movers to an MSA. The domestic movers include foreign born migrants if they lived in the US five years earlier. The variable for international migrants measures the fraction of in-migrants who lived outside the US five years earlier. This coefficient on this variable shows that high proportions of international migrants have a negative correlation with domestic movers into these MSAs in all periods, and the effect is stronger for younger migrants than for older migrants. The model presented in table 10 additionally includes a variable for cities over 750,000, which seemed to be a natural break in my sample of cities. This variable reveals a negative coefficient across all periods, which is expected as the population growth due to migrant flows would be proportionately smaller in larger cities. The effect of this variable declines over time for all ages. The inclusion of dummy on city size also decreases the negative effect associated with the coastal variable in earlier models.

Lastly this model tests for non-linear relationships in temperature to further probe at how quality of life variables may influence migration. The variable on temperature shows that people appear to want to live in warmer and warmer places, rather than a direct non-linear relationship in temperature. Yet the inclusion of this variable adds to the explanatory power of the model. Interestingly, this variable also influences the story on high technology, which is no longer significant in the later period. These findings potentially relate to the fact that, with the exception of Boston, high technology centers tend to locate in warmer places. Overall, the inclusion of these variables greatly increases the explanatory power of the most recent period.

Nonetheless, the comparison of the models reveals substantially period changes occupational distribution, regional characteristics, and age patterns.

CONCLUSIONS:

This study modeled the influence of industrial composition, on age-specific in-migration rates within the largest 98 metropolitan areas in 1970. The results are consistent with the hypothesis that greater concentrations of high technology and finance industries in MSAs attracted migrants. The result was strongest for young working age migrants. High concentrations of manufacturing jobs were negatively correlated with in-migration, yet the negative effect declines substantially over time. In the 1985-1990 period there was a dramatic increase in the importance of finance jobs. Finance remained a strong predictor in the 1995-2000 period for younger workers, although the effects declined. Technology jobs are significantly correlated with in-migration for young age groups (18-24) and (25-34) in all three periods, although by the 1995-2000 period high technology centers draw migrants of all age groups.

The results for occupational characteristics are consistent with the hypothesis that technology and finance centers draw migrants while manufacturing centers do not. The most dramatic finding of this study is the regional convergence of the MSAs with respect to in-migration rates, occupational composition and age structure. These results appear to be largely due to declining variance across regions both in levels of in-migration and of the occupation variables, most notably manufacturing. While manufacturing was highly concentrated in the Northeast and Midwest in 1970, by the year 2000 manufacturing jobs were more uniformly distributed across MSAs. This finding fits with the underlying theory that technological innovations have allowed individuals or industries to settle in more desirable locations, whether financially desirable or desirable in terms of quality of life.

Additionally, the age composition in these MSAs became more similar across this time period, decreasing explanatory power of these characteristics. As MSAs become increasingly similar over the 1970-2000 period, it is more difficult to for the model to explain the differences in in-migration between them.

Technological advances provided both individuals and industries more freedom to settle throughout the country. As a result of this phenomenon, we see manufacturing jobs relocated to areas that have more desirable quality of life characteristics. Thus manufacturing is only a significant deterrent to migration in the first period. Additionally, the high technology jobs, with the freedom to settle anywhere also appear to have to located in desirable areas. Thus there appears to be truth in Kotkin's argument that 'geography is not dead' yet his statement that 'place matters more than ever' is largely not supported by the results, as the results of this study show a convergence across cities. The re-distribution of population via migration associated with these occupational shifts has declined over the three periods. Migration based on occupational shifting due to the global restructuring took place in manufacturing in the 1975-1980 period and finance in the 1985-1990 period, and the overall effect of the manufacturing, finance and high technology occupations on in-migration destinations declined over time.

Occupational transformations occurred among these MSAs, so that the employment mix with respect to these three industries appears to have converged somewhat, particularly with respect to migration. Thus this study supports the hypothesis that the underlying homogenization of these MSAs is in part driven by technological innovations, as evidenced by convergence in occupational distributions and in-migration rates.

Table 1. List of Metropolitan Areas, by Region

Midwest (N=23)	Northeast (N=23)	South (N=16)	South Atlantic (N=16)	West (N=20)
Akron, OH	Albany, NY	Austin, TX	Atlanta, GA	Albuquerque, NM
Appleton, WI	Allentown, PA	Baton Rouge, LA	Augusta, GA	Bakersfield, CA
Canton, OH	Binghamton, NY	Beaumont, TX	Baltimore, MD	Denver, CO
Chicago, IL	Boston, MA	Birmingham, AL	Charleston, SC	Fresno, CA
Cincinnati, OH	Buffalo, NY	Corpus Christi, TX	Charlotte, NC	Las Vegas, NV
Cleveland, OH	Erie, PA	Dallas, TX	Columbia, SC	Los Angeles, CA
Columbus, OH	Harrisburg, PA	El Paso, TX	Fort Lauderdale, FL	Phoenix, AZ
Dayton, OH	Hartford, CT	Houston, TX	Greensboro, NC	Portland, OR
Detroit, MI	New Britain, CT	Jackson, MS	Greenville, SC	Sacramento, CA
Flint, MI	Lancaster, PA	Little Rock, AK	Jackson, MS	Salinas, CA
Fort Wayne, IN	New Haven, CT	Mobile, AL	Knoxville, TN	Salt Lake City, UT
Grand Rapids, MI	New York, NY	Nashville, TN	Miami, FL	San Diego, CA
Indianapolis, IN	Newark, NJ	New Orleans, LA	Orlando, FL	San Francisco, CA
Kansas City, MO	Philadelphia, PA	San Antonio, TX	Richmond, VA	San Jose, CA
Madison, WI	Pittsburgh, PA	Shreveport, LA	Washington, DC	Santa Barbara, CA
Milwaukee, WI	Providence, RI	Tulsa, OK	West Palm Beach, FL	Seattle, WA
Minneapolis, MN	Reading, PA			Spokane, WA
Omaha, NE	Springfield, MA			Stockton, CA
Peoria, IL	Syracuse, NY			Tacoma, WA
Rockford, IL	Trenton, NJ			Tucson, AZ
St. Louis, MO	Utica, NY			
South Bend, IN	Worcester, MA			
Wichita, KS	York, PA			

Table 2. Age-Specific In-Migration to MSAs: Means and Standard Deviations (in Parentheses)

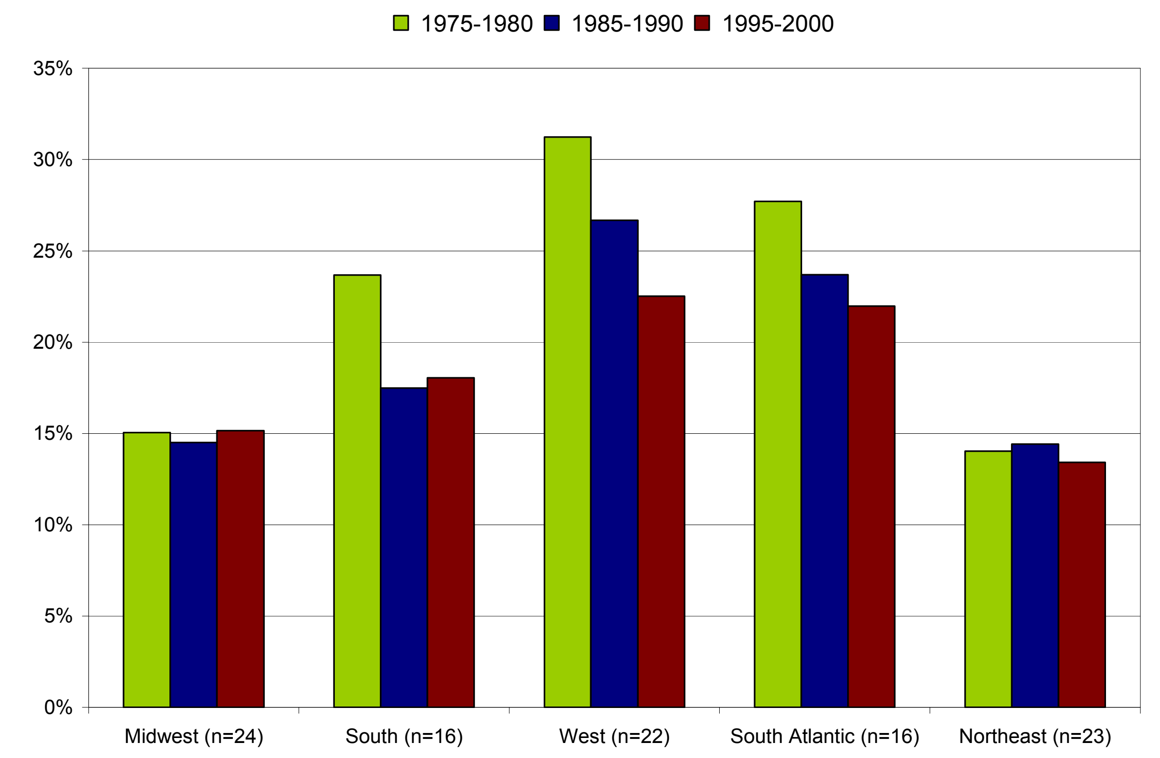
	1975-1980	1985-1990	1995-2000
Percentage In-Migration 18-24 (All Migrants)	42.34	34.03	35.98
	(18.27)	(13.88)	(13.47)
Percentage In-Migration 25-34 (All Migrants)	44.94	34.21	31.42
	(18.46)	(12.64)	(10.74)
Percentage In-Migration 35-44 (All Migrants)	23.94	23.72	20.70
	(13.47)	(10.71)	(8.25)
Percentage In-Migration 45-59 (All Migrants)	13.16	12.83	14.23
	(10.58)	(8.30)	(7.67)
Percentage In-Migration 60 & Over (All Migrants)	11.70	9.33	9.08
	(11.76)	(7.30)	(5.96)
Percentage In-Migration 18-24 (Domestic Migrants)	38.28	29.54	29.01
	(16.84)	(12.23)	(11.44)
Percentage In-Migration 25-34 (Domestic Migrants)	40.49	30.23	26.23
	(16.80)	(11.16)	(9.07)
Percentage In-Migration 35-44 (Domestic Migrants)	21.14	21.22	17.81
	(12.04)	(9.62)	(7.20)
Percentage In-Migration 45-59 (Domestic Migrants)	11.70	11.38	12.50
	(9.65)	(7.47)	(6.79)
Percentage In-Migration 60 & Over (Domestic Migrants)	10.89	8.60	8.21
	(11.13)	(6.79)	(5.40)

Table 3. Means, Standard Deviations and Coefficient of Variation of Selected Independent Variables

Variable	Mean	Standard Deviation	Coefficient of Variation
Percentage Population Growth 1970-1980	15.09	16.61	1.10
Percentage Population Growth 1980-1990	12.46	13.10	1.08
Percentage Population Growth 1990-2000	13.89	12.52	0.90
Percentage In-Migration (all ages) 1975-1980	21.72	9.67	0.45
Percentage In-Migration (all ages) 1985-1990	19.07	7.23	0.38
Percentage In-Migration (all ages) 1995-2000	17.90	6.02	0.34
Percent International (of all Movers) 1975-1980	10.29	7.46	0.72
Percent International (of all Movers) 1985-1990	11.45	9.39	0.82
Percent International (of all Movers) 1995-2000	15.49	8.66	0.56
Percentage High Technology 1970	2.57	0.85	0.33
Percentage High Technology 1980	2.84	1.16	0.41
Percentage High Technology 1990	4.07	1.37	0.34
Percentage High Technology 2000	8.02	2.85	0.36
Percentage Manufacturing 1970	15.54	5.26	0.34
Percentage Manufacturing 1980	11.98	4.46	0.37
Percentage Manufacturing 1990	7.48	2.52	0.34
Percentage Manufacturing 2000	8.28	3.15	0.38
Percentage Finance 1970	4.39	0.77	0.18
Percentage Finance 1980	4.92	0.84	0.17
Percentage Finance 1990	5.17	0.86	0.17
Percentage Finance 2000	4.55	0.71	0.16
Percentage 18 to 24 in 1970	12.01	2.16	0.18
Percentage 18 to 24 in 1980	13.60	1.55	0.11
Percentage 18 to 24 in 1990	13.45	1.61	0.12
Percentage 18 to 24 in 2000	9.68	1.28	0.13
Percentage Over 65 in 1970	8.94	2.08	0.23
Percentage Over 65 in 1980	10.49	2.51	0.24
Percentage Over 65 in 1990	10.66	2.56	0.24
Percentage Over 65 in 2000	12.06	2.38	0.20
July Temperature	76.39	5.79	0.08
July Temperature Squared	5875.60	893.91	15.21
Density 1970	507.62	611.65	1.20
Density 1980	554.75	661.16	1.19
Density 1990	613.34	744.28	1.21
Density 2000	683.80	826.99	1.21

Note: These means and standard deviations of percentage growth are not weighted for population size such that the percentage growth of a small city is equivalent to the percentage growth of a large city. The population weighted means are slightly smaller.

Chart 1. In-Migration Rates to MSAs by Region, and Time Period



Note: A rate is defined as the pace at which an MSA is growing due to in-migration.

Chart 2. Percentage of Manufacturing Jobs within MSAs, by Region and Time Period

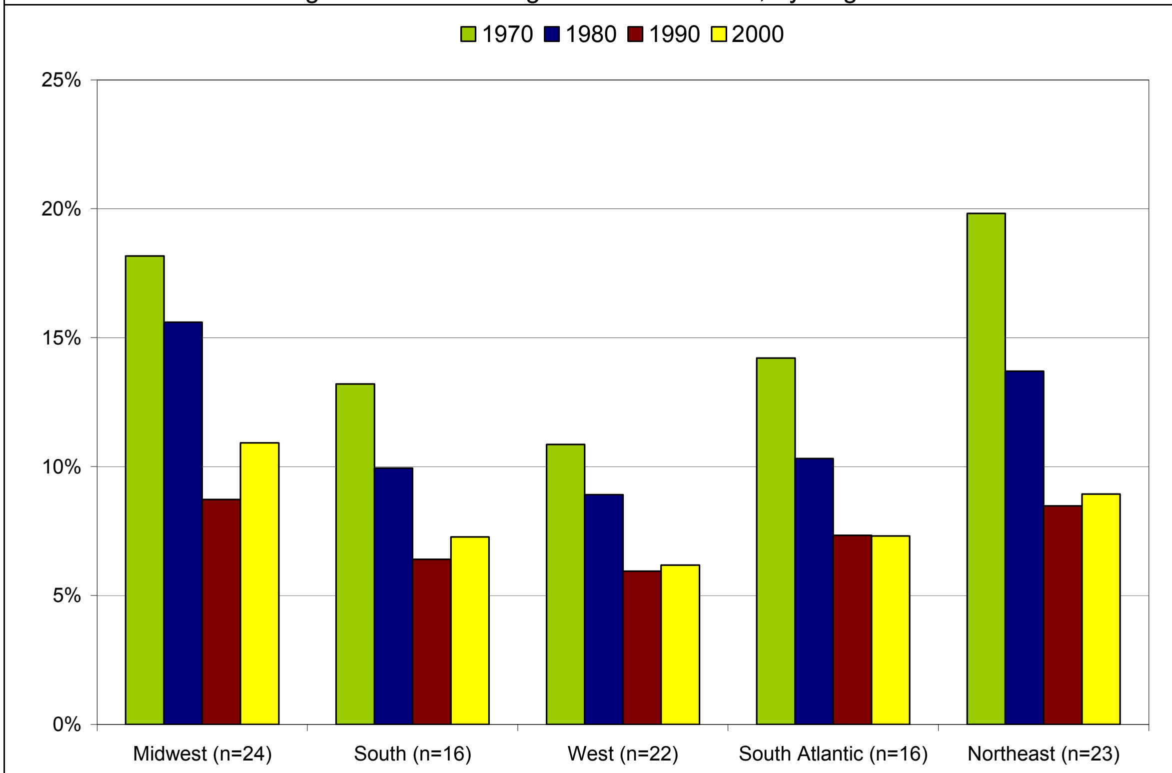


Table 4. Determinants of In-Migration to Metropolitan Areas, by age group: 1975 to 1980

	18-24	25-34	35-44	45-59	60 and over
Intercept	-166.02**	-76.11**	-62.75**	-66.64**	-83.51**
	(-6.05)	(-2.67)	(-3.21)	(-4.22)	(-4.37)
Region: (Reference = South Atlantic)					
Midwest	-9.18**	-12.31**	-9.30**	-5.93**	-6.94**
	(-2.58)	(-3.39)	(-3.75)	(-2.95)	(-2.81)
Northeast	-8.82**	-14.04**	-11.41**	-9.03**	-11.13**
	(-2.63)	(-4.15)	(-5.03)	(-4.97)	(-5.25)
South	0.16	-1.51	-3.19	-4.12*	-7.95**
	(.04)	(-0.40)	(-1.22)	(-1.89)	(-2.89)
West	14.19**	11.84**	7.70**	5.00**	4.87*
	(4.00)	(3.29)	(3.13)	(2.47)	(1.95)
Occupation (Dist. in MSA)					
Percentage High Technology	4.14**	2.81**	1.41	1.15	2.03**
	(3.43)	(2.27)	(1.66)	(1.64)	(2.39)
Percentage Manufacturing	-0.14	-1.13**	-0.71**	-0.33*	-0.34
	(-.41)	(-3.31)	(-3.06)	(-1.77)	(-1.47)
Percentage Finance	2.93*	1.34	0.73	0.90	0.10
	(1.69)	(0.74)	(0.58)	(0.88)	(0.08)
Mean July Temperature	1.34**	1.08**	0.93**	0.75**	0.89**
	(5.96)	(4.78)	(6.02)	(6.03)	(5.97)
Coast	-4.11*	-3.46	-2.62*	-1.29	-2.32
	(-1.87)	(-1.54)	(-1.71)	(-1.04)	(-1.52)
Age (Population in MSA)					
Proportion Age 18-24	4.69**	1.61**	0.53	0.42	0.30
	(7.51)	(2.36)	(1.09)	(1.04)	(0.61)
Proportion Over Age 65	3.06**	2.63**	1.66**	1.88**	2.85**
	(4.20)	(3.58)	(3.39)	(4.80)	(6.59)
Number of observations	98	98	98	98	98
Adjusted R^2:	.75	.73	.73	.66	.66

Note: Occupation and Age Variables measured at the start of the Decennial Interval
t-statistics in parenthesis; ** indicates significance at the 5 percent level; * indicates significance at the 10 per cent level
Regressions are weighted by the number of individuals in the MSA of the individual age category

Table 5. Determinants of In-Migration to Metropolitan Areas, by age group of migrants: 1985 to 1990

	18-24	25-34	35-44	45-59	60 and over
Intercept	-123.62**	-45.19*	-44.99**	-55.77**	-61.84**
	(-5.66)	(-1.95)	(-2.47)	(-4.23)	(-5.21)
Region: (Reference = South Atlantic)					
Midwest	-13.27**	-12.92**	-11.01**	-5.54**	-3.23**
	(-4.64)	(-4.25)	(-4.69)	(-3.30)	(-2.04)
Northeast	-11.18**	-14.17**	-12.68**	-7.55**	-4.98**
	(-4.46)	(-5.40)	(-6.28)	(-5.28)	(-3.86)
South	-9.02**	-8.72**	-6.94**	-3.45*	-3.05*
	(-2.99)	(-2.74)	(-2.79)	(-1.89)	(-1.73)
West	-1.21	-0.20	1.98	4.43**	5.28**
	(-0.42)	(0.06)	(0.83)	(2.54)	(3.23)
Occupation (Dist. in MSA)					
Percentage High Technology	1.65**	1.30*	0.67	0.64	0.72*
	(2.32)	(1.74)	(1.15)	(1.51)	(1.76)
Percentage Manufacturing	0.12	-0.37	-0.42	-0.12	-0.004
	(0.33)	(-0.94)	(-1.36)	(-0.53)	(-0.02)
Percentage Finance	5.19**	5.21**	2.69**	1.85**	1.42*
	(3.65)	(3.42)	(2.27)	(2.19)	(1.82)
Mean July Temperature	0.19	0.20	0.35**	0.48**	0.51**
	(1.15)	(1.12)	(2.60)	(4.91)	(5.69)
Coast	-0.14	-0.72	-2.64*	-1.28	-1.74*
	(-0.08)	(-0.40)	(-1.90)	(-1.28)	(-1.88)
Age (Population in MSA)					
Proportion Age 18-24	6.96**	2.38**	1.77**	0.97**	0.98**
	(10.92)	(3.38)	(3.13)	(2.32)	(2.58)
Proportion Over Age 65	2.09**	1.16**	1.10**	0.98**	1.00**
	(4.67)	(2.51)	(3.08)	(3.86)	(4.74)
Number of observations	98	98	98	98	98
Adjusted R^2:	.75	.64	.67	.67	.65

Note: Occupation and Age Variables measured at the start of the Decennial Interval
t-statistics in parenthesis; ** indicates significance at the 5 percent level; * indicates significance at the 10 per cent level
Regressions are weighted by the number of individuals in the MSA of the individual age category

Table 6. Determinants of In-Migration to Metropolitan Areas, by age group of migrants: 1995 to 2000

	18-24	25-34	35-44	45-59	60 and over
Intercept	-95.36**	-45.19	-51.01**	-62.20**	-57.63**
	(-3.07)	(-1.66)	(-2.74)	(-3.97)	(-5.10)
Region: (Reference = South Atlantic)					
Midwest	-10.30**	-10.01**	-8.36**	-4.91**	-3.10**
	(-2.83)	(-3.15)	(-3.92)	(-2.77)	(-2.33)
Northeast	-8.47**	-10.61**	-9.14**	-6.98**	-4.30**
	(-2.57)	(-3.74)	(-4.82)	(-4.47)	(-3.84)
South	-3.76	-5.08	-4.77**	-3.22*	-2.53*
	(-0.99)	(-1.54)	(-2.12)	(-1.70)	(-1.71)
West	0.45	1.14	1.59	4.58**	4.88**
	(0.13)	(0.38)	(0.78)	(2.66)	(3.78)
Occupation (Dist. in MSA)					
Percentage High Technology	1.84**	1.66**	0.85**	0.54*	0.49**
	(3.22)	(3.41)	(2.53)	(1.89)	(2.27)
Percentage Manufacturing	-0.08	-0.13	-0.12	-0.08	-0.02
	(-0.12)	(-0.23)	(-0.32)	(-0.27)	(-0.10)
Percentage Finance	3.52**	4.20**	1.68*	0.98	0.39
	(2.12)	(2.87)	(1.71)	(1.19)	(0.65)
Mean July Temperature	0.45*	0.44**	0.59**	0.69**	0.60**
	(1.96)	(2.24)	(4.39)	(6.09)	(7.48)
Coast	-3.06	-1.86	-1.98	-1.52	-1.42*
	(-1.40)	(-0.97)	(-1.53)	(-1.41)	(-1.80)
Age (Population in MSA)					
Proportion Age 18-24	4.50**	0.88	0.76	0.75*	0.63*
	(5.69)	(1.23)	(1.53)	(1.76)	(1.97)
Proportion Over Age 65	1.05**	0.38	0.61*	0.73**	0.77**
	(1.82)	(0.76)	(1.85)	(2.64)	(3.98)
Number of observations	98	98	98	98	98
Adjusted R^2:	.50	.48	.55	.60	.65

Note: Occupation and Age Variables measured at the start of the Decennial Interval
t-statistics in parenthesis; ** indicates significance at the 5 percent level; * indicates significance at the 10 per cent level
Regressions are weighted by the number of individuals in the MSA of the individual age category

Table 7. In-Migration to Metropolitan Areas: Regional Variables Only

	25-34			60 and over		
	1975-1980	1985-1990	1995-2000	1975-1980	1985-1990	1995-2000
Intercept	56.01**	43.34**	37.91**	19.91**	12.51**	12.08**
	(17.34)	(18.19)	(16.90)	(8.15)	(8.51)	(9.81)
Region:						
(Reference = South Atlantic)						
Midwest	-24.24**	-16.95**	-9.99**	-14.18**	-6.84**	-5.96**
	(-5.76)	(-5.46)	(-3.42)	(-4.46)	(-3.57)	(-3.72)
Northeast	-25.17**	-16.04**	-14.14**	-14.69**	-7.45**	-6.80**
	(-5.98)	(-5.17)	(-4.84)	(-4.62)	(-3.89)	(-4.24)
South	-5.50	-12.46**	-7.32**	-9.77**	-4.05*	-2.62
	(-1.20)	(-3.70)	(-2.31)	(-2.83)	(-1.95)	(-1.51)
West	6.96	3.18	1.80	0.81	4.08**	2.08
	(1.60)	(0.99)	(0.60)	(0.25)	(2.07)	(1.26)
Number of observations	98	98	98	98	98	98
Adjusted R^2:	.51	.43	.30	.31	.35	.32

Table 8. In-Migration to Metropolitan Areas: Occupational Variables Only

	25-34			60 and over		
	1975-1980	1985-1990	1995-2000	1975-1980	1985-1990	1995-2000
Intercept	79.35**	34.97**	26.49**	24.76**	8.59	21.00**
	(6.05)	(2.86)	(2.48)	(2.52)	(1.14)	(3.52)
Percentage High Technology	-1.91	0.42	0.93*	-1.21	-0.17	-0.26
	(-1.21)	(0.44)	(1.76)	(-1.02)	(-0.30)	(-0.86)
Percentage Manufacturing	-2.62**	-1.53**	-0.96**	-1.17**	-0.67**	-0.96**
	(-7.53)	(-3.47)	(-2.04)	(-4.51)	(-2.47)	(-3.63)
Percentage Finance	1.54	2.58	1.33	1.44	1.59	-0.54
	(0.73)	(1.48)	(0.86)	(0.92)	(1.49)	(-0.63)
Number of observations	98	98	98	98	98	98
Adjusted R^2:	.44	.27	.14	.23	.17	.12

Table 9. In-Migration to Metropolitan Areas: Age Variables Only

	25-34			60 and over		
	1975-1980	1985-1990	1995-2000	1975-1980	1985-1990	1995-2000
Intercept	-5.15	-17.37	16.92	-15.40	-11.45	-3.41
	(-0.29)	(-1.00)	(1.14)	(-1.34)	(-1.12)	(-0.41)
Proportion Age 18-24	3.08**	2.86**	1.20	0.95	1.05*	0.71
	(3.24)	(2.99)	(1.47)	(1.55)	(1.86)	(1.56)
Proportion Over Age 65	1.46	1.21	-0.15	1.74**	0.61*	0.28
	(1.45)	(2.04)	(-0.29)	(2.68)	(1.75)	(0.96)
Number of observations	98	98	98	98	98	98
Adjusted R^2:	.08	.07	.02	.05	.02	.004

Note: For tables 7,8 & 9 - Occupation and Age Variables measured at the start of the Decennial Interval
t-statistics in parenthesis; ** indicates significance at the 5 percent level; * indicates significance at the 10 per cent level
Regressions are weighted by the number of individuals in the MSA of the individual age category

Table 10. Determinants of In-Migration to Metropolitan Areas (domestic movers only), by selected age group

	1975-1980		1985-1990		1995-2000	
	25-34	60 and over	25-34	60 and over	25-34	60 and over
Intercept	122.64	207.62**	224.96**	51.36	294.23**	64.97
	(1.13)	(2.77)	(2.61)	(1.13)	(3.37)	(1.54)
Region:						
(Reference = South Atlantic)						
Midwest	-6.58**	-2.91	-9.57**	-1.27	-7.11**	-1.98*
	(-2.05)	(-1.32)	(-3.77)	(-0.95)	(-3.05)	(-1.72)
Northeast	-8.56**	-6.55**	-9.61**	-2.32**	-6.83**	-2.95**
	(-2.82)	(-3.37)	(-4.20)	(-2.01)	(-3.12)	(-2.88)
South	3.22	-9.90**	-11.26**	-4.28**	-8.86**	-3.95**
	(-0.96)	(-4.17)	(-4.10)	(-2.83)	(-3.61)	(-3.08)
West	10.27**	3.55	3.01	4.28**	-3.13	2.78**
	(3.15)	(1.57)	(1.09)	(2.86)	(-1.26)	(2.20)
Occupation (Dist. in MSA)						
Percentage High Technology	2.61**	1.50*	0.77	0.56	0.62	0.23
	(2.34)	(1.94)	(1.20)	(1.60)	(1.62)	(1.20)
Percentage Manufacturing	-1.13**	-0.38*	-0.30	-0.01	-0.05	-0.08
	(-3.85)	(-1.96)	(-0.93)	(-0.09)	(-0.13)	(-0.41)
Percentage Finance	2.02	0.37	5.02**	1.89**	4.38**	0.93*
	(1.25)	(0.33)	(3.82)	(2.79)	(3.74)	(1.67)
Mean July Temperature	-3.79	-6.50**	-6.58**	-2.17*	-8.01**	-2.37**
	(-1.35)	(-3.36)	(-2.97)	(-1.86)	(-3.67)	(-2.23)
Mean July Temperature Squared	0.03*	0.05**	0.05**	0.02**	0.05**	0.02**
	(1.71)	(3.82)	(3.11)	(2.30)	(3.89)	(2.77)
Coast	-1.16	0.36	0.57	0.42	0.21	-0.12
	(-0.51)	(0.24)	(0.32)	(0.44)	(0.13)	(-0.15)
Fraction of International Migrants	-0.38**	-0.11**	-0.31**	-0.10**	-0.33**	-0.07**
(of total movers to MSA)	(-4.57)	(-2.02)	(-5.43)	(-3.49)	(-5.29)	(-2.34)
MSA population at least 750,000	-6.60**	-3.61**	-4.30**	-3.24**	-3.69*	-2.15**
	(-2.95)	(-2.46)	(-2.40)	(-3.61)	(-1.81)	(-2.29)
Age (Population in MSA)						
Proportion Age 18-24	0.89	-0.09	1.84**	0.43	0.82	0.42
	(1.45)	(-0.21)	(2.92)	(1.24)	(1.48)	(1.46)
Proportion Over Age 65	1.86**	2.04**	0.47	0.55**	-0.36	0.41**
	(2.90)	(5.21)	(1.20)	(2.95)	(-0.95)	(2.30)
Number of observations	98	98	98	98	98	98
Adjusted R^2:	.79	.74	.73	.73	.69	.71

Note: Occupation and Age Variables measured at the start of the Decennial Interval
t-statistics in parenthesis; ** indicates significance at the 5 percent level; * indicates significance at the 10 per cent level
Regressions are weighted by the number of individuals in the MSA of the individual age category

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Appendix:
Listing of the Counties Contained in Each Metropolitan Area (Based on 1990 Census Geography)

Akron, OH	Portage County, Summit County
Albany, NY	Albany, Greene, Montgomery, Rensselaer, Saratoga, Schenectady
Albuquerque, NM	Bernalillo
Allentown, PA	**New Jersey**: Warren, **Pennsylvania**: Carbon, Lehigh, Northampton
Anaheim, CA	Orange County
Appleton, WI	Calumet, Outagamie, Winnebago
Atlanta, GA	Barrow, Butts, Cherokee, Clayton, Cobb, Coweta, Dekalb, Douglas, Fayette, Forsyth, Fulton, Gwinnett, Henry, Newton, Paulding, Rockdale, Spalding, Walton
Augusta, GA	**Georgia:** Columbia, McDuffie, Richmond, **South Carolina:** Aiken
Austin, TX	Hays, Travis and Williamson
Bakersfield, CA	Kern
Baltimore, MD	Anne Arundel, Baltimore, Carroll, Harford Howard, Queen Anne's, Baltimore city
Baton Rouge, LA	Ascension, East Baton Rouge, Livingston, West Baton Rouge
Beaumont, TX	Hardin, Jefferson, Orange
Binghamton, NY	Broome, Tioga
Birmingham, AL	Blount, Jefferson, St. Clair, Shelby, Walker
Boston, MA	**Massachusetts:** Essex, Middlesex, Norfolk, Plymouth, Suffolk, Worcester; **New Hampshire:** Hillsborough: (Pelham town)
Buffalo, NY	Erie
Canton, OH	Carrol, Stark
Charleston, SC	Berkely, Charleston, Dorchester
Charlotte, NC	**North Carolina**: Cabarrus, Gaston, Lincoln, Mecklenburg, Rowan, Union, **South Carolina**: York
Chicago, IL	**Illinois:** Kane, Kendall, Cook, Dupage, McHenry, Grundy, Will, **Indiana:** Lake, Porter, **Wisconsin:** Kenosha
Cincinnati, OH	**Indiana:** Dearborn **Kentucky:** Boone, Campbell, Kenton, **Ohio:** Clermont, Hamilton, Warren
Cleveland, OH	Cuyahoga, Geauga, Lake, Medina
Columbia, SC	Lexington, Richland
Columbus, OH	Delaware, Fairfield, Franklin, Licking, Madison, Pickaway, Union
Corpus Christi, TX	Nueces, San Patricio
Dallas, TX	Collin, Dallas, Denton, Ellis, Kaufman, Rockwall, Johnson, Parker,Tarrant
Dayton, OH	Clark, Greene, Miami, Montgomery
Denver, CO	Boulder, Adams, Arapahoe, Denver, Douglas, Jefferson
Detroit, MI	Lapeer, Livington, Macomb, Monroe, Oakland, St. Clair, Wayne
El Paso, TX	El Paso
Erie, PA	Erie
Flint, MI	Genesee County
Fort Lauderdale, FL	Broward County
Fort Wayne, IN	Allen, De Kalb, Whitley
Fresno, CA	Fresno
Grand Rapids, MI	Kent, Ottawa
Greensboro, NC	Davidson, Davie, Forsyth, Guilford, Randolph, Stokes, Yadkin
Greenville, SC	Greensville, Pickens, Spartanburg
Harrisburg, PA	Cumberland, Dauphin, Lebanon, Perry
Hartford, CT	Hartford, Tolland, Middlesex
Honolulu, HI	Honolulu
Houston, TX	Brazoria, Galveston, Fort Bend, Harris, Liberty, Montgomery, Waller
Indianapolis, IN	Boone, Hamilton, Hancock, Hendricks, Johnson, Marion, Morgan, Shelby
Jackson, MS	Hinds, Madison, Rankin
Jacksonville, FL	Clay, Duval, Nassau, St. Johns
Kansas City, MO	**Kansas**: Johnson, Leavenworth, Miami, Wyandotte, **Missouri**: Cass, Clay, Jackson, Lafayette, Platte, Ray
Knoxville, TN	Anderson, Blout, Grainger, Jefferson, Knox, Sevier, Union
Lancaster, PA	Lancaster

Las Vegas, NV	Clark
Little Rock, AK	Faulkner, Lonoke, Pulaski, Saline
Lorain, OH	Lorain County
Los Angeles, CA	Los Angeles
Madison, WI	Dane
Miami, FL	Broward, Dade
Milwaukee, WI	Milwaukee, Ozaukee, Washington, Waukesha
Minneapolis, MN	**Minnesota**: Anoka, Carver, Chisago, Dakota, Hennepin, Isanti, Ramsey, Scott; **Wisconsin**: St. Croix
Mobile, AL	Baldwin, Mobile
Nashville, TN	Cheatham, Davidson, Dickson, Robertson, Rutherford, Sumner, Williamson, Wilson
New Britain, CT	Hartford County pt: Berlin town, New Britain town, Plainville town
New Haven, CT	New Haven County (apx)
New Orleans, LA	Jefferson, orleans, St. bernard, St. Charles, St John the Baptist, St. Tammany
New York, NY	**New Jersey**: Bergen, Passaic, Hudson, Hunterdon, Middlesex, Somerset, Monmouth, Ocean, **Connecticut**: Fairfield County, New haven County (pt): Ansonia town, Beacon Falls town, Derby town, Milford town, Oxford town, Seymour town. **New York**: Nassau, Suffolk, Bronx, Kings, New York, Putnam, Queens, Richmond, Rockland, Westchester
Newark, NJ	Essex, Morris, Sussex, Union
Odessa, TX	Ector
Omaha, NE	**Iowa:** Pottawattamie, **Nebraska:** Douglas, Sarpy, Washinton
Orlando, FL	Orange, Oscela, Seminole
Peoria, IL	Peoria, Tazewell, Woodford
Philadelphia, PA	**New Jersey:** Burlington, Camden, Gloucester, Cumberland. Salem, **Pennsylvania:** Bucks, Chester Delaware, Montgomery, Philadelphia: **Deleware:** New Castle **Maryland:** Cecil
Phoenix, AZ	Maricopa
Pittsburgh, PA	Beaver, Allegheny, Fayette, Washington, Westmoreland
Portland, OR	**Oregon:** Clackamas, Multnomah, Washington, Yamhill, **Washington:** Clark
Providence, RI	**Massachusetts:** Bristol, **Rhode Island:** Providence, Washington
Raleigh, NC	Durham, Franklin, Orange, Wake
Reading, PA	Berks
Richmond, VA	Charles City, Chesterfield, Dinwiddle, Goochland, Hanover, Herico, New Kent, Powhatan, Prince Georges, Colonial Heights city, Hopewell city, Petersberg city, Richmond city
Riverside, CA	Riverside County, San Bernardino County
Rockford, IL	Boone, Winnebago
Sacramento, CA	El Dorado, Placer, Sacramento, Yolo
Salinas, CA	Monterey
Salt Lake City, UT	Davis, Salt Lake County, Weber County
San Antonio, TX	Bexar, Comal, Guadalupe
San Diego, CA	San Diego
San Francisco, CA	Alameda, Contra Costa, Marin, San Francisco County, San Mateo
San Jose, CA	Santa Clara County
Santa Barbara, CA	Santa Barbara
Seattle, WA	King, Snohomish
Sharon, PA	Mercer
Shreveport, LA	Bossier, Caddo
South Bend, IN	St. Joseph
Spokane, WA	Spokane
Springfield, MA	Hampden, Hampshire
St. Louis, MO	**Illinois:** Clinton, Jersey, Madison, Monroe, St. Clair, **Missouri:** Franklin, Jefferson, St. Charles, St. Louis, St Louis city
Stockton, CA	San Joaquin County
Syracuse, NY	Madison, Onondaga, Oswego
Tacoma, WA	Pierce County
Trenton, NJ	Mercer County
Tucson, AZ	Pima

Tulsa, OK	Creek, Osage, Rogers, Tulsa, Wagoner
Utica, NY	Herkimer, Oneida
Ventura, CA	Ventura County
Washington, DC	**District of Columbia:** DC county, **Maryland:** Calvert, Charles, Federick, Montgomery, Prince George's, **Virginia:** Arlington, Fairfax, Loudoun, Prince William, Stafford, Alexandria city, Fairfax city, Falls Church city, Manassas city, Manassas Park city
West Palm Beach, FL	Palm Beach
Wichita, KS	Bulter, Harvey, Sedgwick
Worcester, MA	Worcester County
York, PA	Adams, York

*Note: To prevent double counting, the analysis assigns counties to only one metropolitan area. For example Trenton, NJ is treated as a separate metropolitan area and is excluded from Philadelphia, PA.
*All counties are in the same state as the metropolitan area, unless otherwise specified.