



# AGGREGATE ECONOMIC GROWTH IN ARIZONA SINCE 2007

**January 2015**

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**A Report from the Productivity and Prosperity Project (P3),  
Supported by the Office of the University Economist**

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ARIZONA STATE UNIVERSITY

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## SUMMARY

This paper focuses on aggregate economic growth, as measured by indicators such as gross domestic product and employment. This concentration on aggregate growth should not be interpreted as meaning that aggregate growth is of primary significance. Indeed, the goal of economic development is to enhance productivity and prosperity, not to grow faster. There is no relationship between aggregate growth rates and gains in productivity and prosperity and areas that grow rapidly have more extreme economic cycles. This paper focuses on aggregate growth because it is aggregate growth in Arizona since 2007 that is so out of line with Arizona's historical record and with national growth rates. Relative to the national average, changes in productivity and prosperity during this period in Arizona are not much different from the historical norm.

Typically, aggregate economic growth in Arizona is much faster than the national average during economic expansions and about the same as the U.S. average during recessions. However, the last recession in Arizona was longer and deeper than the national average. Since the recovery began in 2010, the Arizona economy has grown slowly relative to both the national average and the state's historical norm.

Among the factors contributing to the slow aggregate growth of the Arizona economy since 2007 is the real estate bust that followed the boom of the mid-2000s. Among 20 large metropolitan areas, the real estate cycle was most pronounced in seven metro areas in four states: Phoenix, Las Vegas, Los Angeles, San Diego, San Francisco, Miami, and Tampa.

Arizona is not alone in its unusually slow rate of growth relative to its historical norm and to the nation. Only North Dakota, due to an oil boom, has posted substantially faster growth than the national average in recent years; the range in employment growth rates across the states has been unusually narrow since the end of the employment recession in 2010. Among the states most affected by the real estate boom and bust, neighboring Nevada's aggregate annual percent changes have been lower than those of Arizona throughout the recession and recovery. Growth rates in Florida have been only a little higher than those in Arizona. Recoveries from crashes in real estate and other investments take a long time.

In order for economic growth in Arizona to become more rapid and considerably stronger than the national average, as in prior cycles, growth rates need to increase in most of the key basic activities. So far in this recovery, only finance and insurance is outperforming the nation by a significant margin. Tourism is showing signs of improvement. In contrast, growth rates in basic activities in the administrative support sector and in the professional, scientific and technical service sector will need to strengthen and high-technology manufacturing job losses will need to reverse.

In the most likely scenario, aggregate economic growth in Arizona will accelerate over the next few years, with a sharp acceleration a possibility. If not before, then after the next national economic downturn, annual numeric employment and population increases should return to the levels of the 1981-90 cycle or somewhat higher. The alternative scenario is that gains in Arizona and other Sunbelt states will not reach historical levels, though these states likely will continue to grow somewhat faster than the national average.



## INTRODUCTION

Aggregate economic growth in Arizona since the onset of the last recession is examined in this paper, with comparisons made to the nation and to other states. Economic growth during this period also is compared to the state's historical record. The prospects for growth in Arizona in the coming years are then assessed.

This paper focuses on aggregate economic growth, as measured by indicators such as gross domestic product (GDP) and employment. This concentration on aggregate growth should not be interpreted as meaning that aggregate growth is of primary significance. Indeed, the goal of economic development is to enhance productivity and prosperity, not to grow faster. There is no relationship between aggregate growth rates and gains in productivity and prosperity and areas that grow rapidly have more extreme economic cycles.<sup>1</sup> This paper focuses on aggregate growth because it is aggregate growth in Arizona since 2007 that is so out of line with Arizona's historical record and with national growth rates. Relative to the national average, changes in productivity and prosperity during this period in Arizona are not much different from the historical norm.

The last recession, which is officially dated by the National Bureau of Economic Research as beginning in January 2008 and ending in June 2009, was the worst economic recession nationally since the Great Depression of the 1930s in terms of the length and depth of the declines. Declines in employment continued into 2010.

Typically, aggregate economic growth in Arizona is much faster than the national average during economic expansions and about the same as the U.S. average during recessions. However, the last recession in Arizona was longer, beginning before and lasting beyond the national dating, and deeper than the national average. Since the recovery began in 2010, the Arizona economy has grown slowly relative to both the national average and the state's historical norm.

Comparisons of economic growth over time and relative to other geographic areas generally are made using percent changes.<sup>2</sup> However, an analysis of percent changes is limited by two factors:

- Percent changes become smaller as the base becomes larger. For example, a particular numeric increase in employment will result in a smaller percent change now than in the past.
- Economic growth is cyclical. Growth rates in a particular year need to be compared to prior years at a similar point in the economic cycle.

Arizona's economy is more cyclical than the national average, but the timing of the cycle in Arizona generally is nearly the same as the nation. Thus, using the difference between Arizona and the United States in the percent change in economic measures helps to control for the economic cycle. However, even the difference in the economic growth rate between Arizona and

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<sup>1</sup> For more information on such topics, see the November 2014 report "Overview of Economic Competitiveness: Business and Individual Location Factors, With a Focus on Arizona," <https://wpcarey.asu.edu/sites/default/files/uploads/center-competitiveness-and-prosperity-research/competitiveness11-14.pdf>.

<sup>2</sup> For measures such as employment and population, the numeric change over time in a specific geographical area also can be compared.

the nation displays cyclical, and the difference in the percent growth rates between Arizona and the nation is narrowing over time as Arizona grows faster than the nation.

Among the factors contributing to the poor performance of the Arizona economy since 2007 is the real estate bust that followed the boom of the mid-2000s. The extreme real estate cycle is examined first.

### **THE REAL ESTATE BOOM AND BUST**

The S&P/Case-Shiller Home Price Index, produced by S&P Dow Jones Indices, tracks the value of single-family housing in the United States and in 20 large metropolitan areas. The information provided by S&P Dow Jones Indices is limited to index values; dollar values are not available. Nationally, the index starts in January 1987; the first data for the Phoenix metropolitan area are for January 1989. The latest data are for October 2014.

#### **Monthly Index**

On a monthly basis, home values peaked in February 2007 nationally, with the low point occurring in December 2011. In most of the 20 metro areas, the peak occurred between spring 2006 and spring 2007 (May 2006 in Phoenix) and the trough was between spring 2011 and spring 2012 (August 2011 in Phoenix).

The Case-Shiller Index indicates that the real estate boom and bust (and subsequent recovery) was most pronounced in seven metro areas in four states: Phoenix, Las Vegas, Los Angeles, San Diego, San Francisco, Miami, and Tampa. Each of these metro areas had an increase in home values between the end of the 2001<sup>3</sup> and the peak in excess of 72 percent, compared to the national average of 59 percent. The increase in Phoenix was 104 percent, less than in Miami, Los Angeles, and Las Vegas. The Case-Shiller Home Price Index for the Phoenix metropolitan area since the end of 2001 is compared to the nation and to the Las Vegas metro area in Chart 1.

From the peak to the trough, values fell by at least 40 percent in each of these seven metro areas, compared to a national average decrease of 26 percent. The drop in Phoenix was 57 percent, exceeded only by Las Vegas. Through October 2014, values have increased at least 30 percent in each of these seven areas since the trough, compared to 22 percent nationally. The 48 percent rise in Phoenix is third highest, behind Las Vegas and San Francisco.

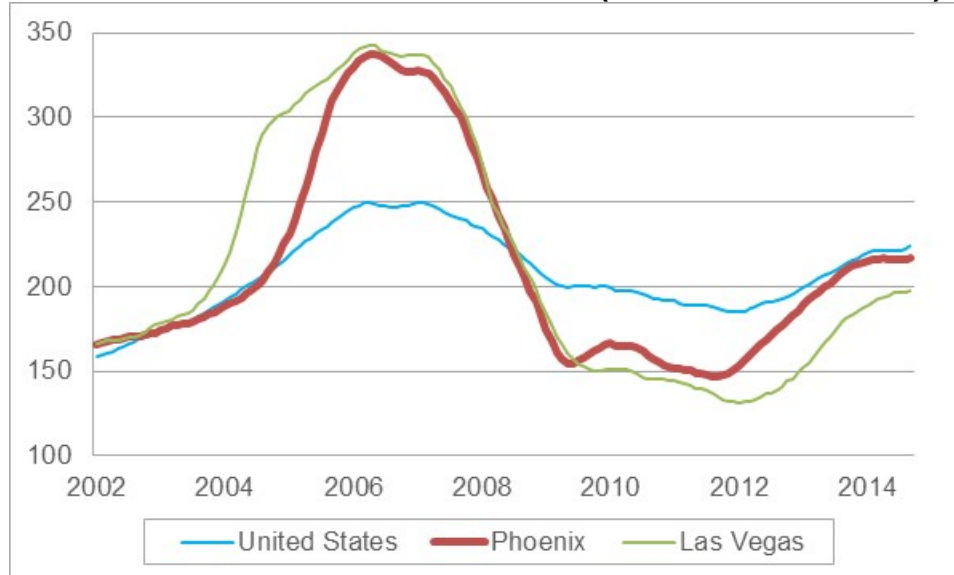
The Portland, Seattle, Washington DC, and New York City metro areas also had above-average price increases during the boom. However, these metros experienced losses during the bust similar to the national average. Gains since the trough have ranged from below average in New York to a little above average in Portland and Seattle.

Despite the strong gains in price since the trough, the values in Phoenix and Las Vegas in October 2014 relative to the peak still were the lowest of the 20 metro areas. Over the longer time period going back to the end of 2001, most of the metros that experienced a severe boom and bust have an above-average gain in home values. However, Phoenix, Tampa, and especially Las Vegas have gains below the national average.

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<sup>3</sup> The end of 2001 was selected as the base since year-over-year price appreciation nationally slowed during the 2001 recession from more than 9 percent to less than 7 percent.

**CHART 1**  
**CASE-SHILLER HOME PRICE INDEX (JANUARY 2000 = 100)**



Source: S&P Dow Jones Indices, Case-Shiller Home Price Index, <http://us.spindices.com/index-family/real-estate/sp-case-shiller>.

### Annual

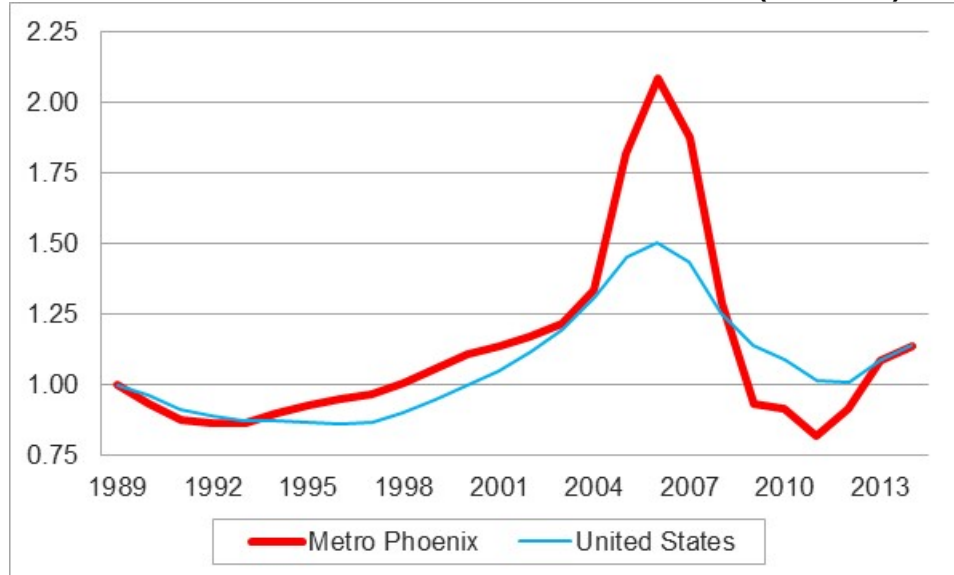
A better understanding of the behavior of the residential real estate market can be gained by adjusting the Case-Shiller Index by the overall inflation rate, as measured by the U.S. GDP implicit price deflator, or by income, as measured by per capita personal income (PCPI). Since the latter data are only available annually, the monthly Case-Shiller Index was converted into an annual index.

Adjusted for inflation, home values nationally fell from 1989 through 1996, with a cumulative decline of 14 percent. Gains in home values exceeded the inflation rate in each year from 1997 through 2006, with the strongest inflation-adjusted increases occurring in 2004 and 2005. In 2006, inflation-adjusted home values were 51 percent higher than in 1989 (and 75 percent higher than in 1996). Six consecutive years of declines followed, with real values in 2012 dropping back to the 1989 level. Moderate increases followed in 2013 and 2014 (the average for the first 10 months), though the monthly data indicate the rate of increase slowed throughout 2014.

In the Phoenix metro area, the swings in home prices have been much more extreme than the national average, as seen in Chart 2. In 2006, after adjusting for inflation, home values had increased 109 percent compared to 1989. In 2011, adjusted values were 18 percent less than in 1989. In 2014, prices had bounced back to be 14 percent higher than in 1989, the same increase from 1989 as the nation. Thus, over 25 years, home prices nationally and in the Phoenix area increased an average of a little more than 0.5 percent per year more than the inflation rate.

Per capita personal income was converted to an index, with the average of 1999 and 2000 set equal to 1 in order to be consistent with the Case-Shiller Index, which is set equal to 100 in

**CHART 2**  
**INFLATION-ADJUSTED HOME PRICE INDEX (1989 = 1)**



Source: Calculated from S&P Dow Jones Indices, Case-Shiller Home Price Index, <http://us.spindices.com/index-family/real-estate/sp-case-shiller> and U.S. Department of Commerce, Bureau of Economic Analysis (GDP implicit price deflator).

January 2000. The ratio of the Case-Shiller Index to the PCPI index was calculated annually; a value of more than 100 indicates that home values relative to income were higher in that year than in the base period. Nationally, the ratio reached 121 in 1988, fell to 97 in 1998, rose to 142 in 2006, and fell to 95 in 2012. The 2013 ratio was 102.

The fluctuations were more extreme in the Phoenix area, with a trough of 95 in 1993, a peak of 169 in 2006, and a trough of only 76 in 2011. The 2013 ratio was 100. Thus, home values rose substantially more than income from the late 1990s through 2006, but dropped between 2006 and 2011 more than needed to return to equilibrium. As a result, the ratio rose considerably between 2011 and 2013.

### **AGGREGATE ECONOMIC GROWTH VERSUS GAINS IN PRODUCTIVITY AND PROSPERITY**

Aggregate measures of the economy, such as GDP and employment, are most commonly examined. However, dollar measures of productivity and prosperity are superior measures of economic performance. Prosperity is measured on a per person basis and includes such measures as per capita personal income. True measures of productivity are not available at a subnational level, but per employee measures, such as per employee GDP, serve as proxies.

On measures of prosperity and productivity, Arizona historically has displayed a cyclical pattern relative to the nation. Arizona's performance typically is worse than the nation during recessions (or more precisely, from the late stage of an expansion through the early stage of a recovery) but somewhat better than the nation during economic expansions.

During the last recession, Arizona's performance on measures of prosperity and productivity was in line with the historical record, with losses larger than the national average. Since the end of the recession, Arizona has continued to lose ground to the nation, but at a slower pace. Thus, through 2013, Arizona had not begun to offset its productivity and prosperity losses relative to the nation that occurred during the recession. The changes in the productivity and prosperity measures since the end of the recession, while subpar relative to the U.S. average, are not markedly different from the historical record.

In contrast, Arizona's aggregate growth rates during the recession and recovery are highly uncharacteristic. The losses during the three years of recession were considerably larger than in any of the cycles since 1970. Typically, shortly after the end of a recession, aggregate growth in Arizona accelerates from about the same as the nation (ranging by economic cycle from below to a little above the U.S. average) to a rate far in excess of the national average, ranking among the highest of the states. Even in 2013 — the third full year of recovery from the recession in Arizona — this acceleration relative to the nation had not yet occurred in any of the aggregate measures valued in dollars, including GDP and earnings, or in employment. Depending on the year (2011, 2012 and 2013) and measure, Arizona's growth rate ranked from a little above to a little below the middle of the states.

Arizona, however, is not alone in its unusually poor rate of growth relative to other states. Among the states most affected by the real estate boom and bust, neighboring Nevada's aggregate annual percent changes have been lower than those of Arizona throughout the recession and recovery. Growth rates in Florida have been only a little higher than those in Arizona.

### **AGGREGATE ECONOMIC GROWTH**

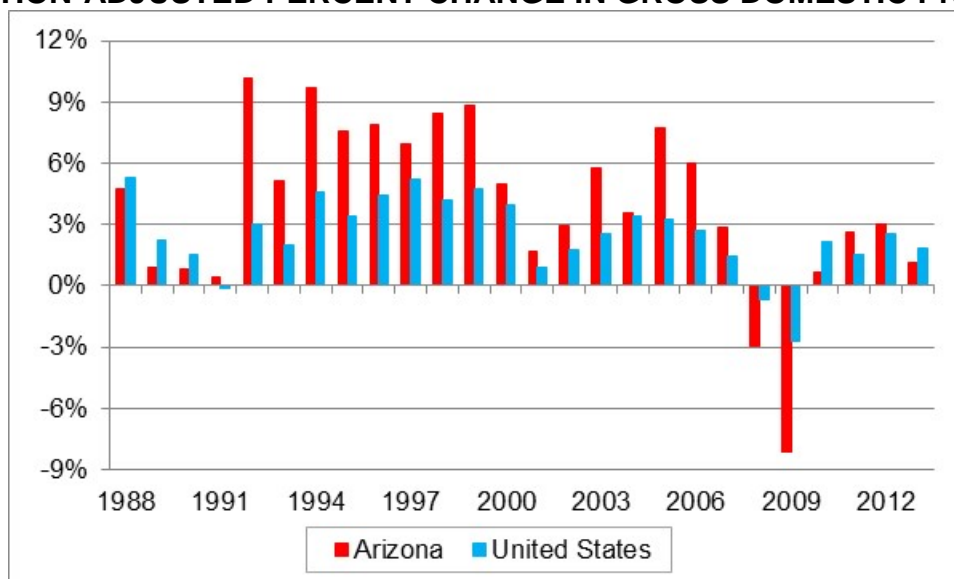
Of the aggregate indicators, those measured in dollars are preferable to employment since the employment figures do not differentiate between full-time and part-time workers, nor do they provide any indication of job quality, as measured by wages and broader measures of compensation. However, most dollar measures of the economy at a state level are only released annually, with 2013 being the latest data.

GDP is the broadest measure of the economy. The inflation-adjusted annual percent changes in GDP in Arizona are compared to the national average in Chart 3. The weakness in Arizona's growth rates since 2007, both relative to the national average and to the historical record, are apparent. Typically, growth rates in Arizona during economic expansions are much higher than the national average. The only other extended period in which growth rates in Arizona were less than or similar to the U.S. average was 1988 through 1991, another period in which growth in Arizona was disproportionately affected by a real estate bust.

Since up-to-date monthly estimates of employment are available (the November 2014 estimates were released in late December), the analysis in the remainder of this section focuses on Arizona's employment, with unemployment also being examined. Arizona is compared to the nation and to other states, primarily since 2007.



**CHART 3**  
**INFLATION-ADJUSTED PERCENT CHANGE IN GROSS DOMESTIC PRODUCT**



Source: U.S. Department of Commerce, Bureau of Economic Analysis.

### **Unemployment and Wage and Salary Employment Data From the BLS**

The U.S. Department of Labor's Bureau of Labor Statistics (BLS) releases monthly estimates of employment and unemployment by state about three weeks after the end of a month. While timely, these estimates have various shortcomings.

The employment estimates come from a survey of employers. Sampling error is large; significant revisions after the end of a calendar year are not uncommon. Moreover, the estimates include only nonagricultural wage and salary employment.

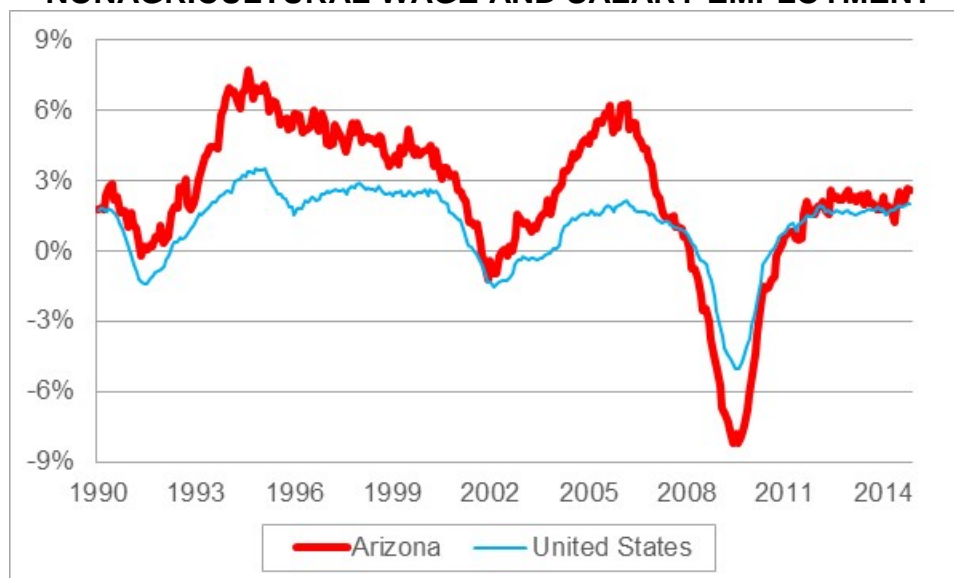
The unemployment estimates are derived largely from a survey of households. Since sampling error is very substantial, the sample results are combined with other data to produce an estimate that still has a wide margin of error. Definitional issues also affect the unemployment estimates. For example, if an unemployed individual becomes discouraged and stops looking for a job, this person is dropped from the count of unemployment, being reassigned to the category of "not in the labor force."

### **The Employment Recession**

The percent change in employment in Arizona typically is similar to the nation during a recession, as in the 1990-91 and 2001 recessions (see Chart 4). In contrast, the state experiences much higher growth rates than the national average during economic expansions.

The timing of the period of employment losses during the last recession differed from the official dating of the recession. In particular, employment losses nationally continued for several months after the officially dated end of the recession.

**CHART 4**  
**YEAR-OVER-YEAR PERCENT CHANGE IN**  
**NONAGRICULTURAL WAGE AND SALARY EMPLOYMENT**



Source: U.S. Department of Labor, Bureau of Labor Statistics (monthly employment).

Nationally, employment peaked in January 2008, then fell for 25 months, through February 2010. Employment dropped 8.7 million during this period. During the prior downturn that began in March 2001, employment losses occurred over a 30-month period, but totaled only 2.6 million. However, in the prior nine employment downturns since World War II, employment declines ranged from less than one year to only a little more than one year in length. The magnitude of the decrease in employment in the most recent recession was 6.3 percent, compared to between 1.3-and-4.4 percent in the prior 10 downturns.

In most states, the timing of the employment declines during the latest recession was similar to the nation. However, the length of the period of employment declines was considerably shorter or longer in some states. Arizona had the fourth-longest downturn in the nation, starting three months earlier and lasting seven months later than the nation. Nevada's employment losses began several months earlier than in Arizona, and ended at the same time. Michigan and Ohio were experiencing employment losses even during the mid-2000s economic expansion; employment losses in these states ended at about the same time as the nation's employment downturn ended.

Compared to the national employment decrease of 6.3 percent, the loss ranged from just 1.1 percent in Alaska to 14.3 percent in Nevada. At 11.6 percent, Arizona had the third-largest loss in the nation, with only Nevada and Michigan faring worse. The decline in Florida was nearly as large as in Arizona.

The states with the largest employment losses fall into one of two categories:

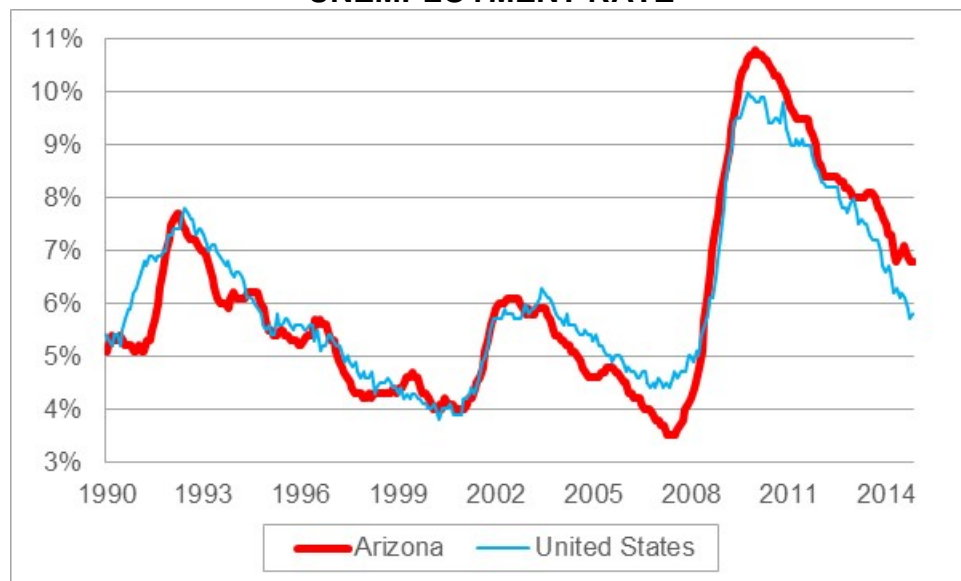
- States along the southeast Atlantic Coast and in the West with traditionally fast growth, some of which were targeted by real estate investors during the real estate boom of the mid-2000s. The subsequent real estate bust had a severe impact on these states. Nevada, Arizona, and Florida were affected the most, but California, Oregon, Idaho, North Carolina, South Carolina, and Georgia had employment declines larger than the nation.
- States with a manufacturing base that were already doing poorly before 2008: Michigan, Ohio, and Rhode Island.

During the mid-2000s, the unemployment rate was as low as 3.5 percent in Arizona and 4.4 percent nationally (see Chart 5). Arizona's low point ranked tied for 17th lowest among the 51 "states" (including the District of Columbia) and in the middle of 12 western states.<sup>4</sup> During 2009 and 2010, the unemployment rate reached 10.0 percent nationally and 10.8 percent in Arizona. The state's figure ranked tied for 39th nationally and ninth in the West. Arizona had the fifth-highest rise in the unemployment rate among the 51 states; in the West, California and Nevada had larger increases.

### The Employment Recovery

Employment began to rise nationally in March 2010. A few states began to recover in 2009, but the upswing did not start until September or October of 2010 in Arizona, Nevada, New Mexico, Maine, and New Jersey.

**CHART 5  
UNEMPLOYMENT RATE**



Source: U.S. Department of Labor, Bureau of Labor Statistics (monthly seasonally adjusted unemployment rate).

<sup>4</sup> The 12 western states used in this analysis are Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Texas, Utah, Washington, and Wyoming.

As of November 2014, the employment expansion nationally had lasted 57 months. During this period, employment rose by 10.4 million. In contrast, the entire expansionary period of the prior cycle lasted only 53 months, with employment gains totaling 8.2 million. However, due to the large losses during the last recession, employment in November 2014 was only 1.7 million more than at the peak of the prior expansion, compared to an employment gain of 5.6 million between the peaks in February 2001 and January 2008.

From the employment trough, the employment increase nationally was 8.0 percent as of November 2014. North Dakota, benefiting from an oil boom, had the largest increase at 31 percent; it began its recovery 10 months before the nation. Otherwise, Utah and Texas had the largest gains at 15 percent, while Maine, Mississippi and New Jersey had the smallest increases at 3 percent. Arizona's gain of 9.5 percent was not much higher than the national average and ranked tied for sixth among 12 western states. However, Arizona's gain was tied for 10th highest in the nation.

Despite the employment growth since the end of the employment recession being a little above the national average, Arizona still compares poorly when comparing the latest employment figures to the level at the start of the recession. Employment in November 2014 was 3.2 percent below the peak, with the differential ranking 49th nationally and 11th of the 12 western states. Alternatively, the numeric increase in employment since the end of the recession can be calculated as a percentage of the numeric losses during the recession. Arizona had recovered 72 percent of its job losses as of November 2014. Only nine states, including Nevada and New Mexico in the West, had a lower figure. Nationally, the figure was 119 percent. In 12 states, including Colorado, Texas, and Utah, the ratio of job gains to job losses exceeded 150.

As of November 2014, Arizona's unemployment rate was 6.8 percent, still higher than the national average of 5.8 percent. Only seven states had a higher unemployment rate. In the West, California, Nevada and Oregon had slightly higher rates. The decline in Arizona from the highest rate reached during the recession was near the national average.

Relative to the prerecessionary low point, Arizona's unemployment rate in November 2014 compares particularly unfavorably. It is 3.3 percentage points higher, the largest differential in the nation. In a few states, the latest unemployment rate was slightly lower than the low point before the recession. Arizona's ranks on the various employment and unemployment measures are shown in Table 1.

### **Total Employment Data From the BEA**

The U.S. Department of Commerce's Bureau of Economic Analysis (BEA) produces annual estimates of both wage and salary employment and total employment by state. However, the figures are not released until nine months after the end of a calendar year. The delay is due to the amount of time that elapses before the quarterly Census of Employment and Wages (CEW) is released. The CEW is a complete count of all workers covered by the unemployment insurance program. The BEA adds estimates of the number of wage and salary workers not covered by unemployment insurance to the CEW figures. To reach total employment, the BEA adds an estimate of the number of proprietors.

**TABLE 1**  
**EMPLOYMENT AND UNEMPLOYMENT,**  
**ARIZONA'S RANK AMONG THE STATES (1 = BEST)**

	<b>Nationally (51 States)</b>	<b>West (12 States)</b>
<b>Employment</b>		
Length of Recession	48	11
Percent Change:		
Peak to Trough	49	11
Trough to November 2014	10 tie	6 tie
Peak to November 2014	46 tie	11
Ratio, Increases During Recovery to Losses During Recession	42	10
<b>Unemployment Rate</b>		
Lowest During Mid-2000s	17 tie	6 tie
Highest During Recession	39 tie	9
November 2014	43 tie	9
Change During Recession	47	10
Change Since Recessionary Trough	19 tie	7 tie
Change Since Mid-2000s Peak	51	12

Source: Calculated from U.S. Department of Labor, Bureau of Labor Statistics.

According to the BEA's time series of total employment by state for the period from 1969 through 2013, the annual growth rate has varied widely by state in most years. However, the range in employment growth rates across the states has been unusually narrow since the end of the employment recession in 2010.

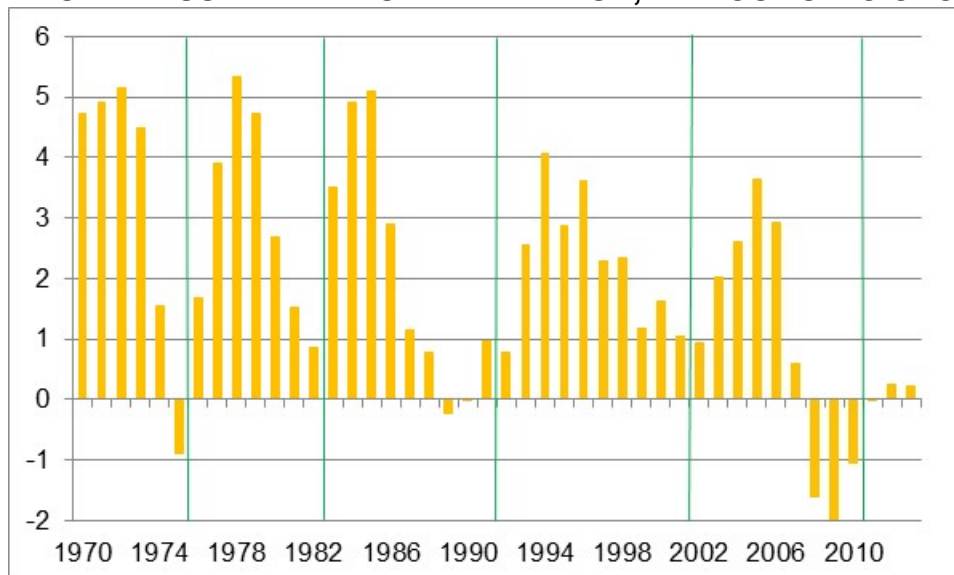
In Arizona, the percent change in employment during recessions typically is about the same as the national average. However, during the last recession, Arizona's rate of job loss was greater than the U.S. average in three consecutive years. In some cycles, the percent increase in employment during the first year of recovery is not much higher in Arizona than the nation, but in the subsequent expansionary years, employment growth in Arizona during the five prior economic cycles always was substantially greater than the national average. In each cycle, the differential exceeded 2 percentage points in at least four consecutive years, reaching 4 percentage points or more in some years (See Chart 6).

During 2011, the first year of recovery from the employment recession, Arizona's employment growth was only equal to the national average, a worse performance than in the initial recovery year of each of the five prior cycles. In 2012 and 2013, Arizona's growth rate was barely higher than the national average (0.3 percentage points higher in 2012 and 0.2 higher in 2013) — a sharp contrast to growth rates of at least 2 percentage points higher in each comparable year of the prior five cycles.

However, Arizona is not alone in experiencing much weaker than normal employment growth in recent years. Most of the other typically fast-growth states in the Southeast and West also are experiencing subpar performances; Texas is the exception.



**CHART 6**  
**PERCENTAGE-POINT DIFFERENCE IN ANNUAL EMPLOYMENT CHANGE,**  
**ARIZONA LESS THE NATIONAL AVERAGE, BY ECONOMIC CYCLE**



Note: Green vertical lines mark the end of a recession.

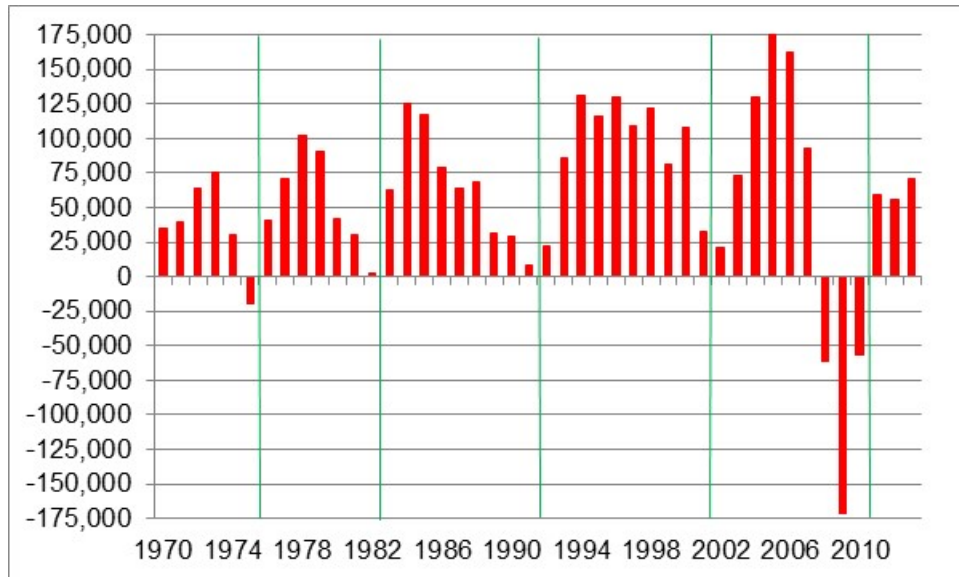
Source: Calculated from U.S. Department of Commerce, Bureau of Economic Analysis.

Since percent changes become smaller as the base becomes larger, interpreting percent changes over a long period is difficult. As an alternative, the annual numeric increases in total employment in Arizona are presented in Chart 7 by economic cycle. Total employment in Arizona has rarely declined, even during recessions, but the annual employment change still is highly cyclical.

Annual gains at the peak have increased in each cycle. This apparent upward trend, however, is misleading. Growth during the 1992-to-2001 and 2001-to-2010 economic cycles was influenced by conditions that are unlikely to recur. Economic growth during the mid-2000s economic expansion was propelled by a real estate boom that was much more heavily felt in Arizona than the nation. During the 1990s expansion, the stock market boom contributed to strong economic growth nationally and in Arizona that lasted longer than in any cycle. In both expansions, the large baby-boom generation was of an age in which productivity generally is highest.

Chart 8 presents the annual average gain in employment and population by economic cycle, with the cycles measured from peak to peak rather than from trough to trough as in Chart 7. The average in each of the last two cycles was considerably higher than in the preceding two cycles. The norm for Arizona likely is closer to the numeric gains in employment and population experienced in the 1981-to-1990 period than in the 1990-to-2007 period. During the 1980s, annual employment gains exceeded 100,000 in two years. In contrast, the largest gain in the current cycle was about 71,000 in 2013.

**CHART 7**  
**ANNUAL NUMERIC CHANGE IN TOTAL EMPLOYMENT IN ARIZONA**  
**BY ECONOMIC CYCLE**



Note: Green vertical lines mark the end of a recession.

**CHART 8**  
**ANNUAL AVERAGE NUMERIC CHANGE IN ARIZONA BY ECONOMIC CYCLE,**  
**MEASURED FROM PEAK TO PEAK**



\* The 2007-to-2013 cycle is incomplete; the averages will be greater once the peak is reached.

Source (Charts 7 and 8): Total employment change calculated from U.S. Department of Commerce, Bureau of Economic Analysis. Population change calculated from U.S. Department of Commerce, Census Bureau (through 2000) and Arizona Department of Administration, Office of Employment and Population Statistics (since 2000).

### Employment by Sector and Subsector

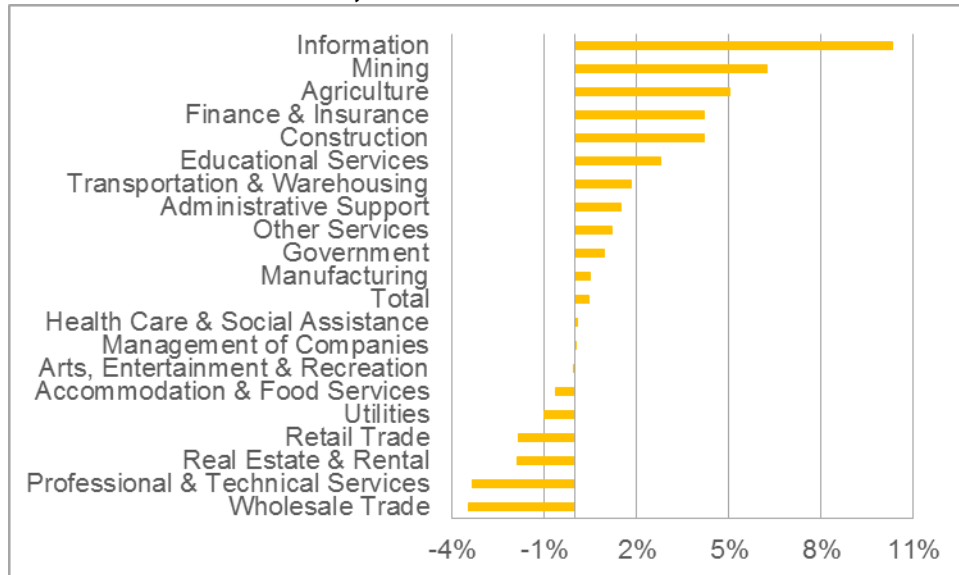
The BEA produces annual estimates of employment by sector (and in some sectors by subsector). The percent changes from 2007 through 2010 (the recession) and from 2010 through 2013 (the recovery) were calculated. To provide the latest information, the percent changes in the sectoral estimates from the BLS from November 2013 through November 2014 also were calculated (these are referred to as 2014 in the following discussion). The BLS data by sector are subject to potentially large revisions.

The focus of analysis in this section is the difference in the percent change in employment in Arizona versus the national average; the differences by sector are shown in Chart 9 for the percent change between 2010 and 2013. The sectors vary widely by size; each of the three sectors with the largest positive differential in Chart 9 are quite small. For the BEA sectors, and some subsectors, Arizona's performance also is compared to 12 other states in the West and Southeast.<sup>5</sup>

Basic economic activities — those that sell their products to customers outside the state — drive the economy. While Arizona has numerous basic activities, the most significant can be grouped into three categories: high-technology manufacturing, tourism, and “back-office” administrative functions. The latter category includes financial activities, insurance carriers, call centers, etc.

Since most sectors, and even subsectors, consist of a mix of basic and nonbasic activities, it is difficult to identify the basic activities from the level of detail available from the BEA and BLS

**CHART 9**  
**PERCENTAGE-POINT DIFFERENCE IN EMPLOYMENT CHANGE BY SECTOR**  
**BETWEEN 2010 AND 2013, ARIZONA LESS THE NATIONAL AVERAGE**



Source: Calculated from U.S. Department of Commerce, Bureau of Economic Analysis.

<sup>5</sup> The group of 13 states is Arizona, California, Colorado, Florida, Georgia, Idaho, Nevada, New Mexico, North Carolina, Oregon, Texas, Utah, and Washington.

data.<sup>6</sup> However, data for Arizona's two primary high-technology manufacturing industries — electronics and transportation equipment (primarily aerospace in Arizona) — are available. Each accounts for approximately 1 percent of the state's employment.

Transportation equipment in Arizona did well during the recession versus the rest of the nation and ranked third among the 13 comparison states, but has since experienced substantial relative declines in employment. It ranked tied for eighth on the 2010-to-2013 percent change. A significant portion of Arizona's aerospace activity is tied to federal government purchases, particularly related to the defense and space programs. Defense spending in Arizona dropped in 2010, recovered in 2011, and dropped again in 2013. The inflation-adjusted decline from 2009 through 2013 was 15 percent.

The sectoral share of electronics manufacturing in Arizona declined significantly through 2006, but hardly dropped from 2007 through 2012. Arizona ranked fifth in the comparison group during the recession and ninth during the recovery. However, the percent decrease in electronics employment in Arizona in 2013 and 2014 was larger than the nation.

The next-largest manufacturing subsector in Arizona is fabricated metal products. After recovering between 2010 and 2013 from relative losses experienced during the recession, employment dropped versus the national average in 2014. Thus, the three largest manufacturing subsectors all underperformed the nation in 2014; each experienced a loss in employment. In contrast, the balance of the manufacturing sector has fared better than the nation since 2010.

Manufacturing as a whole, which accounts for 5 percent of the state's employment, performed similarly to the nation between 2007 and 2013. During the recession, Arizona ranked sixth among the 13 comparison states; its rank was ninth between 2010 and 2013. The slight increase in employment during 2014 was less than the national average.

Tourism activities are spread through several sectors. Sales to tourists generally cannot be separated from sales made to Arizonans. The primary exception is the accommodation portion of the accommodation and food services sector, which accounts for a little more than 1 percent of the state's employment. Accommodation in Arizona was hit harder during the recession and continued to underperform the nation from 2010 through 2013. Among the 13 comparison states, Arizona ranked last from 2007 through 2010 and tied for 11th from 2010 through 2013. Losses in Nevada were similar to those in Arizona. However, employment growth was registered in 2014 in Arizona, compared to no change nationally. The food services subsector, accounting for 6 percent of the state's employment, did not do as poorly relative to the nation from 2007 through 2013 and posted greater growth in 2014.

The arts, entertainment and recreation sector, which accounts for only 2 percent of the state's employment, also is impacted by tourists. It slumped more than the nation during the recession and only matched the national average from 2010 through 2013, but had a growth rate in 2014

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<sup>6</sup> County Business Patterns, produced by the U.S. Census Bureau, provides full industrial detail, but the latest data available from this source are for 2012. In addition, many of the sectorally detailed employment figures must be imputed due to federal disclosure laws.

considerably higher than the nation. Among the 13 comparison states, it ranked 12th during the recession and tied for eighth from 2010 to 2013.

The finance and insurance sector, responsible for 6 percent of the state's employment, has been the bright spot among Arizona's basic activities, outperforming the nation since the end of the recession, with each of its subsectors growing faster than the national average. Though the sector ranked ninth in the comparison group during the recession, it was second from 2010 to 2013.

The administrative support sector — 8 percent of the state's employment — also has outperformed the nation since the end of the recession, with the differential widening in 2014. It was hit hard during the recession, when it ranked 12th in the comparison group. Its rank improved to sixth between 2010 and 2013.

The professional, scientific and technical services sector, with 6 percent of the state's employment, has fared more poorly than the nation since 2007. It ranked 12th in the comparison group during the recession, 11th between 2010 and 2013, and continued to grow more slowly than the nation in 2014. In contrast, the information sector — less than 2 percent of the state's employment — did better than the nation from 2010 through 2013, though, like the nation, it posted almost no employment gain in 2014. The information sector ranked sixth during the recession and first during the recovery in the comparison group. The small (1 percent of the state's employment) management of companies sector performed similarly to the nation from 2007 through 2013, ranking eighth in the comparison group during the recession and seventh between 2010 and 2013. However, it had employment losses in 2014 compared to gains nationally.

Though considerably smaller in size in Arizona than the groupings of basic activities described above, agriculture (a little more than 1 percent of the state's employment) and mining (a sectoral share of less than 1 percent) also are basic. Both were hit hard during the recession but grew faster than the nation between 2010 and 2013. However, mining did not grow as much in 2014 as the nation. During the recession, agriculture ranked last among the comparison states but mining ranked seventh despite an employment gain much lower than the national average. Between 2010 and 2013, agriculture ranked second and mining tied for fourth.

Some sectors are a mix of basic and nonbasic activities. Wholesale trade, which accounts for 3.5 percent of the state's employment, has done more poorly in Arizona than the national average since 2007. It ranked 11th among the comparison states during the recession and 10th during the recovery. It continued to lose jobs in 2014, compared to a gain nationally. The transportation and warehousing sector — 3 percent of the state's employment — has performed similarly to the nation, ranking ninth in the comparison group during the recession and tied for fourth during the recovery; the 2014 percent increase matched the U.S. average. However, the air transportation subsector has done much more poorly than the nation since 2007. The utilities sector, less than 0.5 percent of the state's employment, also has been outperformed by the nation since 2007, ranking 12th during the recession and ninth during the recovery. Employment declined in 2014, compared to a gain nationally.



The remaining sectors are largely nonbasic. Wide dispersion is seen in the growth rates of these sectors.

The construction sector, which accounts for 5 percent of the state's employment, lost jobs during the recession at a far worse pace than the nation, with its losses exceeded only by Nevada among the comparison states. Though its employment rose more between 2010 and 2013 than the national average and ranked second in the comparison group, employment losses returned in 2014 in Arizona compared to a continuing recovery nationally. The real estate and rental sector (6.5 percent of the state's total employment) has done more poorly than the nation since 2007, but the differentials have been relatively small. It was in the middle of the comparison group during the recession and the recovery.

In contrast to the poor performance of construction and real estate, the health care and social assistance sector (nearly 11 percent of the state's employment) and the educational services sector (which consists only of private-sector employers and accounts for 2 percent of the state's jobs) have grown faster than the national average since 2007. Each did particularly well during the recession, when education ranked first, and health care second, among the comparison states. Health care employment rose only a little faster than the nation between 2010 and 2013, but the differential was large in 2014.

Significant state government employment losses during the recession were mitigated by gains in federal employment, both civilian and military; the entire sector ranked 10th in the comparison group. Between 2010 and 2013, government employment, which accounts for 13 percent of the state's employment, did not decline as much in Arizona as nationally, ranking seventh in the comparison group. Small gains, a little greater than the U.S. average, were registered in 2014.

Retail trade, which accounts for more than 10 percent of the state's employment, has been outperformed by the nation since 2007. Arizona ranked 13th in the comparison group during the recession and 12th between 2010 and 2013. All of the sector's components declined more than the nation during the recession but some posted stronger gains during the recovery. The other services sector, 5 percent of the state's employment, did worse than the nation during the recession but better since then. It ranked 11th in the comparison group during the recession and seventh between 2010 and 2013.

## **LOOKING AHEAD**

### **Arizona's Economic Base**

In order for economic growth in Arizona to become more rapid and considerably stronger than the national average, as in prior economic cycles, growth rates need to increase in most of the key basic activities. So far in this recovery, only finance and insurance is outperforming the nation by a significant margin. Tourism is showing signs of improvement, which should continue as the personal finances of residents of other states continue to improve. In contrast, growth rates in basic activities in the administrative support sector and in the professional, scientific and technical service sector will need to improve and high-technology manufacturing job losses will need to reverse.

Outside of tourism, there is little indication that gains in basic activities will accelerate. However, it is difficult to foresee such turnarounds. In the late 1980s and early 1990s, Arizona experienced six consecutive years of growth not much better than the national average. A real estate crash and reduced federal defense spending were largely responsible for the sluggish growth. In the sixth year of the slump, there was little sign that conditions in the basic activities would improve. Yet, in the following year, Arizona's economy began its longest period of substantial economic growth.

Since the late 1980s slump, Arizona's economic base has diversified, with the addition of many "back-office" administrative activities. However, high-tech manufacturing remains tied to two activities that are not expanding. Arizona is losing the distinction of being a high-tech center. The state's overall outlook would be much brighter if other innovative activities became a larger part of the state's economy. The continuing slumps in high-technology manufacturing and in the professional, scientific and technical services sector are significant concerns.

### **Arizona From a National Perspective**

During the last recession, some observers locally and nationally raised the possibility that more than a cyclical correction was occurring, that certain (generally unspecified) underlying conditions were changing permanently. This thought has not often been expressed recently in regards to the national economy, which has now gained more jobs in the current economic expansion than it did in the prior expansion. In contrast, given the sluggish growth in Arizona through 2014, some Arizonans are still questioning whether the Arizona economy will ever return to rates of growth similar to those experienced before the last recession.

The data examined for this paper suggest that recent conditions in Arizona are not unique. Like Arizona, each of the other traditionally fast-growth states (except Texas) also has experienced historically slow growth. With the exception of North Dakota due to its oil boom, no state has experienced economic growth much faster than the nation since the end of the recession.

The sustained below-average growth in most of the Sunbelt states likely is in large part still due to the crash in real estate. In the prior real estate bust in the late 1980s, which was of much lesser magnitude than the latest crash, the Arizona economy slumped for six years. Like Arizona, the hardest-hit states of Florida and Nevada also have recovered slowly from the last real estate bust.

While it seems likely that the Sunbelt states eventually will recover from the real estate bust and return to leading the nation in growth, there is a chance that southeastern and western states will not return to growth rates as far above the national average as in the past. In most of these states, growth is concentrated in relatively few but large metro areas. There is a life cycle to growth in metropolitan areas. Historically, no metro area has experienced fast growth for more than several successive decades. Many of the larger metro areas in the Sunbelt have now experienced several straight decades of fast growth and are among the nation's largest metro areas. While increasing size results in positive agglomeration effects for the local economy, it creates negative effects on the quality of life. Long commute times and poor air quality are among the factors that cause a large metro area's growth rate to slow.

Changing migration preferences also could cause growth rates to slow in parts of the Sunbelt. There has been considerable discussion nationally that young adults (the “millennial” generation) are not as interested in moving to warm climates as preceding generations. In particular, highly educated members of the millennial generation seem to be most interested in locating in high-tech centers with good jobs and a cosmopolitan life style. Arizona and some other parts of the Sunbelt are not good fits for such individuals. However, due to data limitations, it is not possible to assess the extent to which migration patterns of young adults are changing.

In addition to the migration of young members of the workforce, retirement-age migration also has spurred growth in parts of the Sunbelt. However, it appears that the baby-boom generation also is not as interested in moving to warm climates as preceding generations of retirees. The very large number of baby boomers retiring over the next 15 years or so could contribute significantly to Arizona’s growth, but it is not clear that the state is positioned to take advantage of this opportunity. While retirement migration almost certainly will continue to Arizona, its importance as a driving force likely will continue to shrink.

### **Outlook for Arizona**

In addition to local conditions dictating when significantly faster growth will return to Arizona, the national economic cycle also is a significant consideration. On one hand, the national economic expansion is already five years in length, and employment gains in this expansion already are greater than those in the last expansion, suggesting that the remaining length of the expansion is limited. On the other hand, employment still is not much higher than at the prior peak at the beginning of 2008 and other indicators, such as interest rates and inflation, suggest that the expansion is still young. If the national economy continues to grow for several years, then Arizona and other traditionally fast-growth states likely will experience a period of growth well above the national average during the current expansion. If, however, the next national economic downturn is not many years off, then it may not be until the following economic expansion that the fast-growth states return to their traditional relationship.

In the most likely scenario, aggregate economic growth in Arizona will accelerate over the next few years, with a sharp acceleration a possibility. If not before, then after the next national economic downturn, annual numeric employment and population increases should return to the levels of the 1981-90 cycle or somewhat higher. The alternative scenario is that gains in Arizona and other Sunbelt states will not reach historical levels, though these states likely will continue to grow somewhat faster than the national average.

# THE PRODUCTIVITY AND PROSPERITY PROJECT

The Productivity and Prosperity Project: An Analysis of Economic Competitiveness (P3) is an ongoing initiative begun in 2005, sponsored by Arizona State University President Michael M. Crow. P3 analyses incorporate literature reviews, existing empirical evidence, and economic and econometric analyses.

Enhancing productivity is the primary means of attaining economic prosperity. Productive individuals and businesses are the most competitive and prosperous. Competitive regions attract and retain these productive workers and businesses, resulting in strong economic growth and high standards of living. An overarching objective of P3's work is to examine competitiveness from the perspective of an individual, a business, a region, and a country.

## THE CENTER FOR COMPETITIVENESS AND PROSPERITY RESEARCH

The Center for Competitiveness and Prosperity Research is a research unit of the L. William Seidman Research Institute in the W. P. Carey School of Business, specializing in applied economic and demographic research with a geographic emphasis on Arizona and the metropolitan Phoenix area. The Center conducts research projects under sponsorship of private businesses, nonprofit organizations, government entities and other ASU units. In particular, the Center administers both the Productivity and Prosperity Project, and the Office of the University Economist.

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