APPLIED ECONOMICS

PINAL PROJECTIONS STUDY
TASK 6: EMPLOYMENT & POPULATION LAG AND FACTORS AFFECTING GROWTH

PREPARED FOR:

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EXECUTIVE SUMMARY

This white paper transmits the results of an analysis of employment and population growth lags and factors affecting growth in a sample of historical bedroom communities within Maricopa County, case study edge counties, and Pinal County. The analysis involves the assessment of growth in employment and population, correlations of population growth with employment growth over time and by population size, and the identification and discussion of factors resulting in increased employment-to-population ratios. It also includes details of young edge county development in a candidate metropolitan region and the actions the county took to prevent bedroom community development.

Case study edge counties within five metropolitan areas were chosen through an exhaustive review of employment and population change over time, and proximity to central counties. Characteristics deemed desirable for comparison to Pinal County included:

- rapid population and employment growth
- rapid urbanization because of metropolitan expansion
- structural industry change due to urbanization and
- location on the periphery of metropolitan areas and the leading edge of growth.

The following counties were chosen as case study edge counties:

- Adams County, Colorado
- Arapahoe County, Colorado
- Cobb County, Georgia
- Collin County, Texas
- DeKalb County, Georgia
- Denton County, Texas
- Gwinnett County, Georgia
- Riverside County, California
- San Bernardino County, California
- Seminole County, Florida

Case study edge counties' experiences suggest Pinal County's lack of employment growth is unlikely to continue. The typical edge county began several decades of robust population growth with an initial surge in population. Concurrently, non-basic employment growth sharply increased to meet market demand for population-serving businesses. After a lag of about five years, basic employment growth ensued as an independent market area and labor force developed. This cycle continued with succeeding periods of population growth.

Over the development cycle, employment-to-population ratios evolved in the case study edge counties in a distinct manner. Basic industry growth was minimal and kept pace with population growth, resulting in a relatively unchanged basic employment-to-population ratio. Non-basic employment increased over the period and was the source for increases in the overall employment-to-population ratio. The growth patterns indicate key market thresholds would be the turning point for population and employment lag in case study edge counties.

When case study edge counties' population and corresponding employment reached threshold levels, the trend of employment and population growth became distinctly different. After reaching market thresholds, non-basic employment began down a path of markedly stronger growth relative to population growth, while basic employment growth was similar to population growth. In a sample of high-growth counties, the lag between population and employment began to decline when the number of residents reached between 150,000 and 250,000 or when employment ranged from 50,000 and 120,000.

A number of business climate factors were common to high-growth counties. These factors may have aided in the increased growth of employment relative to population. Four main categories were identified as common across the counties:

- Education attainment
- Accessibility
- Pro-business environment
- Quality of life

A review of historical bedroom communities within Maricopa County that have developed into extensions of the metropolitan area economy is included. Each city began as a rural bedroom community and after several decades of very strong population growth, the bedroom community condition has dissipated in most cities. Evidence suggests the cities are expected to witness continued strong employment growth relative to population growth, resulting in increased employment-to-population ratios over time.

1.0 INTRODUCTION

This report presents findings of an analysis of the lag between employment and population growth of case study counties chosen from five metropolitan areas, communities within Maricopa County, and the tri-county study area. The purpose of this employment and population lag analysis is twofold: 1) investigate case study edge counties' and Maricopa County communities' experiences with employment growth lags and 2) examine what the experiences suggest for Pinal County's employment and population outlook, compared to Maricopa and Pima Counties. This report, in conjunction with other research for the Pinal County Projections Study, will provide the Central Arizona Association of Governments with defensible population, households, and employment projections.

1.1 Report Organization

Section 2.0 presents the case study edge counties and cities. The selection process through which the counties were chosen is detailed. A map highlighting the selected counties and metropolitan areas is included.

Section 3.0 investigates the lag between population and employment in case study edge counties and the tri-county study area. Correlations and trend analysis are used to determine how population and employment growth interact and whether or not there exists key market thresholds.

Section 4.0 presents business climate factors common to high-growth/high employment-to-population ratio case study edge counties. The experience of a smaller county from the metropolitan Atlanta area is briefly discussed. The experience lends credibility to the idea that that these business factors may play a role in shortening the lag between population and employment growth.

Section 5.0 examines the case study edge city experience. Rapid population growth within these historical bedroom communities was sustained for many decades. Data shows most cities have developed into extensions of the metropolitan area with employment-to-population ratios appreciably higher than 20 years ago.

2.0 CASE STUDY COUNTY AND CITY SELECTION

One of the goals of the Pinal County Projections Study is to provide defensible projections of population, households, and employment. The goal of Task 6 of the study is to examine case-study edge counties and cities and evaluate what their experiences with employment and population lag suggest for the future of Pinal County. Achieving the goal of Task 6 requires carefully selecting case study counties to develop inferences from their experiences. This section explains the approach used in selecting the case study counties relevant to Pinal County.

2.1 Metropolitan Areas

With the assistance of the staff of the Central Arizona Association of Governments, five metropolitan areas were selected from an original list of seven. All seven metropolitan areas have experienced high levels of growth in which urbanization was expanding into previously suburban or exurban areas. However, some of the characteristics of the metropolitan areas made them a poor comparison with the tri-county study area. The five metropolitan areas or combined statistical areas chosen include:

- Denver – Aurora MSA (Adams, Arapahoe, Broomfield, Clear Creek, Denver, Douglas, Elbert, Gilpin, Jefferson, and Park Counties)
- Orlando – Kissimmee MSA (Lake, Orange, Osceola, and Seminole Counties)
- Atlanta – Sandy Springs – Marietta MSA (Barrow, Bartow, Butts, Carroll, Cherokee, Clayton, Cobb, Coweta, Dawson, DeKalb, Douglas, Fayette, Forsyth, Fulton, Gwinnett, Haralson, Heard, Henry, Jasper, Lamar, Meriwether, Newton, Paulding, Pickens, Pike, Rockdale, Spalding, and Walton Counties)
- Dallas – Fort Worth – Arlington MSA (Collin, Dallas, Delta, Denton, Ellis, Hunt, Johnson, Kaufman, Parker, Rockwall, Tarrant, and Wise Counties)
- Los Angeles – Long Beach – Riverside – San Diego CSA (Los Angeles, Orange, Riverside, San Bernardino, and San Diego Counties)

2.2 Case Study County Selection Process

Case study counties within the five metropolitan areas were chosen through an exhaustive review of employment and population change over time and proximity to central business counties. Characteristics of viable case study counties included: 1) rapid population and employment growth over the thirty-year period 2) rapid urbanization because of metropolitan expansion 3) structural industry change due to urbanization 4) "edge county" locations that were at the outskirts of metropolitan areas and the leading edge of growth.[1]

The majority of the metropolitan areas considered were comprised of many counties that cannot today, or historically, be considered "edge counties." Some of the counties are many miles away from the central business county, the county possessing the central business district(s), or some semblance of the metropolitan area's urbanization. Some counties possess employment and population levels too small and/or have been stagnant or declining. Still, other counties have sizable populations, but not as a result of urbanization pressure from the central metropolitan county. We would not consider these counties to be representative of the future of Pinal County.

[1] Land, Robert E. and Simmons, Patrick A., "Edge Counties: Metropolitan Growth Engines," *Fannie Mae Foundation Census Note #11*, June 2003

Based on all of the available information the following counties chosen for their adherence to the criteria mentioned above include:

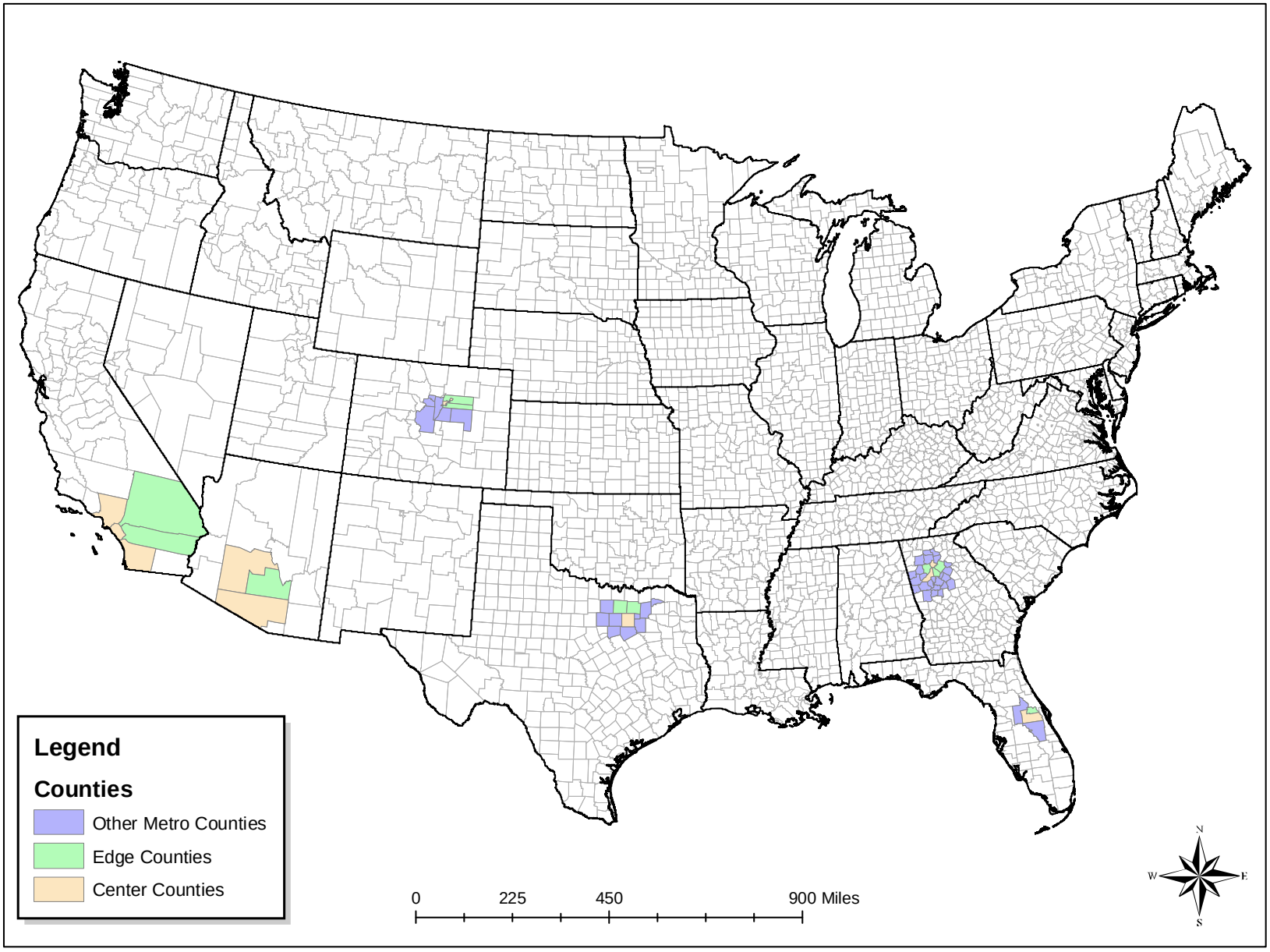
- Collin County, Texas
- Denton County, Texas
- Cobb County, Georgia
- DeKalb County, Georgia
- Gwinnett County, Georgia
- Adams County, Colorado
- Arapahoe County, Colorado
- Seminole County, Florida
- San Bernardino County, California
- Riverside County, California

Figure 2-1 displays the tri-county study area and the metropolitan areas for the case studies. Center counties (Denver County, Colorado, Fulton County, Georgia, Dallas County, Texas, Orange County, Florida, and Los Angeles, Orange, and San Diego Counties, California) are colored beige. Edge counties are colored green. The remaining counties are colored purple.

2.3 Case Study Edge Cities

With the assistance of the Central Arizona Association of Governments, five historical bedroom communities within Maricopa County are examined. The historical bedroom communities that are now thriving cities include Gilbert, Glendale, Peoria, Avondale, and Chandler.

FIGURE 2-1
CASE STUDY METROPOLITAN AREAS AND TRI-COUNTY STUDY AREA



3.0 POPULATION AND EMPLOYMENT LAG AND STRUCTURE

The purpose of this section is to analyze the lag between population and employment growth in case study edge counties over their development cycle. The analysis is extended by presenting sector employment-to-populations ratios and discussing the structural development of case study edge counties' economies over the same period. Results from this section are used to lay a foundation for succeeding sections and the study overall.

3.1 Case Study Edge Counties

Although the magnitude of the bedroom community condition affecting Pinal County is unique, the condition itself is common to edge counties. Historically, because of metropolitan area expansion, commuters drive population growth in edge counties. Usually after rapid residential development begins, a round of non-basic employment growth ensues, including retail and personal service businesses, schools, local government and other population-serving sectors of the economy. More slowly, as an edge county gains a substantial labor force and independent market area, basic jobs begin to emerge, then this further fuels population and non-basic employment growth.

Table 3-1 summarizes the development differences of the case study edge counties. Some counties have undergone rapid changes for many decades, others are younger, and still others have experienced noticeable cyclical changes in population and employment for several decades. Several distinctions are highlighted including: population growth in two phases, the nature of the appreciation in the ratio of employment to population, and the actual ratio of employment-to-population.

Expectedly, case study edge counties in older metropolitan areas experienced their first phases of population growth in the 1950's. With the exception of Gwinnett County, Georgia, all other case study edge counties in the Los Angeles, Atlanta, and Denver metropolitan areas experienced their first wave of population growth in the 1950's. Gwinnett County, Georgia, and the remaining case study edge counties, Seminole County, Florida, and Collin and Denton Counties, Texas, experienced their first waves of population growth in the early 1970's.

Second phases of population growth in the case study edge counties were identifiable by respective metropolitan areas. Edge counties in the Los Angeles metropolitan area experienced a second phase of population growth, simultaneously, in the late 1970's. Edge counties in the Denver metropolitan region didn't experience a recognizable second phase of population growth, as was the case in Seminole County, Florida. Collin and Denton Counties, Texas experienced second phases of population growth in the 1990's, while edge counties in the Atlanta metropolitan area shared no distinct characteristics in a second phase of population growth.

As Table 3-1 summarizes, the actual employment-to-population ratio and the way the ratio appreciated and depreciated over time are also varied across case study edge counties. Edge counties in the Los Angeles metropolitan area saw an employment-to-population ratio that steadily appreciate and ultimately resulted in a marginal net gain since the 1970's. From 1970 to 2000, both Riverside and San Bernardino Counties' employment-to-population ratios increased from about 0.36 to approximately 0.43. Counties in the Denver metropolitan area experienced strictly appreciating employment-to-population ratios. From 1970 to 2000, Adams County, Colorado witnessed an increase from around 0.26 to just over 0.52. Arapahoe County, Colorado, similarly, witnessed an increase from 0.31 to nearly 0.81.

TABLE 3-1
CASE STUDY EDGE COUNTIES
DEVELOPMENT HISTORY CHARACTERISTICS

	California		Colorado		Florida	Atlanta			Texas	
	Riverside	San Bernardino	Adams	Arapahoe	Seminole	Cobb	DeKalb	Gwinnett	Collin	Denton
Population Growth										
1st Phase	1950's	1950's	1950's	1950's	1970's	1950's	1950's	1973	Late 1960's	1971
2nd Phase	1977	1977	None	None	None	Gradual	None	1984	1993	1998
Employment-to-Population Ratio										
Nature of Appreciation	Steady	Steady	Strong	Strong	Strong	Steady	Mixed	Mixed	Strong	Steady
Ratio in 1970	0.37	0.36	0.27	0.31	0.28	0.38	0.37	0.24	0.28	0.35
Ratio in 2000	0.43	0.42	0.52	0.81	0.51	0.65	0.62	0.60	0.50	0.38
Net Change	0.05	0.06	0.26	0.49	0.23	0.27	0.25	0.36	0.23	0.03

Sources: U.S. Census Bureau; Bureau of Economic Statistics.

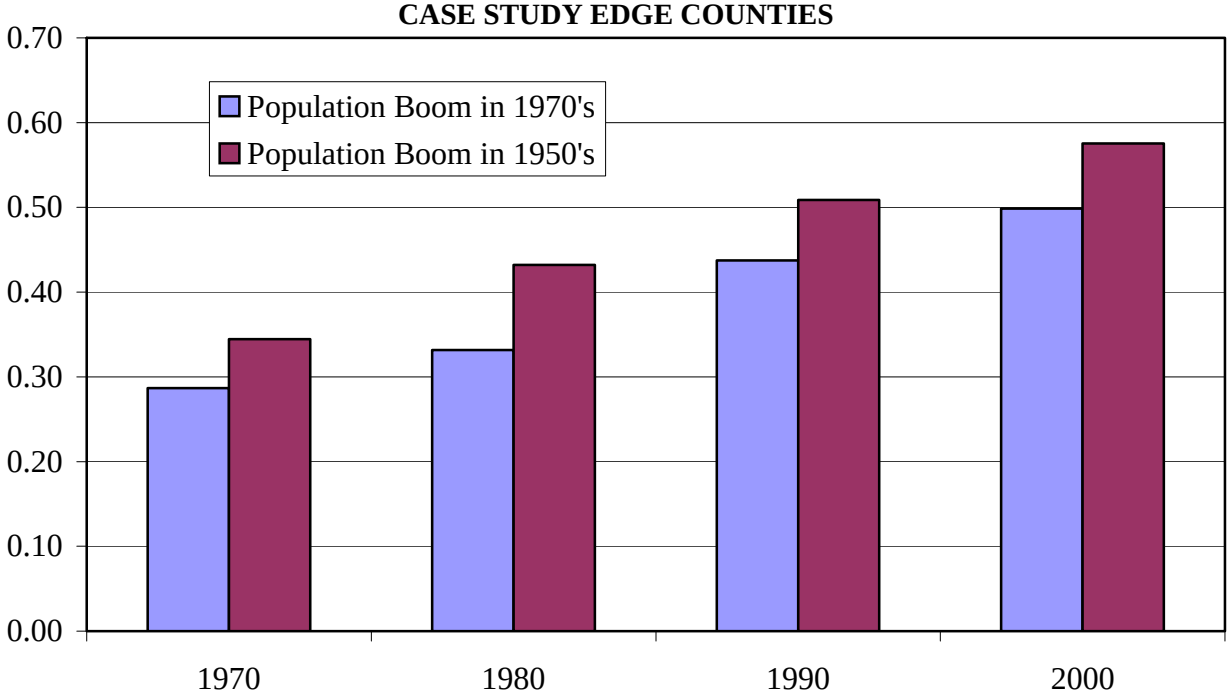
Seminole County, Florida witnessed strong growth the ratio of employment-to-population, similar to Adams County, Colorado, but in a shorter time span. From 1970 to 2000, the employment-to-population ratio increased from 0.28 to about 0.51. Two of three counties in the metropolitan Atlanta area saw a mixed change in the ratio of employment to population; that is, the overall appreciation in the ratio was the net result an appreciation and depreciation over the development cycle. Cobb County, Georgia, however, experienced a steady appreciation in the ratio of employment to population. Gwinnett County, Georgia saw the greatest appreciation; from 1970 to 2000, the employment-to-population ratio in the county rose from 0.24 to 0.60. The case study edge counties from the Dallas metropolitan area saw two different histories of employment growth emerge. Denton County, Texas saw slow and steady growth that resulted in the smallest appreciation over the period. From 1970 to 2000, the employment-to-population ratio in Denton County increased from 0.35 to only 0.38. Collin County, however, witnessed a pattern of strong appreciation that resulted in a ratio increase from 0.28 to 0.50.

Table 3-1 demonstrates that historical development in case study edge counties is varied. That said, there are characteristics in some counties that are shared with others. The first characteristic shared across a select group of counties is the "first phase" of population growth. Six counties experienced their first population booms in the 1950's. Four remaining counties experienced their first population boom in the 1970's. The second characteristic common to certain groups of counties is the magnitude of change in the employment-to-population ratios. Three counties experienced little appreciation in their ratios. Seven counties, however, saw a net change of at least 230 additional employees per 1000 residents and at most about 490 additional employees per 1000 residents.

3.1.1 Employment-to-Population Ratios

Figure 3-1 illustrates the appreciation in the employment-to-population ratios controlling for the year of the initial population boom. As expected, those areas that experienced upwards of twenty years of population growth before 1970 have higher average employment-to-population ratios. In 1970, the six older counties had an average ratio of 0.34. By 2000, the ratio had reached 0.58.

FIGURE 3-1
EMPLOYMENT-TO-POPULATION RATIOS
CASE STUDY EDGE COUNTIES



Sources: U.S. Census Bureau; Bureau of Economic Analysis, Bureau of Labor Statistics.

The older counties' trend is biased downward initially by Adams County, Colorado and upwards over time by Arapahoe County, Colorado. In 1970, Adams County had a ratio of only 0.27. In 2000, Arapahoe County had a very strong ratio of almost 0.81. Removing these counties from the average results in a net increase in the ratio of 0.03 in 1970 and 0.05 in 2000.

The four younger counties, also as expected, have smaller employment-to-population ratios. In 1970, the four counties had an average ratio of 0.29. By 2000, the ratio had reached 0.50. The trend of the younger counties' average ratio over time was biased as a result of Denton County, Texas. Initially, Denton County had a ratio near 0.35, driving the average slightly upward. By 2000, Denton County's ratio had only reached 0.38, driving down the overall average. Removing Denton County from the overall average yields a 1970 ratio of 0.27 and a 2000 ratio of 0.54.

Figure 3-1 shows that the older counties on average tend to have 50 to 70 more employees per 1000 residents. The reason for this difference is likely market maturity, though there may be many factors leading to nuances in the data including: the magnitude of later population booms, changes in the structure of the broader macroeconomy and its effects on more local economies, and business cycles. Presumably, the effects of these uncontrolled-for-factors can be estimated. Population booms will likely slow the pace of appreciation or result in declines in ratios. Structural changes in the economy will likely result in initial declines in employment-to-population ratios, but overtime will potentially lead to stronger ratios. Downturns lead to declines in ratios, while growth the opposite. These caveats and those in the following paragraph apply to the succeeding sections.

Determining whether or not case study edge counties are still bedroom communities requires analysis of each county against various benchmarks. Compared to national employment-to-population ratios, many counties may appear to be lacking in gains in employment growth relative to population growth. Compared to regional employment-to-population ratios, however, many counties may appear to be less identifiable as a bedroom community. Still, some counties, like Denton County, Texas, are still very much bedroom communities as the county's ratio is below any meaningful benchmark.

3.1.2 Basic and Non-Basic Employment

The appreciations in the employment-to-populations ratios in the previous section show jobs are following population growth. After 30 years of growth for the counties having experienced population booms in the 1970's, there are about two residents for every worker. After 50 years of growth for counties having experienced population booms in the 1950's, the ratio of residents to workers falls to almost 1.5 residents for every worker. The lag in the numbers of jobs per resident is falling with time.

This section aims to determine the extent to which basic and non-basic employment grows over time in the older and younger counties combined. The older the county, the more likely continued population growth is met by both basic and non-basic industries. The younger the county, the more likely a boom in population growth will be associated with an initial surge in population-serving non-basic employment growth. As a younger county matures, its labor force grows and independent market areas emerge, resulting in basic employment growth. The more mature the younger counties become the likelier basic and non-basic growth further fuels population growth and the cycle continues.

Table 3-2 presents correlations of basic and non-basic employment growth with an initial period of population growth from 1970 to 1975. Correlation coefficients are designed to measure the interdependence of two variables. A coefficient of 1 would indicate perfect correlation, while a coefficient of 0 would indicate no relationship between the variables. The coefficients substantiate claims

that concurrently and after a population boom in an edge county occurs, non-basic local-serving businesses grow to meet market demand and then basic employment follows.

The period of the largest increase in population was modestly correlated with basic employment growth and more strongly correlated with non-basic employment growth. The initial influx of residents led to increased demand for population-serving industries. Over the following decade, 1975 to 1985, non-basic employment growth remained strongly correlated with population growth. During the same period, basic employment growth experienced two-five year periods of strong correlation with population growth from 1970 to 1975. The five-year lag before basic employment growth begins to correlate strongly with population growth is likely the result of the time required for the development and response to the independent market area and substantial labor force. The results remain useful despite the dampening effects of steady, though not necessarily strong, population and employment growth from older counties.

TABLE 3-2
CORRELATIONS WITH POPULATION GROWTH FROM 1970 TO 1975
CASE STUDY EDGE COUNTIES

Years	Basic Employment Growth	Non-Basic Employment Growth
1970-1975	0.52	0.77
1975-1980	0.76	0.73
1980-1985	0.72	0.84

Source: Applied Economics.

The same analysis, for the next five years of population growth, is conducted a second time and presented in Table 3-3. The analysis reiterates the notion that jobs do follow people and for quite some time. Data indicates that non-basic employment growth is positively correlated with population growth during the initial period of population growth and in every period after. Evidence that basic employment growth occurs simultaneously with population growth is weaker. Tables 3-2 and 3-3 suggest basic employment growth is likely to lag five years after population growth, while non-basic employment growth should increase steadily with population growth to meet market demand for population-serving businesses in every period.

TABLE 3-3
CORRELATIONS WITH POPULATION GROWTH FROM 1975 TO 1980
CASE STUDY EDGE COUNTIES

Years	Basic Employment Growth	Non-Basic Employment Growth
1975-1980	0.442	0.539
1980-1985	0.685	0.745
1985-1990	0.721	0.636

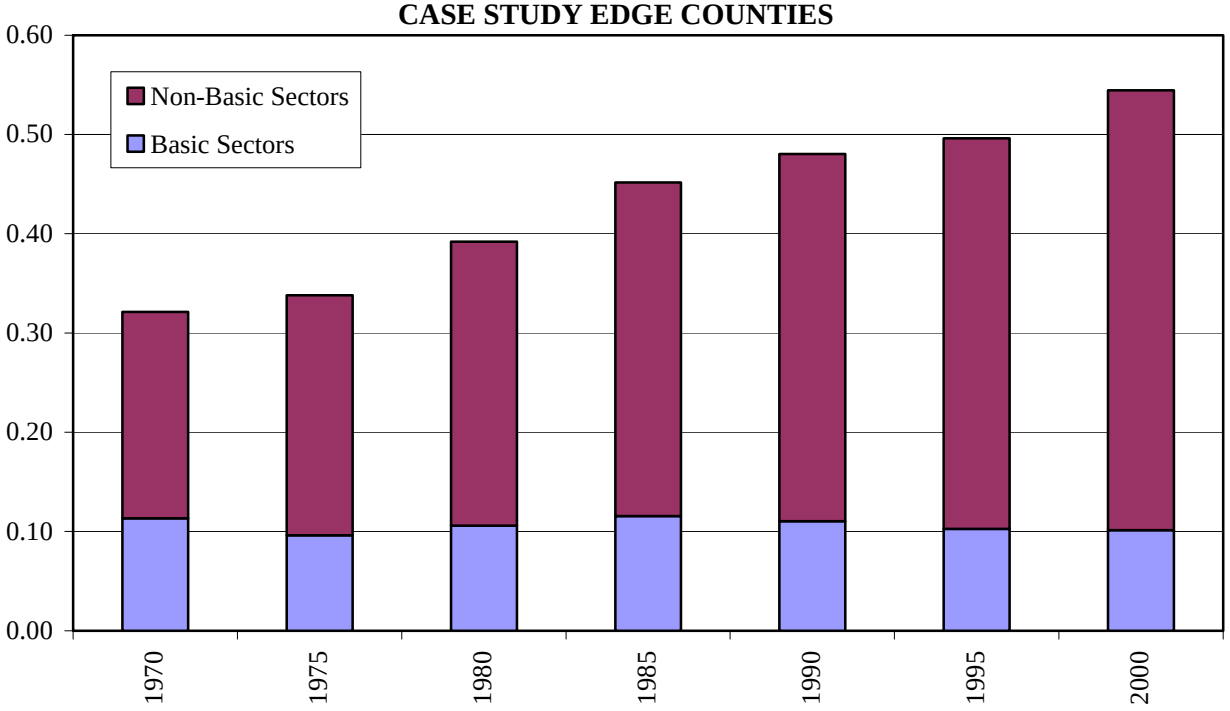
Source: Applied Economics.

The evidence confirms the claim that with initial population growth in the younger counties, despite the dampening effect of adding older counties, non-basic population-serving employment growth increases to meet market demand. After non-basic employment growth, basic employment growth increases because of the formation of an independent market area and a growing labor force. In succeeding periods, both basic and non-basic employment is likely to grow because of initial population growth. In short, both basic and non-basic jobs eventually follow people and for quite some time.

The actual number of jobs that followed case study edge county population growth over time are exhibited in Figure 3-3. From 1970 to 2000, three important facts about employment growth emerged:

- The total jobs-to-population ratio increased from just over 0.30 to nearly 0.55. Note the table illustrates the average between older and younger case study edge counties.
- The number of basic jobs-to-people remained relatively unchanged.
- The number of non-basic jobs-to-people drove the increase in the total number of jobs-to-population ratio.

FIGURE 3-3
BASIC AND NON-BASIC EMPLOYMENT-TO-POPULATION RATIOS
CASE STUDY EDGE COUNTIES



Sources: U.S. Census Bureau, Bureau of Economic Analysis, Applied Economics.

This section has shown that with periods of population growth there is non-basic employment growth and basic employment growth follows after a five-year lag. This process continues over the development cycles of typical case study edge counties. Total employment-to-population ratios ended up increasing because of non-basic employment growth. Basic employment-to-population ratios remained more or less unchanged. These results imply that at market thresholds a continued path of increased non-basic employment growth relative to population growth is likely.

3.1.3 Employment, Population Size, and Market Thresholds

Determining market thresholds begins with choosing a sample of case study edge counties. The counties considered include younger counties that experienced both high population and employment growth, but whose employment growth was greater than population growth. The sample consists of Gwinnett County, Georgia, Seminole County, Florida, and Collin County, Texas. Population, basic, and non-basic growth are indexed to 1970 and indexed trends are examined.

Table 3-4 presents the results of the indexed growth trend analysis. The population and employment thresholds were determined by choosing the range of population and employment levels when non-basic employment began to grow disproportionately faster than population and basic employment. The results suggest population thresholds range between 150,000 and 250,000, corresponding to an employment range of 50,000 and 120,000.

TABLE 3-4
MARKET THRESHOLDS
SAMPLE OF CASE STUDY EDGE COUNTIES

County	Population Threshold Range	Employment Threshold Range
Gwinnett County, Georgia	200,000 - 250,000	80,000 - 120,000
Seminole County, Florida	150,000 - 200,000	55,000 - 75,000
Collin County, Texas	175,000 - 225,000	50,000 - 75,000

Source: Applied Economics

The thresholds, in the high-growth counties, show that when the number of residents reaches between 150,000 and 250,000, non-basic employment growth begins to outpace population growth. Despite reaching sustained high non-basic employment growth relative to population growth, basic employment growth still remains more or less equal to population growth. The similar growth rates result in the constant basic employment-to-population ratio. At market thresholds, the overall lag between population and total employment growth begins to steadily decline.

3.1.4 Employment Growth by Sector

The previous sections highlight the lag between population and total employment growth. This section presents evidence of the changes that are occurring in basic and non-basic sectors that result in basic, non-basic, and total employment-to-population ratio behavior over time. In Appendix A, Table A-1 presents average sector employment-to-population ratios for case study edge counties. The following facts emphasize the main results of the Table.

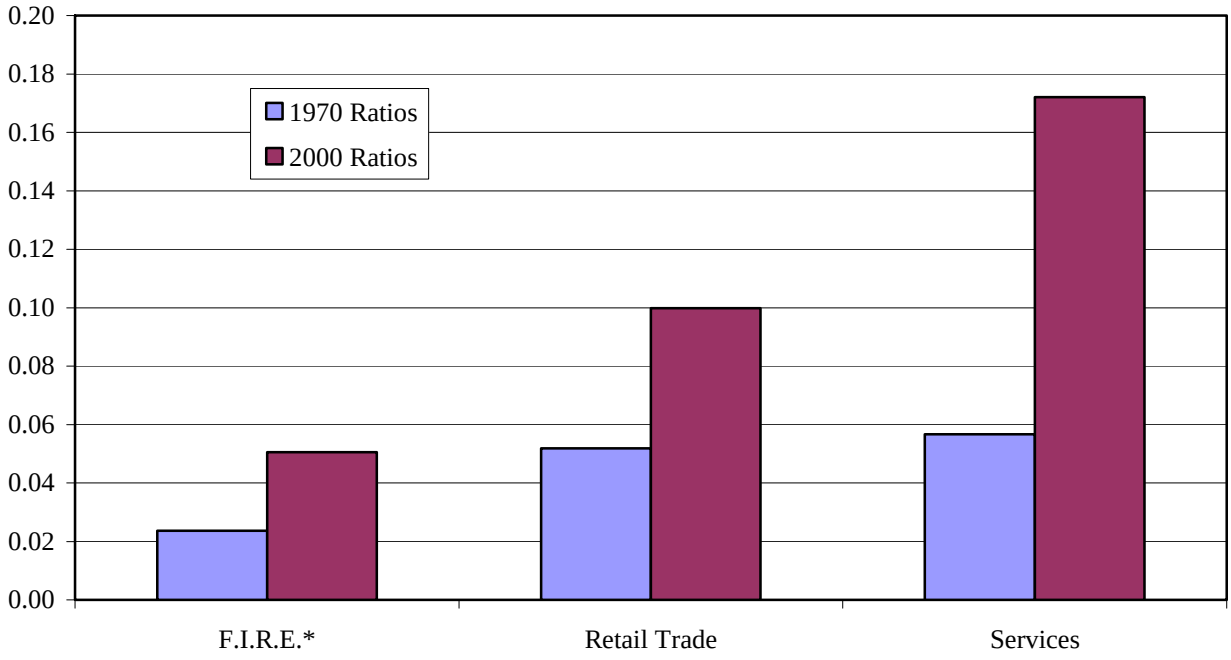
- From 1975 to 2000, the total employment-to-population ratio appreciated from 0.32 to 0.55.
- With the exception of wholesale trade, most basic industry sectors experienced declining sector employment-to-population ratios.
- Manufacturing sector decline was the sharpest, decreasing from 0.06 to 0.04 from 1970 to 2000.
- The agriculture sector's decline, similar to the public sector, was less steep, declining from 0.02 in 1970 to 0.01 by 2000.
- The mining sector ratio remained unchanged.
- Retail trade and service sectors, which are both non-basic, witnessed the largest appreciation in employment-to-population ratios. From 1970 to 2000, the retail trade sector ratio increased

from 0.05 to 0.10, and the service sector ratio increased from 0.06 to 0.17. Indeed, all non-basic sectors saw their employment-to-population ratios increase.

- Recession years normally witness declines in employment-to-population ratios. The comparison of different points in the business cycle may account for some of the variability in the ratios.

Figure 3-4 illustrates the strongest sources of the growth in jobs-to-population ratios over the development cycle.

FIGURE 3-4
SECTORS WITH THE LARGEST NET GAINS IN OF JOBS-TO-POPULATION RATIOS
CASE STUDY EDGE COUNTIES



Sources: U.S. Census Bureau; Bureau of Economic Analysis; Applied Economics.
* Finance, Insurance, and Real Estate

Another caveat, besides the pooling of older and younger county sector changes, arises here. The structure of the macroeconomy transformed into one that became heavily services based from 1970 to 2000. The free flow of goods and capital across borders resulted in the decline of certain industries, especially those within the manufacturing sector, over the period and still today.

3.2 Pinal County

The recent population and employment growth history of Pinal County has been very different from the experiences of the typical edge county.

3.2.1 Basic and Non-Basic Employment Growth

Table 3-7 exhibits population growth and total, basic, and non-basic employment growth since 1970. Basic employment growth from 1970 to 2000 was volatile; periods of high growth were followed by negative growth and vice versa. The negative employment growth in basic employment in 1995 to 2000 was severe enough to yield a negative total employment growth rate. Non-basic employment growth grew every half-decade until 1995 to 2000, when it fell to 10.8 percent from 26.1 percent.

TABLE 3-7
POPULATION AND EMPLOYMENT GROWTH FROM 1970 to 2000
PINAL COUNTY

Years	Population Growth	Employment Growth	Basic Employment Growth	Non-Basic Employment Growth
1970-1975	22.19%	21.04%	27.40%	15.05%
1975-1980	8.49%	1.43%	-15.57%	19.18%
1980-1985	13.54%	5.57%	-18.24%	23.17%
1985-1990	12.76%	23.45%	19.46%	25.40%
1990-1995	25.32%	21.35%	11.16%	26.12%
1995-2000	23.22%	-0.38%	-27.52%	10.80%

Sources: U.S. Census Bureau; Bureau of Economic Analysis;
Applied Economics.

3.2.2 Employment Growth by Sector

In the Appendix, Table A-2 presents sector employment-to-population ratios in Pinal County from 1970 to 2000. The total employment-to-population ratio plummeted from a high of 0.38 in 1970 to only 0.28 in 2000. The situation is even worse today. The source of the decline in total employment-to-population was the collapse of basic sectors, especially mining and agriculture. The only basic sectors that experienced appreciating ratios were wholesale trade and public administration. Moreover, the appreciation of the wholesale trade employment-to-population ratio amounted to less than four new jobs per 1,000 people. The service sector led the non-basic ratio higher; other non-basic sectors remained relatively unchanged or experienced ratio declines. By 2000, only 25 non-basic sectors jobs were added countywide per 1,000 people. In short, jobs are lagging significantly behind population growth.

The lag of job growth in the county is highly unusual. Case study edge county evidence suggests basic and non-basic employment growth usually follows population growth for several years. Basic employment growth is enough to maintain a more or less constant basic employment-to-population ratio. Non-basic employment growth drives the total employment-to-population ratio higher. As the population grows, the source of growth in employment is because of non-basic employment growth. None of this has happened in Pinal County.

4.0 LOCATION FACTORS

The previous sections covered the nature of the lag between employment and population in case study edge counties. The purpose of this section is to discuss the business climate factors that may have enabled case study edge counties to achieve stronger employment growth relative to population growth.

4.1 Growth Rankings

The case study edge counties have experienced about 30 years of moderate to strong growth. The Denver, Atlanta, Los Angeles, San Diego, Dallas, and Orlando areas have expanded for decades, pushing metropolitan boundaries further out to areas once considered rural. Edge counties in these areas have undergone tremendous change. Over a thirty-year period, the edge counties have transformed into urban extensions of the central counties. The experience, however, has been more dramatic for a select group of counties.

TABLE 4-1
POPULATION AND EMPLOYMENT GROWTH RANKINGS
CASE STUDY EDGE COUNTIES

Rank	Population Growth*	Employment Growth*
1	Gwinnett County, Georgia	Gwinnett County, Georgia
2	Collin County, Texas	Collin County, Texas
3	Denton County, Texas	Seminole County, Florida
4	Seminole County, Florida	Arapahoe County, Colorado
5	Riverside County, California	Denton County, Texas
6	Cobb County, Georgia	Cobb County, Georgia
7	Arapahoe County, Colorado	Riverside County, California
8	San Bernardino County, California	Adams County, Colorado
9	Adams County, Colorado	San Bernardino County, California
10	DeKalb County, Georgia	DeKalb County, Georgia

Source: U.S. Census Bureau; Bureau of Labor Statistics; Applied Economics.
* Indexed to base year (1970 = 100)

Table 4-1 presents population and employment growth rankings for the case study edge counties. Growth is indexed to 1970 as a base year. The strongest growth in both population and employment was seen in Gwinnett County, Georgia followed by Collin County, Texas. While Denton County, Texas was the third fastest growing county in terms of population, it was fifth among the counties in employment growth. Seminole County, Florida, just north of Orlando, was the fourth fastest growing county in terms of population and third in employment growth. Riverside County, California rounded out the top five counties in population growth, but was seventh in employment growth.

4.2 Factors

Business climate factors present in the top four high-growth counties that experienced stronger employment growth relative to population growth are discussed.

Gwinnett County, Georgia's growth is likely to have been positively influenced by the several interstates and major highways located in or near the county. Interstates 85, 985, and 285, as well as three major U.S. Highway routes, enabled easier access to area jobs and mass transit. Accessibility to major education institutions has been a concern to many of the metropolitan area's residents. A "Brain Train" has been proposed to link institutions of higher education in the City of Atlanta with Gwinnett County's colleges and technical school and the University of Georgia in Athens. Utilizing the area's transportation networks to further educational attainment should lead to further improvements in the number and quality of jobs per person in the county.

Like Gwinnett County, Georgia, Collin County, Texas desires to further improve not only the quantity but also the quality of the jobs in the county. The county has planned two major business/technology parks. While the parks are attractive to business, ample recreation and entertainment options, as well as strong public schools, are attractive to families and residents that can afford the area. Businesses have found the highly educated workforce and business incentives enticing.

Ease of access to Denver and its amenities have led to strong population growth in Arapahoe County, Colorado. Three airports, including Denver International directly to the north of the county, and light rail expansion initiatives are likely to increase employment opportunities. Although higher education opportunities are more limited, accessibility to the many Denver area community colleges, technical schools, colleges, and universities is beneficial.

Seminole County, Florida, like the other high growth counties, has strong education attainment. The county attracts a highly educated workforce and has the highest education attainment for a county in the Orlando metropolitan area. Resident's may be attracted to the county's strong public schools, but they are also probably attracted to the numerous entertainment and recreation opportunities. The county boasts several protected wilderness areas and interstate access to the region's famous attractions. A pro-business atmosphere with low taxes and strong incentives and the presence of the Orlando-Sanford International Airport within the county are welcoming to businesses.

Table 4-2 presents a brief summary of factors that are likely to encourage stronger employment and population growth. Their presence may increase commercial and industrial development relative to residential development. The factors are common to all high-growth, high employment-to-population ratio counties.

The Atlanta metropolitan area has many examples of counties that have been undergoing, or are trying to prevent, bedroom community development. Haralson County, with about 30,000 residents has similarities to a younger Pinal County. Employment was primarily focused in one basic industry and it is located between major urban areas.

The successes witnessed in places like Collin County, Texas are the result of places like Haralson County's preemptive actions. Similar to the Pinal County experience, Haralson County lost its main source of employment. Textile mills and factories that closed over the past 25 years left thousands without jobs. A local county government figure credited the attraction of new industry to the area to the development of adequate infrastructure to handle industrial growth. New business and industry representatives credited their move to Haralson County on a number of factors including infrastructure, location between and accessibility to both Atlanta and Birmingham, Alabama, good public schools, the establishment of and strong enrollment in the West Central Technical College, environmental integrity, business park development and strong incentives.[2]

[2]Young, Ben. "Haralson County: Doing It Up Right," *Georgia Trends Magazine*, December 2005.

TABLE 4-2
CASE STUDY EDGE COUNTY LOCATION FACTORS

Factor		Details
Education Attainment		♦ Strong public schools ♦ Technical schools and community colleges ♦ Colleges and universities ♦ Educated workforce
Accessibility		♦ Interstates ♦ Thorough highway networks ♦ Public transportation ♦ Airports: municipal, regional, and/or international ♦ Heavy rail ♦ Passenger rail
Pro-Business Environment		♦ Low taxes ♦ Strong incentives ♦ Technology and business park development ♦ Strong communities
Quality of Life		♦ Recreation opportunities, preservation of green space ♦ Parks ♦ Sports ♦ Malls, shopping ♦ Cultural institutions

5.0 THE EDGE CITY EXPERIENCE

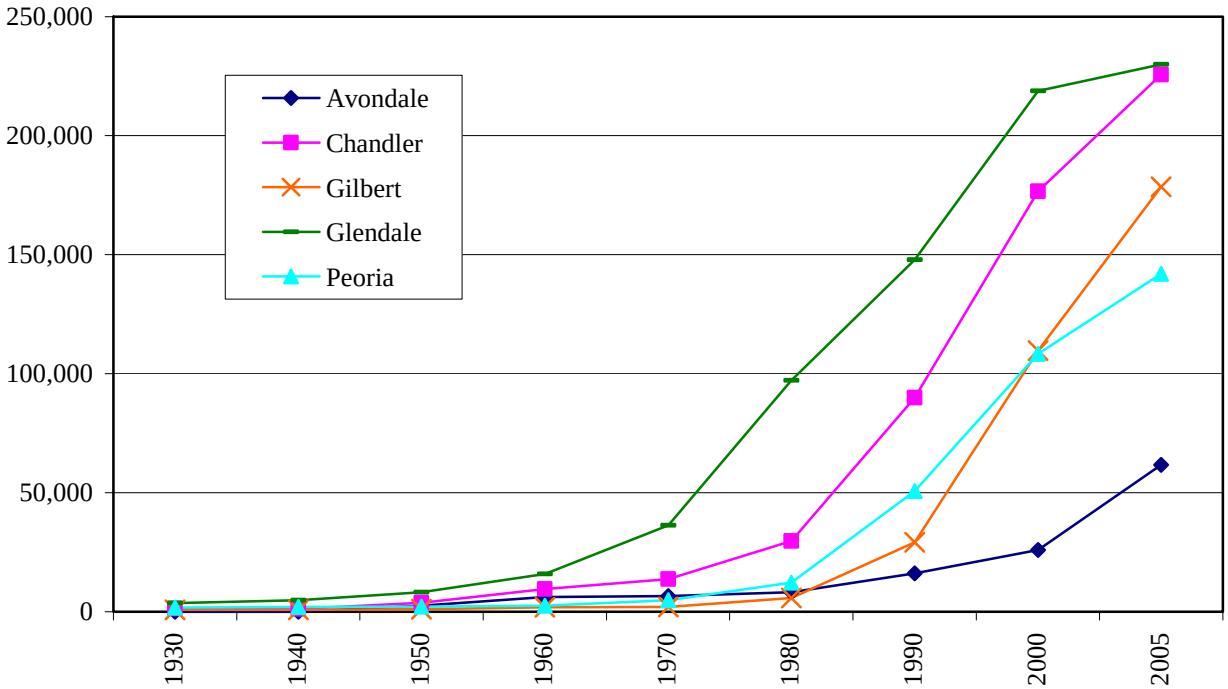
The purpose of this section is to evaluate the population and employment city-level experience. The evaluation is an analysis of population and employment ratios for cities in Maricopa County that were once edge cities and are now urbanized and pushing the Phoenix metropolitan boundary further outward. The analysis combined with results from the previous sections in this paper provide a context in which to understand city-level growth in Pinal County and further support projections for future countywide growth.

5.1 Population Growth

As recently as 1950, the City of Phoenix and Maricopa County had a little over 105,000 and 330,000 residents, respectively. Fifty years later, Phoenix and Maricopa County reached 1,321,045 and 3,072,149 residents, respectively. Cities that were once exurban grew into urban extensions of the City of Phoenix and are now collectively pushing the Phoenix-Scottsdale-Mesa MSA well beyond Maricopa County into Yavapai and Pinal Counties.

The rural-to-urban growth cities are the most appropriate for comparisons with Pinal County cities. Examples of cities undergoing such transformation in Maricopa County include Avondale, Chandler, Gilbert, Glendale, and Peoria. Tempe, Scottsdale, and Mesa are not considered cities that grew primarily because of metropolitan expansion, though they have been certainly affected by it.

FIGURE 5-1
TOTAL POPULATION
MARICOPA COUNTY EDGE CITIES



Source: U.S. Census Bureau; Arizona Department of Economic Security.

APPLIED ECONOMICS

Figure 5-1 depicts 75 years of population growth in Maricopa County's edge cities from 1930 through 2005. The data presented supports several conclusions

- Population growth was slow to moderate for several decades
- Population growth became pronounced very quickly; after a decade of moderate growth, edge cities began to experience very rapid increases in population levels
- Strong population growth typically lasted three decades
- The rate of population growth at different stages of development was similar across cities
- After close to three decades of strong population growth, cities likely to be approaching build-out saw decreasing population growth rates
- Cities in the western half of the metropolitan area have grown later and to a lesser extent than cities in the eastern half of the Valley

Glendale, adjacent to Phoenix's west side, saw very strong population growth from 1970 through 2000. Population slowly increased until expansion rapidly increased development and urbanization. Almost thirty years of strong growth subsided by 2000 as the area began approaching build-out on many fronts. Growth is now bounded by a lack of developable land.

Peoria's location, bordering Glendale to the north and west and bordered by Sun City to the west, experienced a similar development pattern almost two decades after Glendale's initial steady growth. The lag behind Glendale is likely the result of the time necessary for development within Glendale, and a lack of infrastructure in Peoria. Glendale functioned as a separating city between Peoria and Phoenix. As Glendale became increasingly developed, businesses and residents began to move to Peoria. The period from 1980 to 1990 was the initial growth increase and 1990 to 2000 was the strongest period of growth in the city.

Chandler exhibits a growth pattern similar to Glendale. Indeed, it appears all of the edge cities have or are expected to have similar growth rates at the peak of their urbanization. From 2000 onward, Chandler's total population growth slowed from the previous decade's high, as the city grew out to its bounds.

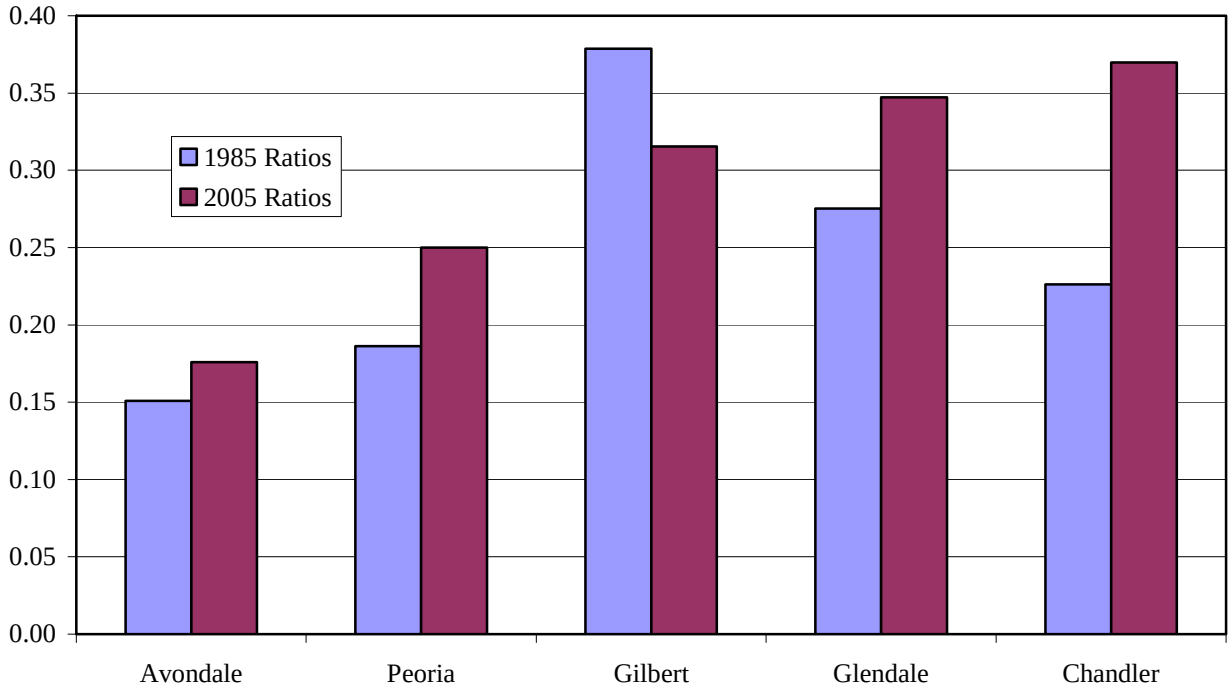
Gilbert, sharing borders with Chandler and Mesa, began to experience strong growth by about 1990. The city's growth pattern is similar to Glendale and Chandler but more lagged. Note also that the area has seen over 16 years of very strong growth. Based on historical patterns seen in Glendale and Chandler, it is likely that the area will experience continued growth. Growth should begin to decline as developable land becomes scarce, pushing growth into less developed areas of Mesa, Queen Creek, and Pinal County

Another noticeable feature of Figure 5-1 is that cities in the western half of the metropolitan region have grown later and to a lesser extent than cities in the eastern half of the Valley. The amount of developable land will be the key to growth, as development in the region is less dense than in a typical metropolitan area. The development of an urban core in Mesa will likely lead to the rapid urbanization of Queen Creek, Apache Junction, and other areas of northwestern Pinal County.

5.2 Employment-to-Population Ratios

Figure 5-2 presents the employment-to-population ratios for historical bedroom communities within Maricopa County. With the exception of one city, all cities have experienced increases in their employment-to-population ratios. The older, more developed cities have experienced steady upward trends in their ratios since 1985. Younger, less developed cities have seen smaller gains or a drop, early in their development, from which they are recovering. These younger areas are experiencing the transition from a rural-based economy to the urban-based metropolitan area economy.

FIGURE 5-2
METROPOLITAN AREA
1985 AND 2005 EMPLOYMENT-TO-POPULATION RATIOS



Sources: Maricopa Association of Governments; Applied Economics.

Avondale, the youngest and least populated of the cities, still has a low employment-to-population ratio. Table A-3 (see Appendix) shows that the ratio of employment-to-population in Avondale exhibits some cyclicality. Peoria has the second smallest population and second smallest employment-to-population ratio. Over time, Peoria's ratio has trended upward and has never decreased, adding over 60 jobs per 1,000 residents from 1985 to 2005. Gilbert's strong growth began from 1985 to 1990. Over this same period, Gilbert's employment-to-population ratio fell from 0.38 to 0.17. Since 1990, Gilbert's employment-to-population ratio has rebounded to about 0.32. Glendale and Chandler, the two most populated and developed cities, have the two highest employment-to-population ratios. Both Glendale and Chandler have ratios near or above 0.35, up from 0.28 and 0.23, respectively. The evidence reveals that despite two decades of extremely strong population growth, all cities have experienced appreciations in their employment-to-population ratios.

APPENDIX

TABLE A-1
EMPLOYMENT-TO-POPULATION RATIOS BY SIC SECTOR FROM 1970 TO 2000
CASE STUDY COUNTY AVERAGES

Year	Employment -to- Population	Agriculture Employment -to- Population	Mining Employment -to- Population	Construction Employment -to- Population	Manufacturing Employment -to- Population	T.P.U. Employment -to- Population*	Wholesale Trade Employment -to- Population	Retail Trade Employment -to- Population	F.I.R.E. Employment -to- Population**	Services Employment -to- Population	Public Administration Employment -to- Population***	Basic Employment -to- Population****	Non-Basic Employment -to- Population
1970	0.321	0.016	0.002	0.021	0.059	0.011	0.013	0.052	0.024	0.057	0.067	0.113	0.208
1975	0.338	0.013	0.002	0.022	0.044	0.013	0.017	0.059	0.031	0.068	0.068	0.096	0.242
1980	0.392	0.012	0.003	0.029	0.053	0.017	0.023	0.074	0.037	0.082	0.064	0.106	0.286
1985	0.452	0.011	0.005	0.037	0.055	0.019	0.030	0.089	0.041	0.107	0.059	0.115	0.336
1990	0.480	0.010	0.003	0.032	0.048	0.022	0.034	0.091	0.040	0.137	0.062	0.110	0.370
1995	0.496	0.010	0.003	0.034	0.044	0.026	0.034	0.098	0.038	0.151	0.059	0.103	0.394
2000	0.545	0.010	0.002	0.044	0.043	0.030	0.036	0.100	0.051	0.172	0.057	0.101	0.443

Sources: U.S. Census Bureau; Bureau of Economic Analysis; Applied Economics

* T.P.U. = Transportation and Public Utilities

** F.I.R.E. = Finance, Insurance, and Real Estate

*** Public Administration includes Federal Civilian, Military, and State and Local Government

**** Basic Employment is defined as Agriculture, Mining, Manufacturing, Wholesale Trade, and Federal Civilian/Military

TABLE A-2
EMPLOYMENT-TO-POPULATION RATIOS BY SIC SECTOR FROM 1970 TO 2000
PINAL COUNTY

Year	Employment -to- Population	Agriculture Employment -to- Population	Mining Employment -to- Population	Construction Employment -to- Population	Manufacturing Employment -to- Population	T.P.U. Employment -to- Population*	Wholesale Trade Employment -to- Population	Retail Trade Employment -to- Population	F.I.R.E. Employment -to- Population**	Services Employment -to- Population	Public Administration Employment -to- Population***	Basic Employment -to- Population****	Non-Basic Employment -to- Population
1970	0.379	0.058	0.089	0.031	0.022	0.009	0.003	0.045	0.010	0.037	0.077	0.184	0.195
1975	0.375	0.045	0.098	0.012	0.030	0.009	0.008	0.044	0.012	0.035	0.083	0.192	0.184
1980	0.351	0.035	0.068	0.009	0.030	0.011	0.007	0.045	0.015	0.038	0.094	0.149	0.202
1985	0.326	0.029	0.034	0.015	0.030	0.011	0.006	0.049	0.017	0.047	0.090	0.107	0.219
1990	0.357	0.030	0.035	0.012	0.032	0.013	0.007	0.052	0.016	0.058	0.102	0.114	0.243
1995	0.346	0.023	0.033	0.015	0.028	0.008	0.009	0.052	0.013	0.064	0.102	0.101	0.245
2000	0.280	0.018	0.008	0.011	0.019	0.006	0.007	0.044	0.014	0.063	0.090	0.059	0.220

Sources: U.S. Census Bureau; Bureau of Economic Analysis; Applied Economics.

* T.P.U. = Transportation and Public Utilities

** F.I.R.E. = Finance, Insurance, and Real Estate

*** Public Administration includes Federal Civilian, Military, and State and Local Government

**** Basic Employment is defined as Agriculture, Mining, Manufacturing, Wholesale Trade, and Federal Civilian/Military

TABLE A-3
EMPLOYMENT-TO-POPULATION RATIOS
HISTORICAL BEDROOM COMMUNITIES

City	1985	1990	1995	2000	2005
Avondale	0.15	0.26	0.15	0.24	0.18
Chandler	0.23	0.30	0.35	0.38	0.37
Gilbert	0.38	0.17	0.26	0.29	0.32
Glendale	0.28	0.32	0.34	0.37	0.35
Peoria	0.19	0.17	0.20	0.25	0.25

Sources: Maricopa Association of Governments; Applied Economics.