AN ECONOMIC COMPARISON OF ARIZONA AND UTAH

September 2015

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P3 | PRODUCTIVITY AND PROSPERITY PROJECT

ASU W. P. CAREY SCHOOL of BUSINESS
ARIZONA STATE UNIVERSITY

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SUMMARY

The business climate in Utah has been evaluated as being among the best in the nation, while Arizona ranks among the middle of the states. Two factors that are of key importance to 21st-century economic development — the quality and availability of the labor force and the quality and availability of the physical infrastructure — are rated more highly in Utah than in Arizona. On business costs and other location factors, Utah also has an edge over Arizona.

Measures of aggregate economic growth, such as gross domestic product and employment, often receive the greatest attention, but the ultimate goal of economic development is to enhance the prosperity of an area, not to increase the area's economic size. In order to achieve gains in prosperity, increases in productivity must be realized. By state, there is no true measure of productivity; per worker measures are used as proxies. Arizona compares more favorably than Utah on such measures.

Utah compares more favorably on measures of prosperity than of productivity. Relative to Arizona, median household income is higher in Utah, the poverty rate is lower in Utah, and unemployment rates are lower in Utah. Utah does not compare as favorably on prosperity indicators measured on a per person basis because children account for such a high proportion of the population. Still, per capita personal income is about as high in Utah as in Arizona and per capita gross domestic product is higher in Utah than in Arizona.

On most of the measures of prosperity and productivity, Utah has been posting stronger gains than Arizona. On some measures, Utah has performed better since 1987.

Economic Development

The quality and availability of the labor force typically is evaluated through measures of educational achievement and attainment. Achievement can be measured using test scores. Students in Utah score higher than those in Arizona on such subjects as reading, mathematics, and science. Educational attainment, typically measured as the share of adults with at least a high school diploma or as the share who have earned at least a bachelor's degree, also is higher in Utah than in Arizona.

Educational achievement and attainment is affected by a number of conditions, including income, whether English is a child's first language, and the educational attainment of a child's parents. Since these factors are correlated to race/ethnicity, significant variations in test scores and educational attainment exist across racial/ethnic groups. Large differences are present between Arizona and Utah in such characteristics as income, poverty, share of immigrants, and educational attainment of parents, with Utah comparing more favorably on each characteristic with regard to educational performance. The racial/ethnic mix also is considerably different in the two states, with 80 percent of Utah's residents being non-Hispanic white, compared to 57 percent in Arizona.

Utah performs better than Arizona on educational measures largely due to its demographics. In terms of economic development, however, the lower overall achievement and attainment in Arizona are significant negative factors, while Utah rates positively.

Since most children attend public schools, public policy plays a significant role in a state's educational performance. Funding is a primary input into the educational system. Funding per pupil in elementary and secondary schools is very low in both Arizona and Utah, with each state ranking among the bottom three states. With the needs being greater in Arizona, due to such factors as poverty and lesser educational attainment among parents, educational achievement is lower in Arizona despite similar funding. Higher education funding per student historically was higher in Arizona than Utah, but in recent years, Arizona's figure has fallen below that of Utah.

Depending on the type of physical infrastructure, the quality and availability may be either a public-sector responsibility or a private-sector concern. The public sector has the primary responsibility for roads, highways and transit and for water and wastewater services. The private sector is largely responsible for energy production and telecommunications.

Utah's physical infrastructure is rated more highly than Arizona's infrastructure in most categories, with a large differential in surface transportation. In recent years, state and local governments in Utah have been spending relatively more on capital outlays than their counterparts in Arizona.

Business costs are another of the economic development factors, but public policy has little effect on most costs — including the cost of labor, real estate prices, and energy costs. Taxes are the primary exception. State and local government taxes are not a significant expense for most businesses and therefore play a limited role in economic development. Moreover, taxes are evaluated by both businesses and individuals relative to the quality and availability of valued public services.

The overall tax burden — including taxes paid by individuals and businesses — is similar in Arizona and Utah. The tax burden on individuals is lower in Arizona, but the tax burden on businesses is lower in Utah. Moreover, business taxes in Arizona are higher than average relative to the services businesses receive while business taxes in Utah are lower than average relative to the services businesses receive. Since business taxes are much more important than individual taxes to economic development, Utah once again compares more favorably than Arizona.

In the 21st-century economy, technology and innovation are taking on increasingly important roles in economic development. Both human and financial capital are especially important to high-technology and innovative activities. On each of the human capital measures examined, Utah compares more favorably than Arizona. On the measures of financial capital, the two states are similar on some measures, but Utah compares more favorably on others, including venture capital.

Economic Profile

A greater proportion of Utah residents of working age are employed than Arizona residents. The differential is large among men. Among women, the employment-to-population ratio also is higher in Utah, though the ratio is higher in Arizona among those of prime child-rearing age (25-to-44 years old).

The sectoral composition of the economy is somewhat different in Arizona and Utah. The manufacturing sector is relatively larger in Utah, as are some of the professional services sectors, including information; finance and insurance; and professional, scientific and technical services. In contrast, the sectoral share is larger in Arizona in other services, including real estate and rental; administrative and waste management services; health care and social assistance; and accommodation and food services. Arizona's industrial mix is tilted to lower-wage sectors and subsectors. As a result, its industrial job quality is less than the national average. In contrast, Utah's industrial job quality is better than the national average.

Differences between the states also are present in occupational shares of the total economy. Utah has higher shares of its workers engaged in production occupations and construction and extraction occupations. Shares are higher in Arizona in food preparation and serving, protective service, and personal care occupations. The difference between the states in job quality as measured by occupational data is not as great as by industrial data. Arizona's occupational job quality is marginally better than the national average, with Utah's rating a little higher.

Based on occupational data, high-technology activities account for a slightly greater share of total employment in Arizona than in Utah. Based on industrial data, the high-tech share in Utah is greater than in Arizona. As defined by industry, there is no trend in the high-tech share in Utah, while the share is trending down in Arizona.

Economic Performance

On the proxy measures of productivity, the gap between Arizona and Utah has been narrowing, but gross domestic product per employee in 2013 was 5 percent higher in Arizona than in Utah and the differential in earnings per worker was 6 percent. Utah also has been gaining on Arizona on prosperity measures. In 2014, per capita gross domestic product was 12 percent higher in Utah and per capita personal income was nearly the same in the two states. The unemployment rate was 3.8 percent in Utah and 6.9 percent in Arizona. Over the 2009-through-2013 period, median household income was 15 percent higher in Utah and the poverty rate in Utah was 12.7 percent in Utah and 17.9 percent in Arizona.

Aggregate economic growth — for example, the percent change in employment or gross domestic product — is not correlated to gains in prosperity and productivity. Historically, aggregate economic growth rates in Arizona typically were higher than those in Utah except during some recessionary periods. Since 2007, however, aggregate growth rates have been higher in Utah than in Arizona.

GENERAL COMPARISON

Arizona and Utah share a border and are similar in some respects, but in other ways are significantly different.

Arizona's land area is 1.3 times as large as Utah, but its population of 6.7 million in 2014 was 2.3 times higher than Utah's 2.9 million. In both states, a high share of the residents — 95 percent in Arizona and 89 percent in Utah — lived in metropolitan areas, based on population estimates made by the U.S. Department of Commerce, Census Bureau.

The 4.5 million residents of the Phoenix-Mesa-Scottsdale metropolitan area accounted for two-thirds of the Arizona total. Another 1.0 million people (15 percent of the state total) lived in the adjacent Tucson metro area. The combined population of five other metro areas — Flagstaff, Lake Havasu City-Kingman, Prescott, Sierra Vista-Douglas, and Yuma — accounted for 13 percent of the state's total (see Table 1). The Phoenix area is even more dominant based on gross domestic product (GDP), accounting for more than three-fourths of the state's total.

Salt Lake City, the largest metro area in Utah, is not as dominant, accounting for 39 percent of the state's residents and 56 percent of its GDP. However, its three largest metro areas, including Ogden-Clearfield and Provo-Orem, accounted for nearly as large a share of the state's population

TABLE 1
METROPOLITAN AREAS

	2013 GDP*	2014 Population	Share of State GDP	Share of State Population
Arizona	$274,734	6,731,484		
Flagstaff	5,214	137,682	1.90%	2.05%
Lake Havasu City-Kingman	3,751	203,361	1.37	3.02
Phoenix-Mesa-Scottsdale	209,523	4,489,109	76.26	66.69
Prescott	4,792	218,844	1.74	3.25
Sierra Vista-Douglas	4,221	127,448	1.54	1.89
Tucson	35,412	1,004,516	12.89	14.95
Yuma	5,625	203,247	2.05	3.02
Balance of State	6,196	347,277	2.26	5.16
Utah	134,974	2,942,902		
Logan	4,388**	118,343	3.25	4.02
Ogden-Clearfield	24,101	632,293	17.86	21.49
Provo-Orem	19,102	571,460	14.15	19.42
St. George	4,215	151,948	3.12	5.16
Salt Lake City	76,185	1,153,340	56.44	39.19
Balance of State	6,983	315,518	5.17	10.72

* Gross domestic product in millions of dollars.
** Part of the Logan metro area is in Idaho; thus, the Logan GDP in Utah is overstated and the balance of state GDP is understated.

Source: U.S. Department of Commerce, Census Bureau (population) and U.S. Department of Commerce, Bureau of Economic Analysis (GDP), http://www.bea.gov/regional/index.htm.

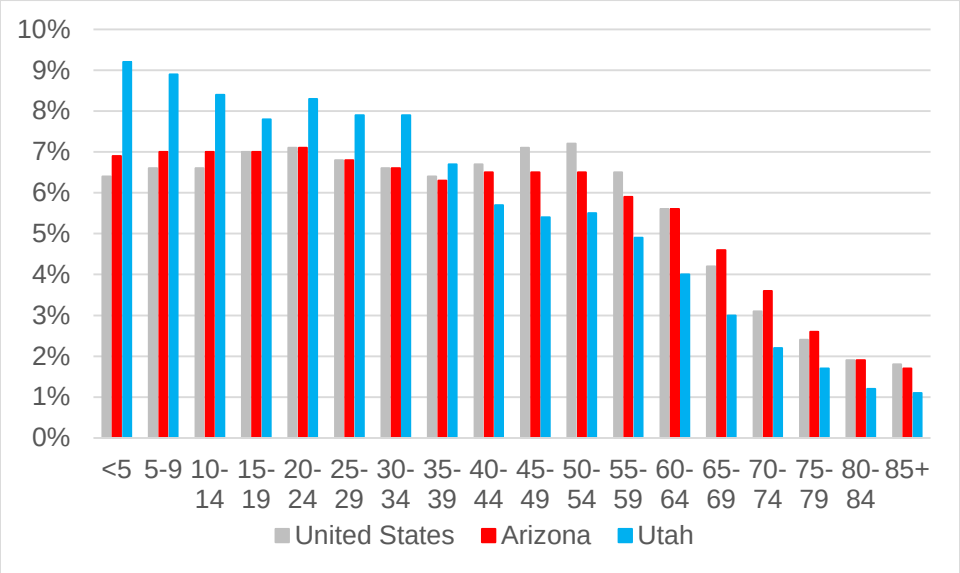
and gross product as the two largest metros in Arizona. Two other metro areas — Logan and St. George — combined to account for 9 percent of Utah's population.

Demographic Characteristics

Utah has a younger population than Arizona; its median age of 29.6 years was the lowest in the nation while Arizona's median of 36.3 also was lower than the national average of 37.3.[1] The age distribution is displayed in Chart 1. Arizona's age distribution was not much different from the nation, but Arizona had somewhat higher-than-average shares in the 0-to-14 and 65-to-79 age groups and somewhat below-average shares in the 35-to-59 age group. In contrast, the age distribution in Utah was much different, with considerably above-average shares in the 0-to-34 age group and below-average shares among those 40 and older.

Utah's child-dependency ratio — the number of residents younger than 18 divided by the number from 18-through-64 years of age — of 52.6 was much higher than the national figure of 37.7, but its old-age dependency ratio (the number of residents 65 and older divided by the number from 18-through-64 years of age) of 15.6 was below the national figure of 21.4. Arizona was a little above average on each dependency ratio, with a child ratio of 41.3 and an old-age ratio of 23.7.

CHART 1
AGE DISTRIBUTION, 2009-13 AVERAGE



Source: U.S. Department of Commerce, Census Bureau, American Community Survey, Table S0101, http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml.

[1] These figures, as well as those for the age distribution, are for the average of the five years from 2009 through 2013. The source is the American Community Survey conducted by the U.S. Department of Commerce, Census Bureau. Five-year averages are used to reduce sampling error.

Given its high share of children, Utah's average household size of 3.10 (according to the 2010 census) was considerably higher than the averages of 2.58 nationally and 2.63 in Arizona. The large share of children in Utah is a function of the large share of adults of prime child-bearing age and an above-average fertility rate. In 2013 according to the National Center for Health Statistics, the total fertility rate — an estimate of the number of births that a hypothetical group of 1,000 women would have over their lifetimes, based on age-specific birth rates in a given year — was 2.34 in Utah, compared to 1.86 nationally and 1.97 in Arizona.

Over the 2009-to-2013 period, 80.1 percent of Utah's residents were non-Hispanic whites, higher than the national share of 63.3 percent. Arizona figure was only 57.3 percent. The percentage of residents who are foreign born also was lower in Utah at 8.2 versus the national figure of 12.9. Arizona's share was 13.4 percent.

Population Growth

At the end of World War II, the population of Arizona and Utah was nearly the same, each accounting for 0.45 percent of the national total. Since then, the population has grown more rapidly in both states than the national average, but the increase has been much greater in Arizona; it accounted for 2.11 percent of the national total in 2014, compared to 0.92 percent in Utah. On a percentage basis, Arizona's population rose faster than the Utah population every year from 1983 through 2006, but Utah's gain was greater in each year from 2007 through 2013. Arizona's population growth in recent years was disproportionately affected by the recession that began in late 2007 and by the weak economic recovery that followed.

Net natural increase (more births than deaths) has accounted for most of Utah's population growth historically. In contrast, net migration (from other states and from other countries) has accounted for the majority of Arizona's population increase. According to estimates of net migration by decade from the University of Wisconsin,[2] 65 percent of Arizona's population change between 1950 and 2010 was due to net migration. This share held relatively steady by decade. In contrast, net migration accounted for only 22 percent of Utah's population change from 1950 to 2010. This share has been volatile, with Utah experiencing net out-migration in three of the six decades but with net migration accounting for between 29-and-38 percent of the population change during the 1970s, 1990s, and 2000s.

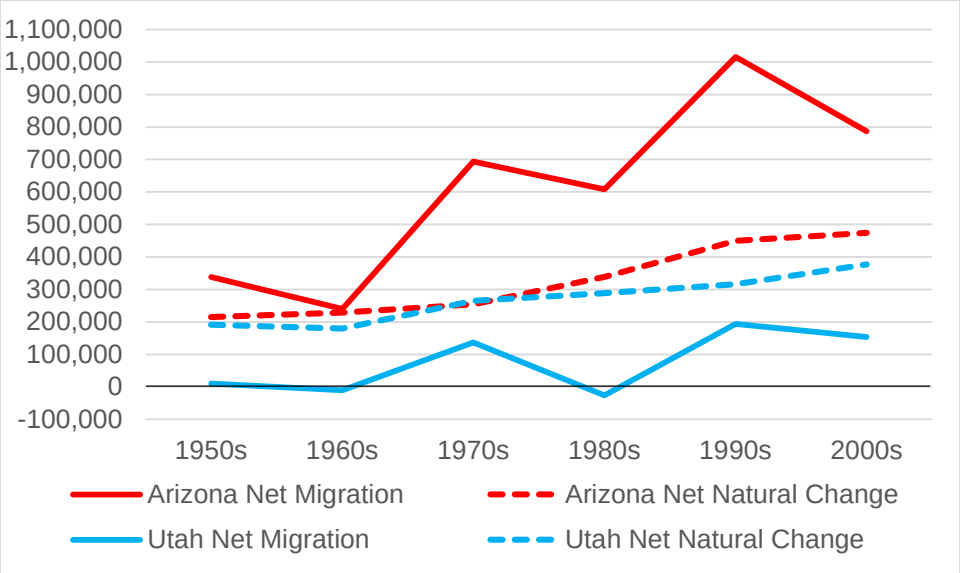
Net natural change and net migration by decade are shown in Chart 2 for Arizona and Utah. Despite Arizona's much larger number of residents, net natural change in Utah has been nearly as great as in Arizona.

Net migration to Arizona was much stronger than to Utah among those in the 60-to-74 age group and also stronger in the 25-to-39 age group over the 1950-to-2010 period. Relative to Arizona, Utah's net migration has been strongest among very young adults and young children.

[2] The estimates of net migration by decade were made by collecting data on births and deaths and subtracting the net natural change from the population change between decennial censuses. Net migration includes net domestic migration and net international migration. The estimates are available at http://www.netmigration.wisc.edu/.

According to estimates from the U.S. Census Bureau, net migration was a lesser share of the population change in each state between 2010 and 2014, accounting for 14 percent of the population gain in Utah and 51 percent in Arizona. Domestic net migration accounted for 34 percent in Arizona, compared to just 2 percent in Utah.

CHART 2
NET MIGRATION AND NET NATURAL CHANGE BY DECADE



Source: University of Wisconsin, Applied Population Laboratory, http://www.netmigration.wisc.edu/.

ECONOMIC DEVELOPMENT

Regional economies, such as state economies, are driven by economic activities that bring money into the region that would otherwise not be present, by selling goods and services to customers — individuals, companies, and governments — who are not residents of, or operate in, the region. Such activities have been variously labeled as "tradable," "export," "basic," and "traded sector" — the latter term is used in this paper. Traded-sector activities are responsible for the prosperity and growth of each regional economy, but typically represent only about 30 percent of a region's total economic activity.

Traded-sector activities fundamentally differ from "population-serving" activities, which sell to and support residents and businesses located within the region. While necessary to the functioning of a regional economy, population-serving activities respond to the growth occurring in traded-sector activities; they do not bring money into the regional economy. Their presence in the region is in response to the spending of businesses that sell goods and services to customers outside the region and to the spending of the employees of the traded-sector businesses. Population-serving activities would not exist if traded-sector activities were not present. Regional economic development focuses on traded-sector activities since other regions in the United States and other nations compete to become the home of these activities.

The importance of various economic development factors — also known as "location factors" or more generally as the "business climate" — is discussed in 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. With the evolution of the American economy from the industrial age to the information age, the relative importance of the various business location factors also has evolved. In the past, cost factors, including the tax burden, were more significant than they are now. While costs — particularly labor costs — remain on the list of important location factors, two other factors are now rated as more significant to traded-sector companies:

- The quality and availability of the labor force. Educational attainment and achievement are key aspects of labor force quality. Job training programs also contribute.
- The quality and availability of the physical infrastructure, including the transportation system, utilities, and telecommunications.

The relative importance of location factors varies by the type of economic activity. For companies with a focus on technology and innovation, labor force issues are of particular significance, with cost factors relatively less important.

While public policy has little, if any, effect on some of the location factors, such as labor costs and real estate costs, the availability and quality of the educational system and some parts of the physical infrastructure are heavily dependent upon the public sector. In particular, funding of the public educational system and of the transportation infrastructure play key roles in economic development.

Following a summary of studies evaluating the business climate, the major economic development factors of education and the physical infrastructure are examined. Other factors, including measures related to technology and innovation, are then addressed.

Evaluations of Business Climate

Various studies address competitiveness or the "best place to do business" at the level of U.S. states. The ratings of competitiveness by state vary considerably across the studies. Because of this variation, it is important to evaluate the strengths and weaknesses of each study to determine which ratings are most reliable. Each of the studies of competitiveness by state appears to have significant limitations. The studies by the Beacon Hill Institute and *Forbes* magazine appear to be the best. The results from these studies are significantly correlated to prosperity, as measured by per capita gross domestic product and per capita personal income.

The latest versions of these two studies are reasonably consistent in their evaluation of competitiveness in Arizona and Utah. Arizona ranks 23rd nationally and fifth among 10 western states in the Beacon Hill Institute study and 22nd nationally and sixth in the comparison group on the *Forbes* study. Utah is evaluated more highly, ranking eighth (second in the comparison group) by Beacon Hill and first by *Forbes*.

Education

Elementary and secondary education and higher education are important aspects of the quality and availability of the labor force. Funding — a key input into the educational system — is examined first, followed by output measures such as educational achievement and attainment.

Funding

In order to compare public finance data across geographic areas, the data generally are expressed on either a per capita basis (divided by the population of the state) or per $1,000 of personal income. Personal income provides an indication of the ability of taxpayers to pay taxes. In states in which per capita personal income is much different from the national average, the adjustments for population size and for personal income will produce significantly different results.

If the per capita measure is used, the public finance figures also should be adjusted for the cost of living. The U.S. Department of Commerce's Bureau of Economic Analysis (BEA) publishes annual estimates of living costs by state and metropolitan area, which it calls "regional price parities" (RPPs). These estimates are limited to calendar years 2008 through 2013 and are available at http://www.bea.gov/regional/index.htm. When examined over time, per capita public finance figures also need to be adjusted for inflation. The gross domestic product implicit price deflator (GDP deflator), available at http://www.bea.gov/national/index.htm#gdp, is one measure of inflation.

If caseload data (the number of people served) are available for a particular public program, the caseload is used instead of the population of the state to calculate the per capita measure. For education, enrollment is the caseload measure and is available for public elementary and secondary schools and for public institutions of higher education. When using caseload data, personal income also can be considered by adjusting the public finance data by both the caseload and by per capita personal income.

Public finance and caseload data are expressed on a fiscal year (FY) basis. For example, fiscal year 2016 is the period from July 1, 2015 through June 30, 2016. Since personal income and the

GDP deflator are produced quarterly, fiscal year averages can be calculated. Estimates of fiscal year RPPs and population are made by averaging two calendar year figures.

In FY 2013 (the latest data available for the RPPs), the cost of living was similar in Arizona and Utah, with living costs 0.3 percent higher in Arizona. Per capita personal income (PCPI) also was similar in the two states at 1.4 percent higher in Arizona than Utah (1.1 percent higher after adjusting for the cost of living). Thus, adjusting per student education revenues or expenditures for these factors has little impact on the comparison of the two states. These adjustments, particularly PCPI, make a difference when comparing Arizona and Utah to the national average and when ranking the states. Compared to the national average, the cost of living in FY 2013 was 2.6 percent lower in Arizona and 2.8 percent lower in Utah. Relative to the U.S. average, PCPI in Arizona was 17.3 percent lower (15.1 percent after adjusting for the cost of living); it was 18.4 percent lower in Utah (16.0 percent after adjusting for the cost of living).

Higher Education. Funding for higher education was discussed in detail in the paper "Higher Education Funding in Arizona and Utah" (https://wpcarey.asu.edu/sites/default/files/uploads/center-competitiveness-and-prosperity-research/fundingazut05-15.pdf). Combined state and local government funding for higher education per full-time-equivalent student was higher in Arizona than in Utah between 2000 and 2010, by between 5-and-14 percent. By 2014, however, the figure in Arizona was nearly 10 percent less than in Utah. In 2014, Arizona's funding was 19 percent less than the national average, ranking 34th among the 50 states. Utah's funding was 10 percent less than average and ranked 27th. Among 10 western states, Arizona ranked eighth and Utah seventh.

Elementary and Secondary Education. Funding for elementary and secondary (K-12) education also was touched upon in the earlier paper. For decades, funding per student in Arizona has been higher than in Utah. In the mid-1960s, the funding level was above the national average in Arizona and only a little below average in Utah. The current funding level is far below average in both states.

More detail on K-12 funding, and expenditures, is provided in this subsection. Data from the Public Elementary-Secondary Education Finance series produced by U.S. Department of Commerce's Census Bureau are used. Data for fiscal years 1992 through 2013 are available online at http://www.census.gov/govs/school/.

Revenues raised to support K-12 education are divided by the Census Bureau into three government sources: federal, state, and local. In FY 2013 nationally, 9 percent of the revenue came from the federal government, with the balance nearly equally split between state (46 percent) and local (45 percent) governments. In Arizona, federal funding made up a larger share (15 percent) and local funding was disproportionately used (49 percent versus 36 percent from state government). In Utah, state funding was disproportionately used (52 percent versus 38.5 percent from local governments; federal funding accounted for 9.5 percent). Since the local/state government responsibilities for funding K-12 education vary across the states, combined state and local government figures need to be used to compare states.

The Census Bureau separates capital outlays for K-12 education from other expenditures, splitting the latter into current operations and other expenditures (the latter consisting largely of interest payments for debt). Capital outlays are subdivided into construction, land and existing structures, instructional equipment, and other equipment. In FY 2013 nationally, 89 percent of the expenditures were for current operations, 8 percent were for capital outlays, and 3 percent were for other purposes. These shares in Arizona were similar to the national average. In contrast, in Utah, a higher proportion of the total went to capital outlays (15 percent) and less to current operations (82 percent).

Expenditures for current operations are split into three subcategories. The instruction subcategory is the largest, accounting for 61 percent of current operations nationally in FY 2013; the share was 63 percent in Utah and 56 percent in Arizona. The instruction category includes wages and salaries, employee benefits, and purchases of supplies directly related to instruction. The second subcategory of support services accounted for 34 percent of current operations nationally, with a higher share in Arizona (39 percent) and a smaller share in Utah (29 percent). Support services consist of seven parts: pupil support, instructional staff support, "general" administration (school districts), school administration, plant operations and maintenance, pupil transportation, and other (business support, such as printing, and central support, such as planning). The third subcategory includes such functions as food services and adult education. It accounted for 5 percent of the total nationally and in Arizona, and 8 percent in Utah.

The following analysis focuses on the per student measure, reporting the Arizona and Utah figures as a percentage of the national average and as a rank among the states (with the District of Columbia included). The FY 2013 figures are adjusted for the cost of living, though this adjustment has little impact on either the ranks or the percentages of the national average, for either Arizona or Utah. Relative to the per student measure, the percentages of the U.S. average are considerably higher on the per student per $1,000 of per capita personal income measure (by 21 percent in Arizona and more than 22 percent in Utah). The difference in the rank between the per student measure and the per student per $1,000 of per capita personal income measure varies by category in Arizona and Utah.

K-12 education finance in Arizona and Utah in FY 2013 is compared in Table 2. Total revenues exceeded total expenditures in Arizona, while expenditures were greater than revenues in Utah. Thus, comparisons of the two states vary depending on whether the revenue or expenditure figures are examined. Total dollar values are presented in the table to provide the relative size of the various categories. Otherwise, the table presents figures per student, adjusted for the cost of living.

Per student K-12 education *revenues* in FY 2013 in Arizona and Utah were far below the national average, by 29 percent in Arizona and 36 percent in Utah. Each ranked among the bottom three states. Arizona was further below average looking only at state and local government revenue. It received above-average amounts of federal funding, while Utah's federal funding was far below average.

Per student K-12 education *expenditures* in FY 2013 in Arizona and Utah also were far below the national average, by 33 percent in Arizona and 32 percent in Utah. Each ranked near the

bottom of the states. While total spending per student was a bit lower in Arizona, per student spending on current operations was lower in Utah.

Capital outlays per student were much higher in Utah than Arizona: 31 percent above average versus 38 percent below average. A large differential existed in each of the four categories of capital outlays. Spending per student for purposes other than current operations and capital

TABLE 2
ELEMENTARY AND SECONDARY EDUCATION FINANCE, FISCAL YEAR 2013

	Dollars in Millions		Per Student, Adjusted for Cost of Living Rank*		Percentage of U.S. Average	
	Arizona	Utah	Arizona	Utah	Arizona	Utah
Total Revenues	$8,098	$4,302	49	51	70.7%	63.6%
Federal Government	1,178	410	19	50	113.1	66.6
State and Local Government	6,920	3,892	49	50	66.4	63.2
State Government	2,934	2,236	50	46	56.1	72.4
Local Government	3,985	1,656	32	44	76.8	54.1
Property Tax	3,016	1,466	25	32	89.3	73.5
Other	969	190	29	48	53.5	17.7
Total Expenditures	7,595	4,581	50	49	66.5	67.9
Current Operations	6,837	3,768	49	51	67.2	62.7
Instruction	3,824	2,361	51	50	62.1	64.9
Support Services	2,644	1,097	49	51	75.9	53.3
Pupil Support	534	129	25	51	96.1	39.4
Instructional Staff Support	386	148	39	49	83.1	53.9
General Administration	81	36	47	50	42.9	32.1
School Administration	318	218	51	50	58.7	68.0
Plant Operations & Maintenance	771	342	42	51	82.5	62.0
Pupil Transportation	332	125	41	49	74.0	47.1
Other Support Services	222	100	40	45	63.7	48.4
Other Current Operations	369	309	48	33	69.9	99.3
Capital Outlays	558	698	44	17	62.0	131.3
Construction	390	438	39	21	56.8	107.9
Land and Structures	18	119	34	6	31.6	348.3
Equipment: Instructional	34	43	34	15	88.9	185.9
Equipment: Other	116	99	30	15	98.8	143.2
Other Expenditures	200	114	32	34	55.7	53.9
Interest on Debt	200	113	29	33	61.2	58.9
Payments to Other Governments	0	1	17	15	1.6	4.4

* Among the 50 states and the District of Columbia; a rank of 1 indicates the highest revenues or expenditures.

Source: U.S. Department of Commerce, Census Bureau, Public Elementary-Secondary Education Finance, http://www.census.gov/govs/school/ (education finance and number of students) and U.S. Department of Commerce, Bureau of Economic Analysis, http://www.bea.gov/regional/index.htm (cost of living).

outlays consists almost entirely of interest payments on debt. The amount per student was similar in the two states.

The current operations category is the key to evaluating how well a state supports public education. Per student current operations spending was 33 percent below the national average in Arizona and 37 percent below average in Utah. In each state, per student expenditures were below average in each of the current operations categories. Per student spending was a little higher in Utah than in Arizona in the instructional category and considerably higher in the other current operations category. Arizona spent more per student on each of the support services except for school administration.

A summary of the change in education finance between FYs 1992 and 2013 is presented in Table 3. Fiscal year 1992 was selected as the starting year both for the sake of convenience (it is the first year of data available online) and because after FY 1992, Arizona began a series of tax reductions that have limited the amount of funding available to K-12 education. The 21-year period is split into three parts: the period since the high point of the previous economic cycle in FY 2008 and the prior 16 years divided evenly into eight-year periods. The table presents the change in the percentage of the national average in each state. For example, total revenue per student in Arizona was 88 percent of the national average in FY 1992 and 80 percent of average in FY 2000; the difference of 8 percentage points is reported in the table.

Relative to the national average, per student total revenue fell in each of the three time periods in Arizona. A large decline in state funding occurred between FYs 2008 and 2013. In Utah, the percentage of the U.S. average rose between FYs 1992 and 2000, then fell back to near the FY 1992 value after FY 2000.

Relative to the national average, total K-12 spending per student fell considerably in Arizona between FYs 1992 and 2000 and again between FYs 2008 and 2013, with declines in both capital outlays and current operations. Capital outlays vary widely by year as projects begin and end. Thus, the changes between specific years shown in Table 2 should be interpreted with caution. In contrast to Arizona, total expenditures per student in Utah rose slightly versus the U.S. average between FYs 1992 and 2013, with little change in current operations.

In Arizona, per student spending on instruction and on support services fell between FYs 1992 and 2013 relative to the national average. In both categories, spending in Utah relative to the U.S. average rose between FYs 1992 and 2000, dropped between FYs 2000 and 2008, and increased between FYs 2008 and 2013, resulting in little change overall.

Within the support services category, per student spending fell sharply in Arizona relative to the U.S. average in the general administration category, which includes school district offices. Significant decreases also occurred in the school administration category. In contrast, gains versus the national average occurred in the pupil support category between FYs 1992 and 2008. In Utah, per student gains and losses relative to the nation were fairly small in the support services subcategories, except for the other support services category.

TABLE 3
ELEMENTARY AND SECONDARY EDUCATION FINANCE, FISCAL YEARS 1992 THROUGH 2013

	Change in Percentage of U.S. Average, Per Student					
	1992-to-2000		2000-to-2008		2008-to-2013	
	Arizona	Utah	Arizona	Utah	Arizona	Utah
Total Revenues	-8	6	-8	-5	-10	-3
Federal Government	-15	5	-15	0	4	-8
State and Local Government	-7	6	-8	-5	-11	-3
State Government	-5	7	-1	-7	-23	-6
Local Government	-9	3	-17	-3	1	1
Property Tax	-8	8	-15	-1	-7	4
Other	-5	-4	-19	-6	13	-7
Total Expenditures	-13	4	-5	-1	-15	0
Current Operations	-5	6	-5	-9	-9	2
Instruction	-8	6	-6	-9	-9	2
Support Services	-4	3	-5	-7	-8	3
Pupil Support	10	11	5	-8	-5	0
Instructional Staff Support	-23	0	-3	-7	29	0
General Administration	-56	9	-13	-1	-13	-2
School Administration	-7	6	-11	-7	-11	3
Plant Operations & Maintenance	7	5	-14	-9	-12	6
Pupil Transportation	-8	9	11	-4	-8	0
Other Support Services	23	-33	-4	-5	-44	10
Other Current Operations	11	21	-6	-10	-16	-4
Capital Outlays	-94	-10	9	57	-50	5
Other Expenditures	-64	-7	-50	-14	-62	2

Source: U.S. Department of Commerce, Census Bureau, Public Elementary-Secondary Education Finance, http://www.census.gov/govs/school/.

Test Scores

The National Assessment of Educational Progress (NAEP), also known as the "Nation's Report Card," is the largest nationally representative and continuing assessment of student achievement. Tests are conducted periodically in various subjects, particularly reading and mathematics, and are primarily given to fourth- and eighth-graders. Since only a small portion of students take this test, sampling error can be an issue at the state level. Results are available from the U.S. Department of Education's National Center for Education Statistics (NCES) at http://www.nationsreportcard.gov/.

The fourth-grade reading test was administered nine times between 1992 and 2013 in both Arizona and Utah. Each time, the scores of Arizona's students were significantly lower than those of students in Utah and nationally. Utah's scores ranged from about equal to the U.S. average to higher than average; the score in 2013 was a little above average. The eighth-grade reading test was administered six times between 2003 and 2013 in both Arizona and Utah. Each time, the scores of Arizona's students were significantly lower than those of students in Utah and nationally, while Utah's scores were slightly-to-significantly higher than the U.S. average.

The fourth-grade mathematics test was administered eight times between 1992 and 2013 in both Arizona and Utah. The scores of Arizona's students were significantly lower than those of students in Utah and nationally in each period except for 2013, when the scores were only slightly lower. Utah's scores ranged from equal to the national average to higher than average; the score in 2013 was a little above average. The eighth-grade mathematics test was administered eight times between 1996 and 2013 in both Arizona and Utah. Each time, the scores of Arizona's students were significantly lower than those of students in Utah and nationally. Recently, Utah's scores were equal to the U.S. average; Utah students had scored above average on earlier tests.

The eighth-grade science test was administered in 2009 and 2011 in both Arizona and Utah. Each time, the scores of Arizona's students were significantly lower than the national average, while the scores in Utah were significantly higher than the national average.

Student achievement is affected by a number of conditions, including income, whether English is a child's first language, and the educational attainment of a child's parents. Since these factors are correlated to race/ethnicity, significant variations in test scores are seen across the racial/ethnic groups. Some of the test results are cross-tabulated by these characteristics by the NCES.

Nationally, English language learners scored far below other students on the reading test, in both the fourth grade and the eighth grade. There was a direct and significant relationship between the educational attainment of parents and the test scores of children on the eighth-grade math test. By race/ethnicity, non-Hispanic whites and Asians scored much higher than other groups on the fourth-grade reading, eighth-grade math, and eighth-grade science tests. Asians scored higher than whites on reading and math.

Significant differences are present between Arizona and Utah in such characteristics as income, poverty, and educational attainment of parents, with Utah comparing more favorably on each characteristic. The racial/ethnic mix also is considerably different in the two states, with 80 percent of Utah's residents being non-Hispanic white, compared to 57 percent in Arizona. A more accurate comparison of student achievement between the two states would consider such differences. However, test scores are not available for all categories, especially in Utah, because of the small sample size in some groups.

English language learners have identical reading scores in the two states, well below the national average. The reading scores of other students are considerably lower in Arizona than Utah; the latter's scores are a little above the national average.

Among children whose parents have limited educational attainment, Arizona's eighth-grade math scores were higher than in Utah and about equal to the national average. Among children whose parents have greater educational attainment, Arizona's eighth-grade math scores were a little lower than in Utah and the national average. Thus, Arizona's lower overall score on eighth-grade mathematics can essentially be explained by the lower educational attainment of parents.

The only racial/ethnic groups that can be compared between Arizona and Utah are non-Hispanic whites and Hispanics. On fourth-grade reading and eighth-grade math, the scores of non-

Hispanic whites were similar in Arizona and Utah and not much different from the U.S. average. Hispanics scored higher in Arizona than Utah, though still a little below the national average. On the eighth-grade science test, however, both non-Hispanic whites and Hispanics scored lower in Arizona than in Utah and also lower than the national average.

Thus, while students in Utah score higher than students in Arizona overall, demographic factors explain the differentials in reading and math. Utah's students still perform better in science. In terms of economic development, however, the lower overall scores in Arizona are a significant negative factor, while Utah's above-average scores are a positive factor.

Educational Attainment

Data on educational attainment come from the American Community Survey (ACS) produced by the U.S. Census Bureau. In order to reduce sampling error, data for the five years from 2009 through 2013 are used in this subsection.

Most commonly, the Census Bureau expresses educational attainment for the population aged 25 and older. Educational attainment often is measured as either the percentage with at least a high school diploma or the percentage with at least a bachelor's degree. On the former measure, Arizona's attainment over the 2009-to-2013 period was equal to the national average, while Utah was above average. In both Arizona and Utah, a disproportionate share of residents 25 and older had some college or an associate's degree as their maximum attainment. However, on the bachelor's degree-or-more measure, Arizona was below the national average and Utah was not much above average (see Table 4).

Educational attainment is an important indicator of the quality of the labor force, but is not a direct measure of the quality of a state's educational system since so many residents have migrated from one state to another state, or immigrated from another country. Those born and living in the same state likely were educated in that state (through grade 12). While many of those who moved to a state were educated elsewhere, some may have moved as a child and been educated in the state in which they are living.

Among those living in the same state in which they were born, educational attainment in Utah was higher than the national average while the share with at least a bachelor's degree was below average in Arizona. Those who migrate across state lines are better educated than those living in the state in which they were born, as seen in Table 4. The share of interstate migrants living in Utah that had at least a bachelor's degree was about the same as the national average over the 2009-to-2013 period, while the share in Arizona was considerably below average. The proportion of the foreign-born population with at least a bachelor's degree was not much lower nationally than those born as U.S. citizens, but immigrants to Arizona and Utah were relatively less well educated.

Among the racial/ethnic groups nationally and in Arizona and Utah, educational attainment as measured by the share with at least a bachelor's degree was much higher among Asians than in any other group. Hispanics and Native Americans had the lowest proportions. In Arizona and Utah, the percentages with at least a bachelor's degree were a little above the national average among blacks and whites, but below average among Hispanics and Native Americans.

TABLE 4
PERCENTAGE WITH AT LEAST A BACHELOR'S DEGREE, 2009-13 AVERAGE

	United States	Arizona	Utah
Age 25 and Older Total	28.8%	26.9%	30.3%
Age 18 to 24	9.4	6.9	6.0
Age 25 to 34	31.9	25.5	29.9
Age 35 to 44	32.3	28.3	32.2
Age 45 to 64	28.9	27.7	30.6
Age 65 and Older	22.3	25.4	27.7
Born in Same State	24.3	19.2	27.4
Born in Different State	36.5	31.7	37.0
U.S. Citizen Born Outside the United States	27.7	31.1	37.5
Foreign Born	27.7	19.6	21.9
Living in Poverty	10.8	10.3	14.6
Not Living in Poverty	31.7	29.9	32.1
White	32.1	32.7	32.7
Black	18.6	22.1	20.7
Hispanic	13.6	10.8	12.3
Asian	50.6	51.6	43.7
Native American	13.5	9.3	11.3
Age 25 to 64 Total	30.5	27.3	30.8
Employed	35.1	31.8	33.7
Unemployed	18.1	15.2	16.9
Not in Labor Force	19.2	18.3	23.6

Source: U.S. Department of Commerce, Census Bureau, American Community Survey, Tables S1501, B06009, B15002, B17003, and B23006, http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml.

As with the achievement measures, educational attainment is correlated to various socioeconomic factors; attainment is much lower among those living in poverty. The poverty level varies with household size, rising by $4,160 per person from the $11,770 figure for a single person. For example, a family of three earning $25,000 is not classified as living in poverty, while a family of five with the same earnings is designated as living below the poverty level. Among those 25 and older living in poverty, the percentage with at least a bachelor's degree was higher in Utah than nationally. Utah's higher educational attainment among those in poverty likely reflects the larger family sizes in Utah rather than very low household incomes.

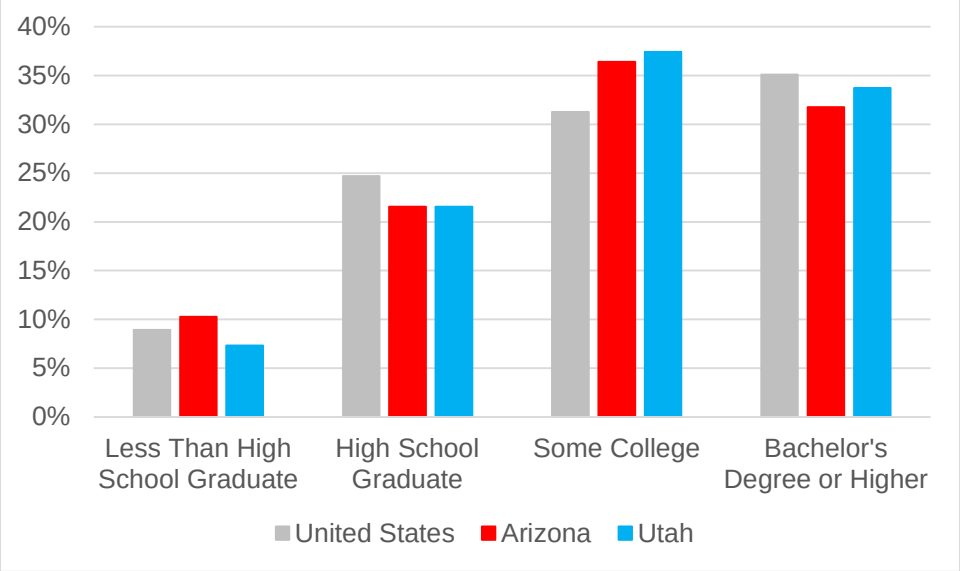
Utah's percentage with at least a bachelor's degree was below the national average among those 25-to-44 years old, but above average among those 45 and older, especially among those 65 and older. In Arizona, the attainment of those 25-to-44 years old was considerably below the national average, and the attainment of those 45-to-64 years old was below average. However, the attainment of those 65 and older was above average.

Thus, in both Arizona and Utah, the standard presentation of educational attainment for those 25 and older overrates educational attainment in terms of economic development. Not only should retirees be excluded, but others not in the labor force also distort the educational attainment figures. The Census Bureau produces a table of those from 25-to-64 years of age, subdivided by those employed in civilian jobs, those unemployed, those in the armed forces, and those not in the workforce. Among those employed, the educational attainment in Utah and especially in Arizona was inferior to the national average during the 2009-to-2013 period, as seen in Chart 3. Among those not in the labor force, educational attainment in Utah was much higher than the national average; Arizona was not much different from the nation. In Utah, women are well educated, but a higher proportion do not participate in the labor market during their child-bearing years.

Median earnings vary directly with educational attainment. Of those 25 and older with earnings (including those working part time), the overall median nationally was $35,644. The median ranged from $19,652 among those who had not graduated from high school to $66,493 among those with a graduate degree.

The overall median earnings figures in Arizona and Utah were less than the national average. After adjusting for the cost of living, Arizona's figure was 3 percent less than the national average, while the Utah figure was at the average. Except in the some college/associate's degree category, Arizona's adjusted median earnings were a little below the national average in each educational attainment category. In contrast, adjusted median earnings in Utah was well above average for those with high school or less as their maximum educational attainment, but below average for those with more educational attainment.

CHART 3
EDUCATIONAL ATTAINMENT OF WORKERS
BETWEEN THE AGES OF 25 AND 64, 2009-13 AVERAGE



Source: U.S. Department of Commerce, Census Bureau, American Community Survey, Table B23006, http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml.

Other Educational Measures

The NCES provides considerable data on K-12 education. Consistent with the much lesser funding per K-12 student in Arizona and Utah, the pupil-teacher ratio is considerably higher than the national average in Arizona and Utah. In fall 2011, the figure was 21.3 in Arizona and 23.1 in Utah, compared to the national average of 16.0. An alternative measure of average classroom size indicated that the figures in elementary schools were 24.1 in Arizona, 27.4 in Utah, and 21.2 nationally. In secondary schools, the figures were 27.7 in Arizona, 31.5 in Utah, and 26.8 nationally.

Teachers in Arizona and Utah on average have fewer years of classroom experience and have lesser educational attainment than the national average. Nationally, 56 percent of teachers have earned at least a master's degree, compared to 51 percent in Arizona and 39 percent in Utah. Only 9 percent of teachers nationally have fewer than three years of experience, compared to 16 percent in Arizona and 15 percent in Utah. The percentage nationally with at least 10 years of experience is 58, compared to 46 in Arizona and 45 in Utah.

Since teachers in Arizona and Utah have less educational attainment and fewer years of experience, the average teacher's salary in Arizona and Utah is less than the national average, by considerably more than can be explained by the cost of living. However, a table of the average base salary of teachers with a master's degree, subdivided by the number of years of experience, indicates that salaries in both states, especially Arizona, are considerably below the national average even after adjusting for the educational attainment and experience of teachers.

The reported percentage of high school students graduating with a regular high school diploma in four years varies significantly by year (see Table 5); various difficulties compromise the accuracy of the graduation rates. Thus, conclusions cannot be made regarding graduation rates in Arizona and Utah. Relative to Utah, the 2011 data suggest that Arizona's performance is better; the 2012 data suggest that Arizona's inferior performance can be explained by demographic factors; but the 2013 data suggest that Arizona lags behind Utah even after considering differences in the racial/ethnic mix.

Infrastructure

The American Society of Civil Engineers (ASCE) has issued report cards on the status of the physical infrastructure in the last several years for 30 states (http://www.infrastructurereportcard.org/). A national report card also is produced by the ASCE, providing a grade for each of 16 categories. None of the states evaluate all 16 categories and some states report on additional categories. An overall grade is reported, but since the components of the infrastructure that are examined vary by state, the overall grade is not directly comparable from one state to another.

The latest grades for the nation, Arizona and Utah are shown in Table 6 by category, along with the median grade of those states evaluating each category. In most categories, the national grade is lower than the median grade of the states. Of the seven categories evaluated in both Arizona and Utah, Utah scores more highly on six, though the differential is small in three of these. The letter grade for Utah is two higher than in Arizona for roads and one higher for transit and dams, but is one lower for levees.

TABLE 5
HIGH SCHOOL GRADUATION RATES AT PUBLIC SCHOOLS, REGULAR DIPLOMA IN FOUR YEARS

		United States	Arizona	Utah
2011	Total	79%	78%	76%
2012	Total	80	76	80
	White	86	84	83
	Black	69	71	64
	Hispanic	73	70	66
	Asian	88	84	78
	Native American	67	63	64
2013	Total	81	75	83
	White	87	83	86
	Black	71	70	70
	Hispanic	75	69	70
	Asian	89	84	80
	Native American	70	61	67
	Economically Disadvantaged	73	69	73
	Limited English Proficiency	61	20	60
	Students With Disabilities	62	63	67

Source: U.S. Department of Education, National Center for Education Statistics, https://nces.ed.gov/ccd/data_tables.asp.

In most of the categories reported in the Utah study, Utah's grade is above the median of the reporting states; it is at the top for bridges, roads, transit, and dams. However, it ranks at the bottom for levees. In the categories reported in the Arizona study, Arizona generally is at or above the median of the states. The exception is roads.

State and local governments have a limited role in providing some types of infrastructure, such as railroad transportation and energy production. Other parts of the physical infrastructure are largely provided by the public sector, including roads and public schools.

The Census Bureau reports the capital outlays of state and local governments by state, overall and for some types of spending. The latest data are for FY 2012. In that year, Arizona's total capital outlays relative to personal income were a little below the national average, while Utah's outlays were far above the U.S. average. Utah spent substantially more in each of the major components of highways, K-12 education, and higher education.

Capital outlays can vary considerably from year to year. After smoothing out the fluctuations, Arizona's capital outlays relative to personal income have declined over time, while expenditures have increased somewhat in Utah.

Looking at the totals for FYs 1992 through 2012 relative to personal income, total capital outlays in Arizona and Utah were above the national average, by 19 percent in Arizona and 47 percent in Utah. Capital outlays typically are higher in states with rapid population growth; highway costs

TABLE 6
INFRASTRUCTURE GRADES

	United States	Median State	Number*	Arizona	Utah
Overall**	D+	C-	29	C	C+
Transportation:					
Aviation	D	C	22	B-	
Bridges	C+	C-	24	B	B+
Inland Waterways	D-	D+	9		
Ports	C	C+	4		
Rail	C+	C	18	C+	
Roads	D	C-	30	D+	B+
Transit	D	D+	18	C+	B+
Waste:					
Solid Waste	B-	B-	15		B-
Hazardous Waste	D	C+	3		C+
Water Related:					
Canals		C-	2		D+
Dams	D	C-	27	C-	B-
Drinking Water	D	C-	23	C-	C
Levees	D-	C-	13	C-	D-
Wastewater	D	C-	29	C	C+
Other:					
Energy	D+	C+	15		
Parks & Recreation	C-	C	6		
Schools	D	C-	17		

Note: A blank indicates that no evaluation was made in that category.
* Number of states producing an evaluation.
** The overall grades should not be compared due to the varying components of the infrastructure examined by state.

Source: American Society of Civil Engineers, http://www.infrastructurereportcard.org/.

are higher in large states with a low population density. Cumulative capital spending relative to personal income was greater in Utah than in Arizona overall (by 19 percent) and in each of the major categories: by 34 percent for higher education, 13 percent for K-12 education, and 31 percent for highways.

Other Economic Development Factors

Other than the quality and availability of the labor force and the quality and availability of the physical infrastructure, various costs constitute the next-most important business location factor. The cost of labor is the most significant of the cost factors, with taxes, real estate prices, and energy costs among the other cost factors relevant to economic development. Public policy has little effect on most of the costs, with the exception of taxes.

In order to attract and retain workers, a company must consider location factors important to individuals as well as the factors important to the business. Employment opportunities and wages are the most important considerations for those in the workforce. The quality of life — better described as the "quality of place" — is important to individuals. It has many aspects, such as the

cost of living, crime, and cultural and recreational opportunities. Fiscal factors also are considered by individuals — the level of personal taxes relative to the availability and quality of public services, including the transportation system and the education system.

While the relative importance of location factors vary between businesses and individuals, most factors are relevant to both groups and are viewed similarly. For example, a strong transportation infrastructure is evaluated positively by each group. Wages/labor costs are the primary factor viewed inconsistently by the two groups.

Tax Burden

Taxes are not of particular significance as a component of regional economic competitiveness, especially to innovative and productive traded-sector companies. While federal taxes can be a significant cost, state and local taxes are of much lesser magnitude. Taxes are evaluated by both businesses and individuals relative to the quality and availability of valued public services. However, taxes receive disproportionate attention by the media and in most studies of regional economic competitiveness.

Tax burdens are somewhat correlated to aggregate economic growth rates, but are not correlated to either the level or the growth rate of productivity and prosperity measures. However, the correlation between taxes and aggregate growth does not indicate that low taxes are causing the faster growth. Most fast-growing states are in the South or West, where climate or other factors may be the root cause of the faster growth. Rather than prompting faster growth, tax reductions often have occurred in response to strong economic growth, which creates a surplus in public-sector budgets.

While many studies have been released that compare tax burdens across states or other geographic areas, most are unreliable due to methodological and data shortcomings. Even the methodologically strong studies reviewed below may be misleading due to misreporting of data by state and local governments.

Total Taxes. A measure of the overall tax burden — including taxes paid by individuals and businesses — can be calculated from data reported annually by the Census Bureau in its State and Local Government Finance series (http://www.census.gov/govs/local/). The latest data are for FY 2012. To compare areas, the Census Bureau's data can be expressed either per capita or per $1,000 of personal income.

On a per capita basis, the overall state and local government tax burden in Arizona in FY 2012 was 23 percent less than the national average; the state ranked 42nd among the 50 states and the District of Columbia. The tax burden was slightly lower in Utah at 24 percent below average, ranking 44th. Since per capita personal income is considerably below the national average in both Arizona and Utah, the tax burden is higher per $1,000 of personal income. Arizona was 8 percent below average, ranking 36th, and Utah was 6 percent below average, ranking 33rd.

On a per capita basis, the general sales tax burden in Arizona was considerably above the national average (the temporary increase in the sales tax rate from June 2010 through May 2013 is reflected in these figures). The burden of nearly every other tax was substantially below

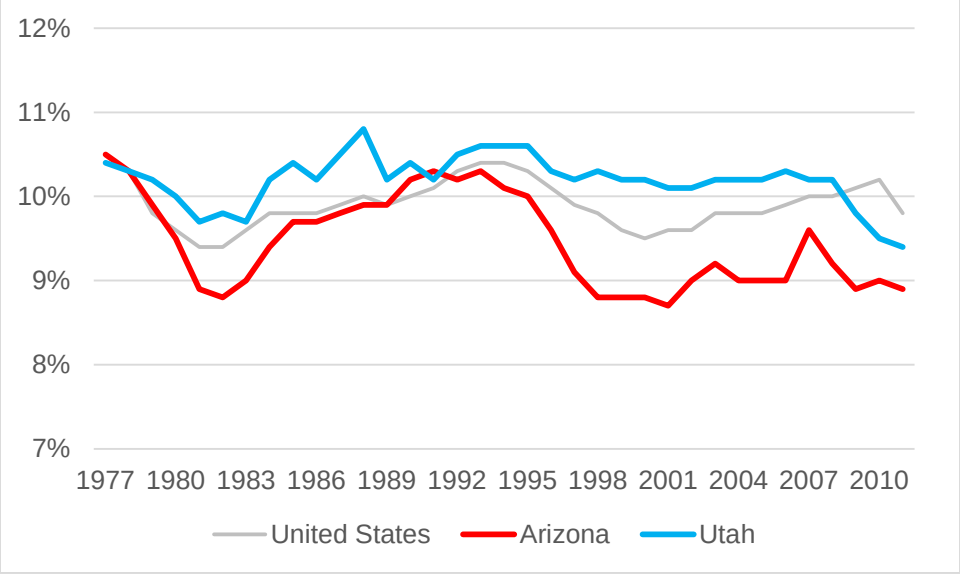
average in Arizona. In Utah, the per capita figure was below average for each tax, with most taxes moderately below average.

The Tax Foundation provides a comparison of total state and local government taxes by state from 1977 through 2011 using a methodology different from that of the Census Bureau in its "Annual State-Local Tax Burden Ranking" (http://taxfoundation.org/article/annual-state-local-tax-burden-ranking-fy-2011). Nationally, the state and local government tax burden has fluctuated over time (see Chart 4). Arizona's tax burden was below the national average from 1992 through 2011, with a large differential from 1997 through 2011. In contrast, Utah's tax burden generally was somewhat higher than the U.S. from 1977 through 2008, but then dropped below average. In 2011, Arizona ranked 34th and Utah 28th among the states, slightly higher than the ranks for the personal income measure using the Census Bureau's data.

Individual Taxes. An annual study of state and local government taxes paid by individuals is produced by the government of the District of Columbia. Its methodology differs from that of the other tax studies. For a hypothetical family of three living in the largest city in each state and the District of Columbia, the amount of state and local government taxes paid are calculated based on the applicable tax laws for four types of taxes at each of five income levels, ranging from $25,000 to $150,000.

Phoenix and Salt Lake City are compared to the median of the 51 cities in Table 7. The total of the four types of taxes in 2013 was lower in Phoenix than in Salt Lake City except at the lowest income level. The individual tax burden at each income level (except $25,000 in Phoenix) was

CHART 4
STATE AND LOCAL GOVERNMENT TAX BURDEN:
PER CAPITA TAXES PAID AS A PERCENTAGE OF PER CAPITA INCOME



Source: Tax Foundation, "Annual State-Local Tax Burden Ranking," http://taxfoundation.org/article/annual-state-local-tax-burden-ranking-fy-2011.

TABLE 7
TAXES PAID BY INDIVIDUALS IN 2013
AS A PERCENTAGE OF THE MEDIAN OF 51 CITIES

	Household Income				
	$25,000	**$50,000**	**$75,000**	**$100,000**	**$150,000**
Total:					
Phoenix	100.0%	91.8%	89.4%	85.9%	85.9%
Salt Lake City	95.5	94.7	95.8	93.7	91.5
Income Tax:					
Phoenix	*	36.3	43.8	49.5	51.2
Salt Lake City	*	100.4	100.4	106.8	102.8
Property Tax:					
Phoenix	93.3	105.6	103.1	99.0	93.7
Salt Lake City	93.6	80.1	78.2	75.1	71.1
Sales Tax:					
Phoenix	145.9	143.4	138.0	142.9	142.3
Salt Lake City	126.8	125.3	118.0	122.5	120.5
Automotive Taxes:					
Phoenix	92.5	103.8	98.8	100.4	151.8
Salt Lake City	115.8	111.8	104.5	100.0	101.3

* Income tax payments at this income level are near zero.

Source: Government of the District of Columbia, *Tax Rates and Tax Burdens in the District of Columbia — A Nationwide Comparison, 2013*, http://cfo.dc.gov/node/215912.

below the median of the 51 cities in both Phoenix and Salt Lake City, with the differential largest at the highest income level.

In Salt Lake City and especially in Phoenix, the sales tax burden was considerably above the median of the cities. In Phoenix, this was offset by an income tax burden far below the median. In Salt Lake City, the property tax burden was considerably below the median.

Business Taxes. The annual study of "Total State and Local Business Taxes," produced by Ernst & Young for the Council on State Taxation (http://www.cost.org/WorkArea/DownloadAsset.aspx?id=87982), is limited to payments made by businesses. The amount of effort and sophistication in the Ernst & Young study greatly exceeds that of other business tax studies.

Unlike the Tax Foundation study, all taxes paid by businesses are included in the Ernst & Young study, organized into seven categories of business taxes: property, sales, excise, corporate income, individual income, unemployment insurance, and license and other taxes, such as severance taxes. The amount of taxes paid by businesses during fiscal year 2013 was determined through a combination of detailed data collection and modeling. The total amount of taxes paid is divided by private-sector gross domestic product, with the result called the total effective business tax rate (TEBTR).

Ernst & Young warns that the TEBTR is only a starting point and is not sufficient to assess competitiveness:

- The TEBTR measures the average tax burden of existing businesses, not the marginal tax that would be borne by a company investing in a new facility.
- TEBTRs do not indicate economic incidence — the ability to pass the tax to consumers outside the state. This is of particular importance to severance taxes in states with oil reserves.
- Two states with equal TEBTRs may vary in their taxation by industry. For example, one state may have high taxes on capital-intensive manufacturers and low taxes on labor-intensive service industries.
- A state with a below-average TEBTR that derives most of its business tax revenue from origin taxes — such as property and sales — may not be as competitive as a state with a higher TEBTR that relies on taxes that have a larger impact on out-of-state businesses.

Arizona and Utah are compared to the national average in Table 8. The overall business tax burden in FY 2013 was considerably higher in Arizona than in Utah, though the differential may be exaggerated by what appears to be an overstatement of the property tax burden in Arizona. The property tax and sales tax burdens in Arizona were above the national average (the reported sales tax burden includes the temporary sales tax increase, which was in place for 11 of the 12 months covered by the Ernst & Young study). The burden of each of the other taxes was considerably below average. In contrast, Utah's tax structure was more balanced, with each of the taxes at or below the national average.

On average, businesses pay a disproportionate share of the state and local government taxes collected in Arizona — 51 percent versus 45 percent nationally and 43 percent in Utah. The actual tax burden varies by company. In Arizona, very small unincorporated businesses generally pay relatively little in taxes relative to counterparts in other states, in part because they pay income taxes based on the very low individual rates rather than the corporate rates, and in part since they typically own limited amounts of property and therefore are not as subject to the state's high business property taxes. In contrast, large industrial companies that own considerable property — which make up a large share of Arizona's traded-sector economy — pay a high

TABLE 8
TAXES PAID BY BUSINESSES IN FISCAL YEAR 2013

	Total Effective Business Tax Rate as a Percentage of the U.S. Average		Share of Business Taxes	
	Arizona	Utah	Arizona	Utah
TOTAL	109.8%	84.3%	100.0%	100.0%
Property Tax	131.8	88.2	43.2	37.4
Sales Tax	175.5	89.8	32.9	21.3
Excise Taxes	74.1	91.4	8.4	12.6
Corporate Income Tax	81.1	70.3	5.5	7.4
Unemployment Insurance Tax	47.2	97.2	3.6	8.0
Individual Income Tax	50.0	100.0	2.7	6.5
License and Other Taxes	37.0	56.5	3.7	6.7

Source: Ernst & Young, *Total State and Local Business Taxes: State-by-State Estimates for Fiscal Year 2013*, http://www.cost.org/WorkArea/DownloadAsset.aspx?id=87982.

amount in state and local taxes relative to counterparts in other states. These businesses pay a relatively high price for their consumption of public services and physical infrastructure, while the smallest businesses and individuals pay relatively little for their consumption of public services and physical infrastructure.

The Ernst & Young study also provides estimates of business taxes per dollar of government expenditures that benefit businesses. Business taxes in Arizona were higher than average relative to the services businesses receive. In contrast, business taxes in Utah were lower than average relative to the services businesses receive. Thus, despite a low overall tax burden, Arizona did not compare favorably on the location factor of the amount of business taxes paid relative to the public services and infrastructure used by businesses; this factor was particularly negative for large traded-sector companies. Business tax cuts currently being phased in will improve Arizona's position, probably dropping Arizona's total to slightly below average. However, business property and sales tax payments will still be quite high.

High Technology and Innovation

Three indicators of human capital and three measures of financial capital that are related to technology have been selected for comparison. The economic literature on regional economic growth stresses the importance of high-quality human capital in the workforce. In order for smaller companies to grow, financial capital must be available.

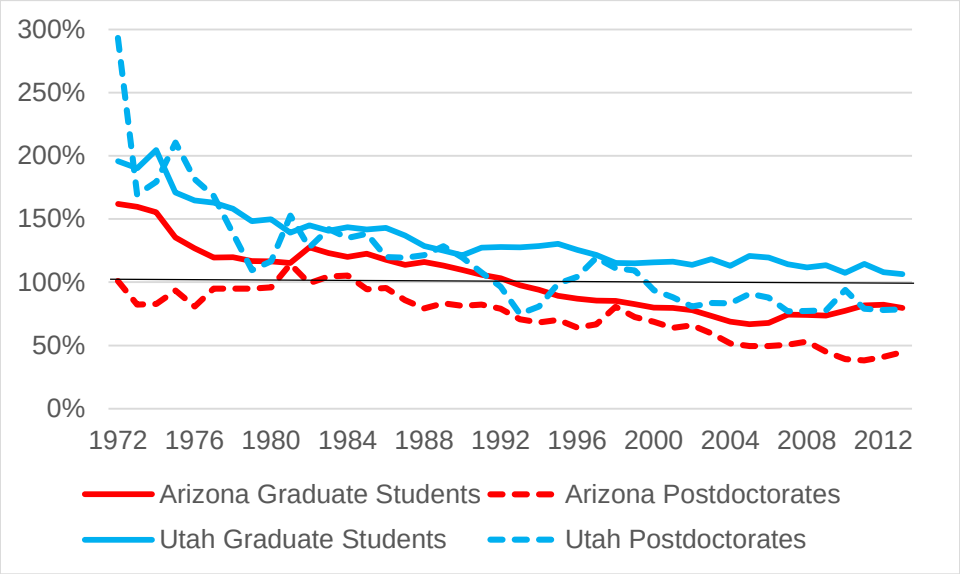
Human Capital. Graduate education at a state's universities is a source of high-quality human capital. Science and engineering specialties are of particular importance to innovation. The first indicator, which is expressed on a per capita basis, consists of two parts: the number of graduate students enrolled and the number of postdoctoral appointees in science, engineering and health disciplines at doctorate-granting institutions. Annual data dating back to 1972 are available from the National Science Foundation (NSF).

Arizona and Utah were far above the U.S. average on the per capita number of graduate students in science and engineering during the 1970s, but have declined relative to the nation since then (see Chart 5). Arizona has been below the national average since the early 1990s; the differential was 20 percent in 2013. Utah remains above average, though only by 7 percent in 2013. Arizona's figures have been lower than in Utah throughout the time series; the differential in 2013 was 25 percent.

Through 1999, the per capita number of science and engineering postdoctorates generally was above the national average in Utah but below average in Arizona. Since then, each state has slipped relative to the national average. In 2013, Arizona was 55 percent, and Utah was 21 percent, below the U.S. average.

Advanced degrees in science and engineering are of particular importance to innovation. The second indicator is the number of employed individuals holding a doctorate in a science, engineering or health field, expressed on a per capita basis. Occasional data dating back to 1993 are available from the National Science Foundation. This indicator is subdivided into those working in a science/engineering occupation and those working in other jobs. Arizona's figures have been below both the national average and the Utah figures throughout, overall and in each

CHART 5
NUMBER OF GRADUATE STUDENTS AND POSTDOCTORATES IN SCIENCE AND ENGINEERING PER CAPITA, EXPRESSED AS A PERCENTAGE OF THE NATIONAL AVERAGE



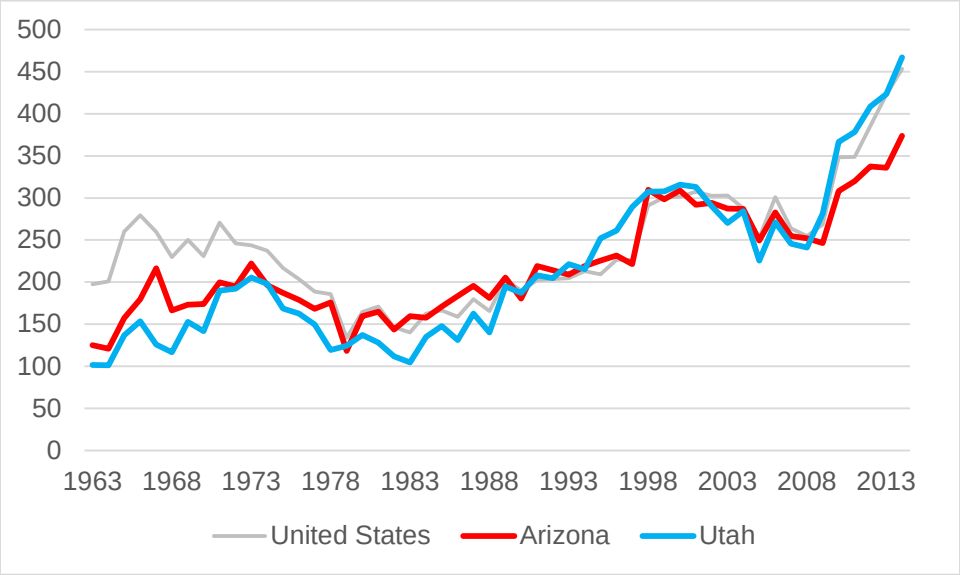
Source: National Science Foundation, https://ncsesdata.nsf.gov/webcaspar/.

of the subcategories. Utah's figures were greater than the U.S. average in the 1990s but have fallen to below average overall and among those working in science and engineering professions. Overall in 2013 relative to the national average, Arizona's figure was 34 percent less and Utah's figure was 2 percent less.

Inventive activity is a proxy for the quality of the innovation environment. The number of patents granted is one measure of a region's ability to innovate. The third indicator is the number of patents granted, expressed on a per capita basis. The U.S. Patent and Trademark Office has annual data dating back to 1963. Only "utility" patents, also known as "patents for inventions," with a United States origin are included. Arizona's figures were considerably less than the national average during the 1960s but rose to above average in most years from 1983 through 2000 (see Chart 6). Arizona's figures relative to the nation have fallen since then, with Arizona 18 percent below average in 2014. Utah's figures also were considerably less than the U.S. average in the 1960s, but rose to be similar to the average since 1989. The 2014 figure was 3 percent above average. Arizona's figures generally were higher than Utah's figures through 1988; the two states were similar from 1989 through 2008. Since then, Arizona has fallen relative to Utah; in 2014, Arizona's figure was 20 percent less.

Financial Capital. The importance of research and development (R&D) investment is a central theme of the economic literature on economic growth. Economic analysis suggests that R&D investment is crucial for attaining increases in labor productivity that ultimately translate into improvements in prosperity. The first financial capital indicator is the investment of the state's

CHART 6
NUMBER OF UTILITY PATENTS GRANTED PER 1 MILLION RESIDENTS



Source: U.S. Patent and Trademark Office, http://www.uspto.gov/web/offices/ac/ido/oeip/taf/reports.htm.

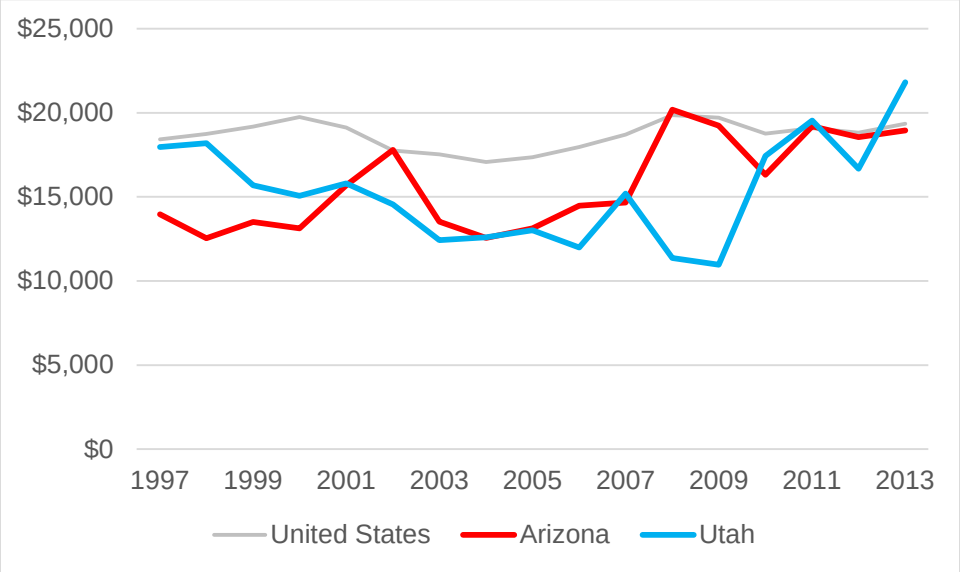
public universities and businesses in R&D, expressed relative to GDP. The National Science Foundation is the source. Annual data on industrial R&D goes back to 1975. Industrial R&D spending varies considerably by year. The figures for Arizona and Utah generally have been below the national average, with the comparison between the two states varying widely by year. In Chart 7, expenditures per $1 million of gross domestic product are displayed.

Annual data on academic R&D are available back to 1972. Academic R&D expenditures are considerably lower than industrial R&D. Overall, Arizona's academic R&D figures exceeded the national average from 1973 through 1996, but have been lower since, with a differential of 3 percent in 2013. Utah's figures were much greater than the national average during the 1970s and 1980s. The differential has narrowed, but Utah still was 31 percent higher in 2013. Arizona's per capita academic R&D spending has been considerably less than in Utah, with a differential of 26 percent in 2013.

Academic R&D is reported by source of the funding; the federal government and "institutions" — the universities themselves — are the major sources. On a per capita basis relative to Utah:

- Federal funding has been much less in Arizona; the differential was 37 percent in 2013.
- State and local government funding was higher in Arizona in some years through 1983, but has been much less since then; the differential was 46 percent in 2013.
- Industry funding has been variable, with Arizona's figure lower since 2008.
- Institutional funding generally was higher in Arizona from 1976 through 2008. Since then, the figures have been similar; Arizona was 1 percent higher in 2013.
- Other funding has been variable, with Arizona's figure higher since 2009.

CHART 7
INDUSTRY RESEARCH AND DEVELOPMENT EXPENDITURES PER $1 MILLION OF GROSS DOMESTIC PRODUCT



Source: National Science Foundation, Division of Science Resources Statistics, http://www.nsf.gov/statistics/industry/.

The second financial indicator uses data from the U.S. Small Business Administration (SBA), which administers two competitive programs to distribute federal research and development funds to small, high-technology businesses: Small Business Innovation Research (SBIR, since 1983) and Small Business Technology Transfer (STTR, since 1998). The SBIR program encourages small businesses to explore their technological potential and provides an incentive to profit from commercialization. The STTR is a related program that is designed to facilitate the transfer of technological innovation from nonprofit research institutions to small commercial enterprises. It primarily is a program linking research universities to commercialization efforts. Funding for SBIR is considerably greater than for STTR. Funding for both programs varies considerably by year at the state level.

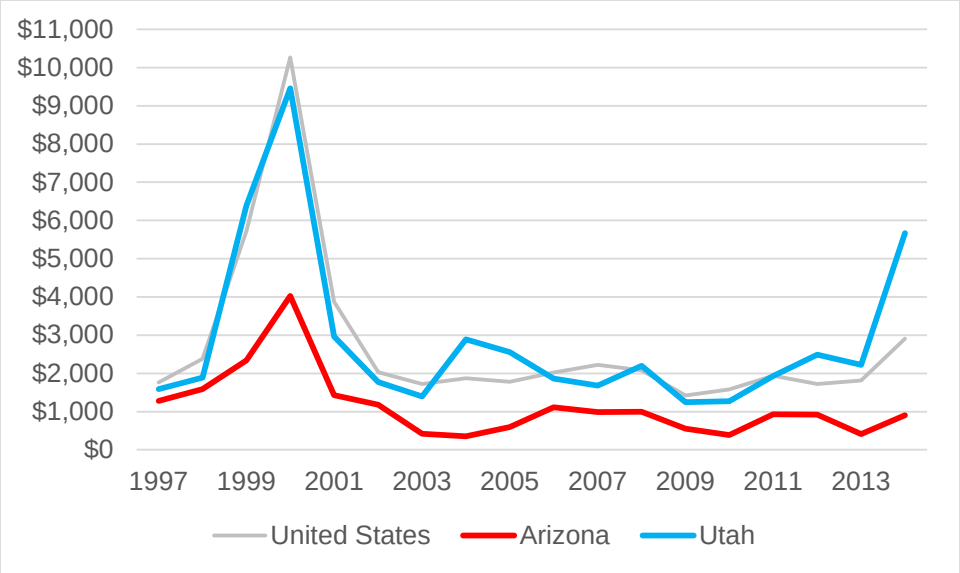
The innovation grant data can be measured in three ways: the number of grants per capita, the inflation-adjusted value of the grants per capita, and the value of the grants relative to gross domestic product. The latter measure is summarized here. The figure for SBIR grants in Arizona has varied from higher to lower than the U.S. average; in 2014, Arizona's figure was 18 percent higher. Utah's funding was far higher than the national average through the early 1990s but has since declined to below average in some years, though the 2014 figure was 24 percent higher. Funding for the STTR program has been especially variable, though Arizona and Utah have been higher than the national average in most years.

The third financial indicator is venture capital, obtained from the MoneyTree Report prepared by PricewaterhouseCoopers and the National Venture Capital Association. Venture capitalists invest in firms that have a high potential for growth but are not ready to do an initial public offering of stock. The investments tend to be both high risk and high return. Venture capital activity can be

used to measure the number of potentially high-growth firms being started. These typically are innovative high-technology firms, such as biotechnology enterprises.

Venture capital can be measured in the same three ways as innovation grants; the value relative to GDP is summarized here. Annual data are available for 1995 through 2014. Venture capital relative to GDP has been far lower in Arizona than the national average; the differential was 69 percent in 2014. By year, Utah's figure has varied from higher to lower than the U.S. average, but was higher in each year from 2012 through 2014, including a 95 percent difference in 2014 (see Chart 8).

CHART 8
VENTURE CAPITAL GRANTED
PER $1 MILLION OF GROSS DOMESTIC PRODUCT



Source: PricewaterhouseCoopers and National Venture Capital Association, MoneyTree(tm) Report, http://www.pwcmoneytree.com/.

ECONOMIC PROFILE

The employment-to-population ratio is a simple indicator that provides some insight into prosperity since the ratio is correlated to per capita income. The ratio fluctuates with the economic cycle; it peaked in 2007 and was lowest in 2010. Using BEA data for 2009 through 2013, a period including the end of an economic recession and a slow recovery, the ratio nationally averaged 56.8. The ratio was higher in Utah at 59.2 and lower in Arizona at only 50.8.

Since the employment-to-population ratio includes children and people of retirement age, a better measure is to calculate the ratio based only on the working-age population. Using ACS data for 2009 through 2013, the employment-to-population ratios for various age groups are shown in Table 9. The results are consistent with those from the BEA data. Regardless of the age group selected, the employment-to-population ratio was lower in Arizona and higher in Utah than the national average.

Among men, the employment-to-population ratio in Utah was higher than the national average in all age groups and substantially higher among those less than 70 years of age. In contrast, the employment-to-population ratio among men in Arizona was less than the national average in each age group except those 21 and younger. Arizona's employment ratios among men were far below those in Utah. Among women, the employment-to-population ratio also was higher overall in Utah than the U.S. average, but the ratio in Utah was considerably lower than average among those in the prime child-rearing ages of 25 through 44. In Arizona, the employment-to-population ratio among females was lower than the national figure in all age groups. Arizona's employment ratios for women were higher than in Utah only among those 25-to-44 years of age.

Composition of Economy

Most commonly, economic activity is categorized by the North American Industry Classification System (NAICS), in which the total is divided first into 20 sectors, then progressively into subsectors, industry groups, and industries. Except for the nation, the more detailed data frequently are withheld due to the federal disclosure laws. Because of the switch from the old Standard Industrial Classification (SIC) to the NAICS, a long time series of industrial data is not available.

Sectoral data are available from several sources and for various economic measures. The most commonly used at the state level are the annual GDP estimates produced by the BEA and the

TABLE 9
EMPLOYMENT-TO-POPULATION RATIO, 2009-13 AVERAGE

	Total			Male			Female		
Age Group	United States	Ari-zona	Utah	United States	Ari-zona	Utah	United States	Ari-zona	Utah
16 and Older	58.1%	54.4%	63.4%	62.7%	58.8%	71.0%	53.7%	50.1%	55.8%
20 to 64	70.5	67.4	73.8	74.7	72.0	82.1	66.4	62.9	65.3
25 to 64	71.6	68.2	74.0	76.4	73.3	83.3	66.9	63.2	64.4
25 to 54	75.1	72.0	76.2	79.9	77.0	86.0	70.3	66.8	66.1

Source: U.S. Department of Commerce, Census Bureau, American Community Survey, Table B23001, http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml.

monthly employment estimates produced by the U.S. Department of Labor's Bureau of Labor Statistics (BLS). The monthly employment figures are particularly useful due to their timeliness. However, the estimates are subject to sampling error and only cover a subset of wage and salary workers. The BEA annually reports total employment, but the data are not released until nine months after the end of a year.

Economic activity also can be categorized by the Standard Occupational Classification (SOC), in which the total is divided into 22 major groups and subdivided into 840 occupations. Like the industrial data, the more detailed occupational data frequently are withheld for states.

Occupational employment and wage estimates are reported annually for states by the BLS through its occupational employment statistics program (http://stats.bls.gov/oes/). This program surveys employers; the results are subject to survey error. Though data are reported annually, the data are not designed to be used as a time series. Among the limitations for use as a time series is that the survey cycle runs over six semiannual periods (the survey is done in May and November). Thus, two-thirds of the sample is the same in two consecutive years. The latest available data include the May 2014 survey.

Sectors

The GDP and total employment figures from the BEA are summarized in Table 10 by sector. Relative to GDP, the sectoral shares are considerably different as measured by employment, since some sectors are labor intensive while others are capital intensive with high earnings.

Arizona's sectoral mix in 2013/2014 varied from the national average primarily in the relatively small size of the manufacturing sector. This was offset largely by the relatively large size of the administrative and waste management services sector and the real estate and rental sector. The sectoral share of retail trade also was above average, especially as measured by GDP. The professional, scientific and technical services sector was relatively small, especially as measured by GDP.

Utah's sectoral mix differed from the national average primarily by having a relatively large finance and insurance sector and a relatively small health care and social assistance sector. The construction sector also was relatively large, especially as measured by GDP.

The comparison of the sectoral mix in Arizona and Utah displays more numerous variations than between each state and the national average. Sectoral shares in several services sectors — particularly real estate and rental, administrative and waste management services, and health care and social assistance — were higher in Arizona than in Utah; the accommodation and food services sector also was larger in Arizona. The manufacturing sector's share was considerably greater in Utah than in Arizona. Also larger in Utah were the information; finance and insurance; and professional, scientific and technical services sectors.

Subsectoral data from the BEA (for 2013 for GDP) allow a closer look at the differences in industrial composition between the two states. The larger sectoral share in Arizona in the real estate and rental sector resulted almost entirely from the real estate subsector. Similarly, the administrative and support services subsector accounted for nearly all of the differential in the

TABLE 10
GROSS DOMESTIC PRODUCT AND EMPLOYMENT BY INDUSTRIAL SECTOR

	Gross Domestic Product, 2014			Employment, 2013		
	United States	Arizona	Utah	United States	Arizona	Utah
	Billions of Dollars			Number of Employees		
TOTAL	$17,316	$284.2	$141.4	182,278	3,392	1,743
	Share of Total			Share of Total		
Agriculture	1.21%	0.78%	0.57%	1.94%	1.30%	1.30%
Mining	2.66	2.14	3.11	0.88	0.71	1.09
Utilities	1.68	1.98	0.88	0.32	0.36	0.24
Construction	3.77	4.48	5.17	5.08	5.17	5.71
Manufacturing	12.07	8.37	12.36	6.99	4.96	7.30
Wholesale Trade	5.99	5.61	5.09	3.48	3.27	3.13
Retail Trade	5.86	7.81	6.88	10.08	10.70	10.61
Transportation & Warehousing	2.92	2.96	3.37	3.29	2.88	3.22
Information	4.67	2.78	4.08	1.79	1.55	2.17
Finance and Insurance	7.28	7.32	8.61	5.42	6.32	6.83
Real estate and Rental	13.08	14.60	12.81	4.38	6.52	5.05
Professional & Technical Services	7.05	5.55	6.30	6.83	6.21	6.98
Management of Companies	1.99	1.38	1.54	1.24	0.99	1.35
Administrative & Waste Services	3.08	4.49	2.96	6.21	8.17	5.76
Educational Services	1.10	1.15	1.31	2.32	2.11	3.00
Health Care & Social Assistance	7.19	8.19	5.65	11.29	10.83	8.56
Arts, Entertainment & Recreation	1.01	1.05	0.83	2.26	2.15	2.20
Accommodation & Food Services	2.79	3.40	2.49	7.18	7.55	6.37
Other Services	2.22	2.17	2.94	5.82	5.22	5.18
Government	12.36	13.80	13.04	13.19	13.02	13.95

Source: U.S. Department of Commerce, Bureau of Economic Analysis, http://www.bea.gov/regional/index.htm.

administrative services and waste management sector. Most of the larger share in Arizona in the health care and social assistance sector was in the ambulatory services subsector. The food services subsector accounted for most of the difference in the accommodation and food services sector.

For those sectors with a greater sectoral share in Utah than Arizona, subsectoral results were inconsistent between the GDP and employment measures in the information and finance and insurance subsectors; limited subsectoral detail was available in the professional, scientific and technical services sector. In the manufacturing sector, estimates are available for 19 subsectors. The only two that had a larger share in Arizona were the computer and electronics equipment subsector and the other transportation equipment subsector, which includes aerospace.

A measure of job quality can be calculated either at the sectoral level or at the subsectoral level, with the more detailed data providing a more precise estimate. Job quality is expressed relative to the national average, calculated by summing over all sectors or subsectors (the difference in the share of employment between the state and the nation) times (the ratio of the national sectoral or subsectoral average compensation to the overall national average compensation minus 1) times 100.

Arizona's industrial job quality is less than the national average while job quality in Utah is better than the national average. At the sectoral level, Arizona's job quality in 2013 was -3.4, compared to 1.8 in Utah. Using subsectoral data, the figures were -1.9 in Arizona and 2.2 in Utah.

Occupational Groups

In most occupational groups, the shares of total employment in Arizona and Utah in 2014 were not much different from the national average. Arizona had significantly lesser shares in the production occupational group and in the transportation and material moving group, offset by higher shares in the office and administrative support, sales and related, and protective service occupational groups. Utah had lesser shares in the food preparation and serving group and in the healthcare practitioners and technical group, with greater shares in the office and administrative support group and in the construction and extraction group (see Table 11).

TABLE 11
EMPLOYMENT AND WAGES BY OCCUPATIONAL GROUP, 2014

	Employment			Median Wage*	
	United States	Arizona	Utah	Arizona	Utah
	Number in Thousands				
TOTAL	135,128	2,527	1,281	96.3%	94.8%
	Share of Total				
Management	4.99%	5.01%	5.22%	90.1	83.5
Business and Financial Operations	5.05	5.08	5.05	91.2	89.0
Computer and Mathematical	2.84	3.26	3.00	93.9	88.5
Architecture and Engineering	1.79	2.01	2.09	94.5	91.6
Life, Physical, and Social Science	0.85	0.70	0.82	88.7	85.5
Community and Social Service	1.43	1.55	1.33	92.6	88.8
Legal	0.78	0.73	0.67	90.3	87.1
Education, Training, and Library	6.24	5.55	6.11	82.9	92.2
Arts, Design, Entertainment, Sports, Media	1.33	1.22	1.43	83.4	83.1
Healthcare Practitioners and Technical	5.81	5.49	4.76	105.5	93.9
Healthcare Support	2.92	2.59	2.54	108.9	97.0
Protective Service	2.44	3.15	1.79	107.2	97.3
Food Preparation and Serving Related	9.09	9.53	7.78	99.5	99.0
Building & Grounds Cleaning & Maint.	3.24	3.09	3.19	92.7	88.7
Personal Care and Service	3.07	3.31	2.48	99.7	99.6
Sales and Related	10.54	11.43	10.85	98.6	100.5
Office and Administrative Support	16.01	17.49	18.03	98.2	91.2
Farming, Fishing, and Forestry	0.33	0.53	0.10	91.4	115.6
Construction and Extraction	3.91	4.32	5.76	90.9	90.9
Installation, Maintenance, and Repair	3.88	4.03	3.94	97.2	101.6
Production	6.61	4.22	6.85	98.4	99.2
Transportation and Material Moving	6.84	5.70	6.21	99.3	105.9

* Expressed as a percentage of the national average.

Source: U.S. Department of Labor, Bureau of Labor Statistics, occupational employment statistics program, http://stats.bls.gov/oes/.

Since compensation data (benefits plus wages) are not available from the occupational dataset, average wage is used instead in the calculation of job quality. Arizona's occupational job quality is marginally better than the national average while job quality in Utah is better than in Arizona. At the occupational group level, Arizona's job quality in 2014 was 0.2, compared to 0.7 in Utah. Using occupational data, the figures were 0.6 in Arizona and 1.0 in Utah.

The overall median hourly wage in the occupational dataset in Arizona in 2014 was $16.46 — 3.7 percent less than the U.S. average of $17.09. Arizona's figure was 0.8 percent below average after adjusting by the 2013 regional price parity. Utah's median hourly wage of $16.20 was 5.2 percent below average (2.5 percent below average after adjustment for the cost of living).

In Arizona, the median wage was particularly far below the national average in most of the professional occupational groups, including a differential of 17 percent in the education, training and library group. In contrast, the median wage was higher than the U.S. average in the healthcare practitioners and technical, healthcare support, and protective service groups.

In Utah, the median wage also was particularly far below average in the professional occupational groups, including a differential of 17 percent in the management group. The median was higher than the national average in the farming, fishing and forestry group and in the transportation and material moving group, and marginally higher in the sales and related group and in the installation, maintenance and repair group.

High Technology

High-technology activities can be classified by occupation or by industry.

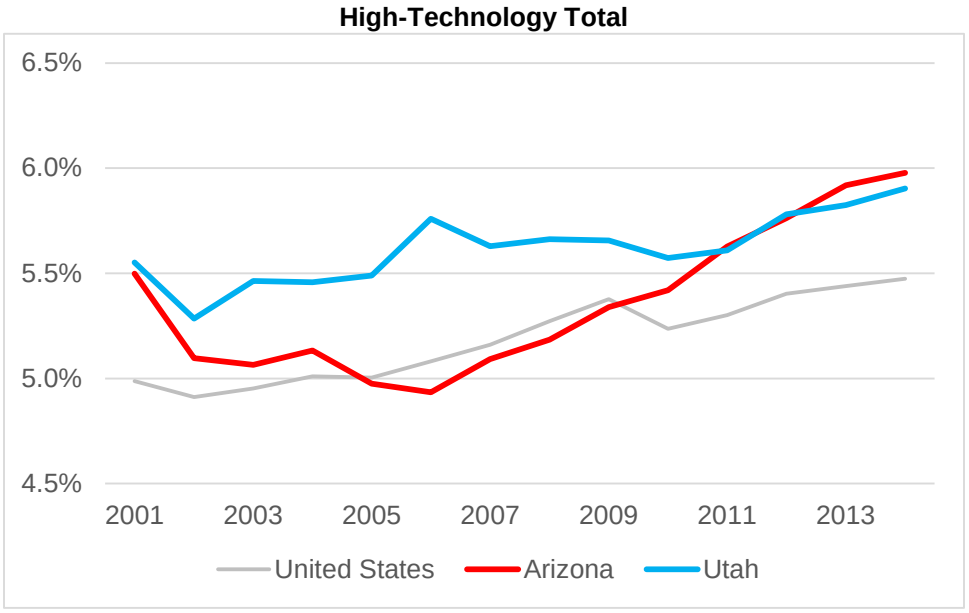
Occupations

In this paper, high-technology is defined as the combination of three occupational groups — computer and mathematical; architecture and engineering; and life, physical, and social sciences. In Chart 9, high-technology employment as a share of total employment is shown for each year from 2001 through 2014 — though the data were not designed to be used on a time-series basis. The overall high-tech share has consistently been higher in Utah than the nation, while the share in Arizona was below average in 2006, 2007 and 2008.

In the computer and mathematical occupational group, the share in Utah has consistently been higher than the nation; Arizona's share was below average from 2002 through 2010. The architecture and engineering share has been consistently higher in Arizona than the nation, though the size of the differential has narrowed in recent years. Utah's share has been a little higher than the nation since 2006. In the life, physical, and social sciences group, the share in Utah was higher than the nation before 2009, but has been essentially equal to the average since 2009. Arizona's share has been less than the nation.

The median wage in each of the three high-technology occupational groups was substantially higher than the median wage of all occupations in 2014, in Arizona, Utah, and the nation (see Chart 10). In each category, the median wage in Arizona was less than the national figure, with Utah's figure slightly less than in Arizona. The difference from the national average in each of the three high-tech occupational groups was greater than the overall difference in both Arizona

CHART 9
HIGH-TECHNOLOGY EMPLOYMENT DEFINED BY OCCUPATIONAL GROUP AS A SHARE OF TOTAL EMPLOYMENT



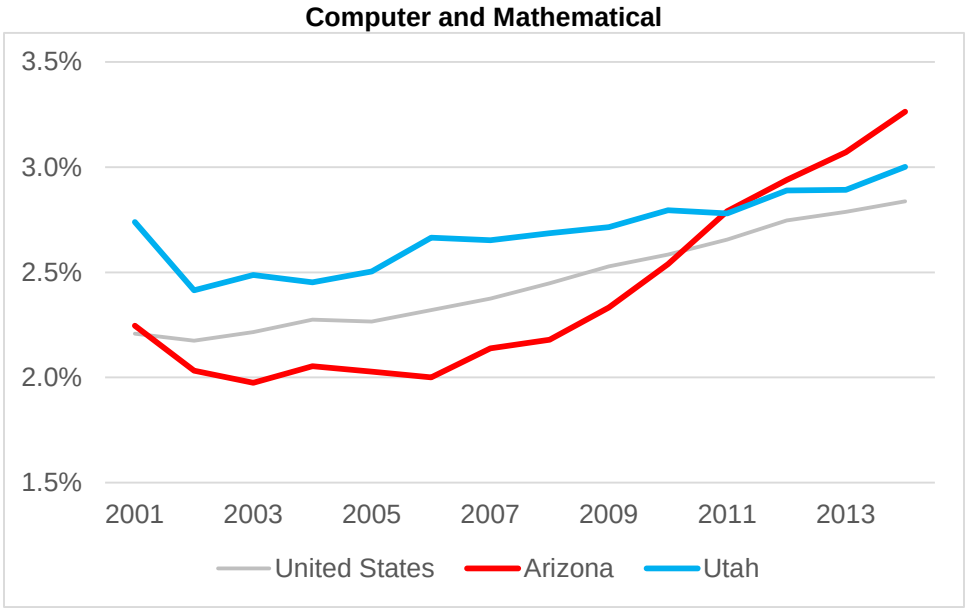


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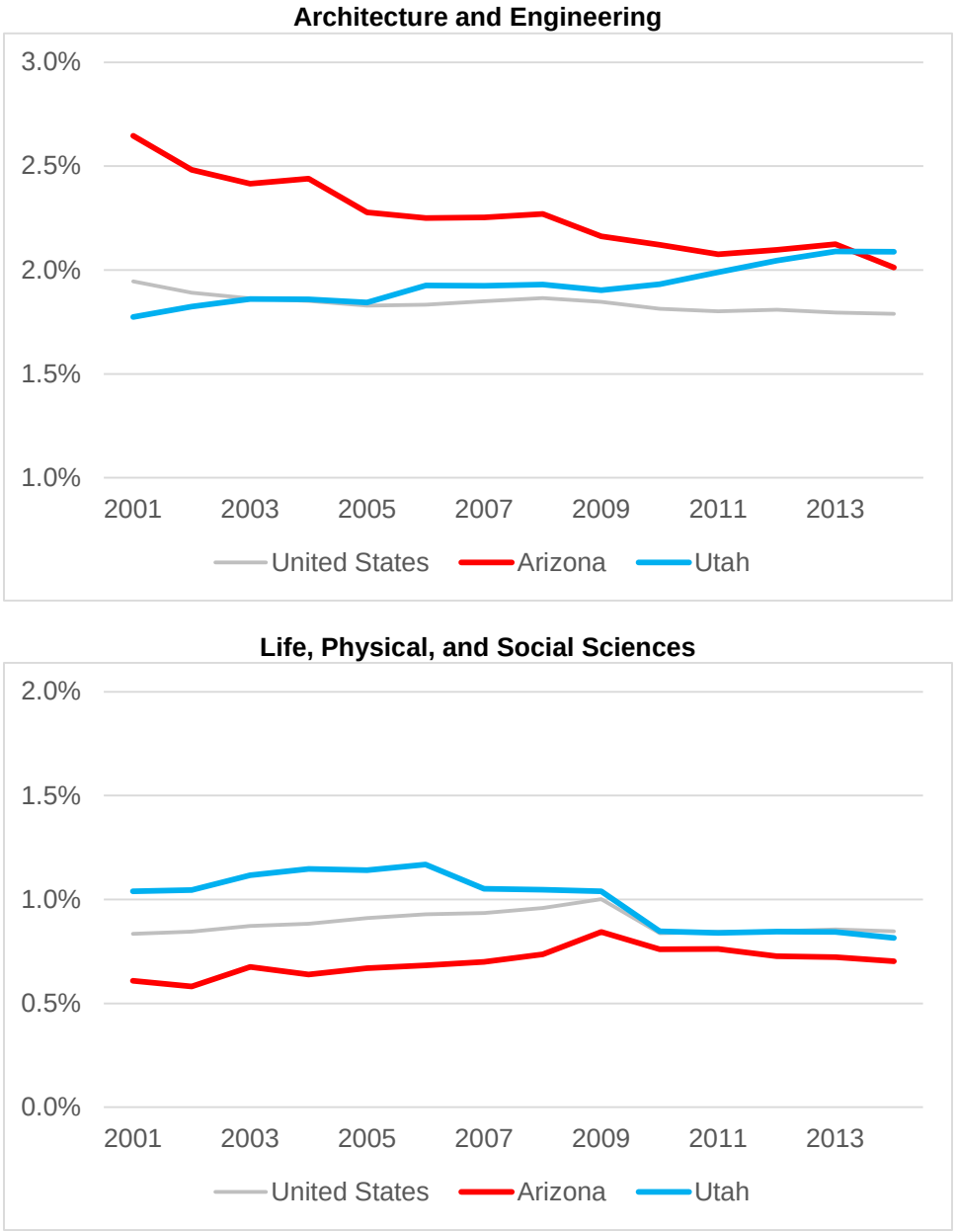
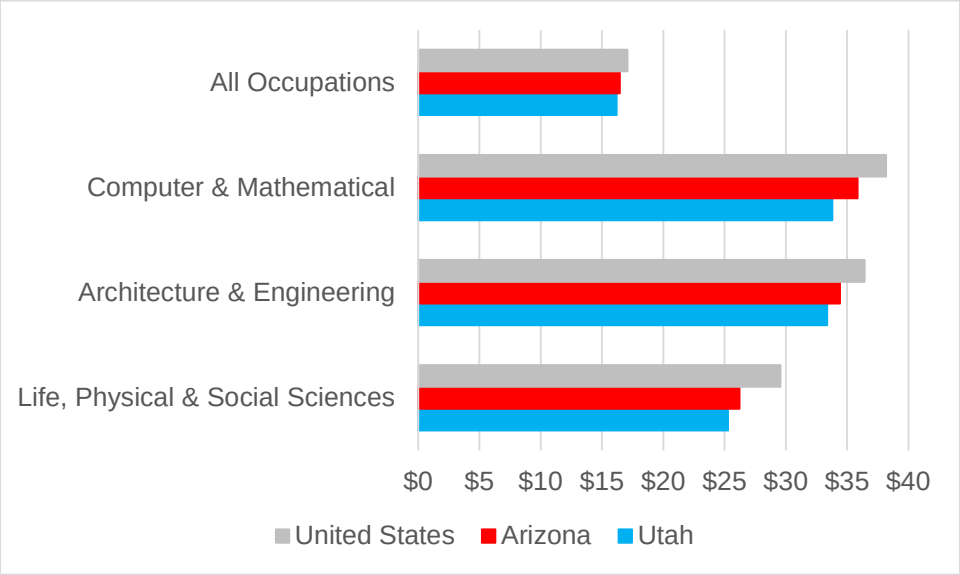
CHART 9 (continued)
HIGH-TECHNOLOGY EMPLOYMENT DEFINED BY OCCUPATIONAL GROUP AS A SHARE OF TOTAL EMPLOYMENT



Note: Though shown as lines to ease comparisons, the occupational data were not designed to be used on a time-series basis.

Source: U.S. Department of Labor, Bureau of Labor Statistics, occupational employment statistics program, http://stats.bls.gov/oes/.

CHART 10
MEDIAN HOURLY WAGE IN 2014 BY OCCUPATIONAL GROUP



Source: U.S. Department of Labor, Bureau of Labor Statistics, occupational employment statistics program, http://stats.bls.gov/oes/.

and Utah. This suggests that while high tech as defined by occupation in 2014 accounted for a higher share of total employment in Arizona and Utah than the nation, the high-tech job mix in these states is tilted toward occupations that pay lower wages.

The below-average cost of living in Arizona and Utah contribute to the below-average high-tech wages. However, even after adjustment for living costs, the medians were less than the national figure in each of the high-tech occupational groups:

- Computer and mathematical: 3 percent in Arizona, 9 percent in Utah.
- Architecture and engineering: 3 percent in Arizona, 6 percent in Utah.
- Life, physical, and social sciences: 9 percent in Arizona, 12 percent in Utah.

Industries

The industrial definition of high technology used in this report is based on definitions created by the U.S. Bureau of Labor Statistics, the American Electronics Association, and Carnegie Mellon University. Most of the 17 components are industry groups — a four-digit NAICS code shown in parentheses in the following list — but a few are subsectors or industries:

- High-technology manufacturing activities:
  - pharmaceutical and medicine (3254)
  - optical instruments and lenses (333314)
  - computer and peripheral equipment (3341)
  - communications equipment (3342)
  - audio and video equipment (3343)
  - semiconductor and other electronic components (3344)
  - navigational, measuring, electromedical, and control instruments (3345)

    - aerospace products and parts (3364)
- High-technology service activities:
    - commercial equipment merchant wholesalers (4234)
    - software publishers (5112)
    - telecommunications (517)
    - data processing, hosting, and related (5182)
    - Internet publishing and broadcasting and web search portals (51913)
    - engineering services (54133)
    - testing laboratories (54138)
    - computer systems design and related (5415)
    - scientific research and development (5417)

The annual County Business Patterns dataset produced by the U.S. Department of Commerce's Census Bureau (http://www.census.gov/econ/cbp/) was used to obtain employment estimates by year from 1998 through 2013; the figures can be analyzed on a time series basis. The annual employment figure is as of the week of March 12 and includes part-time as well as full-time employees. Certain activities, most notably farms and government, are not included in the dataset. For Arizona and Utah, employment figures for some components of the high-technology measure had to be estimated in some years due to the data being withheld by the federal government.

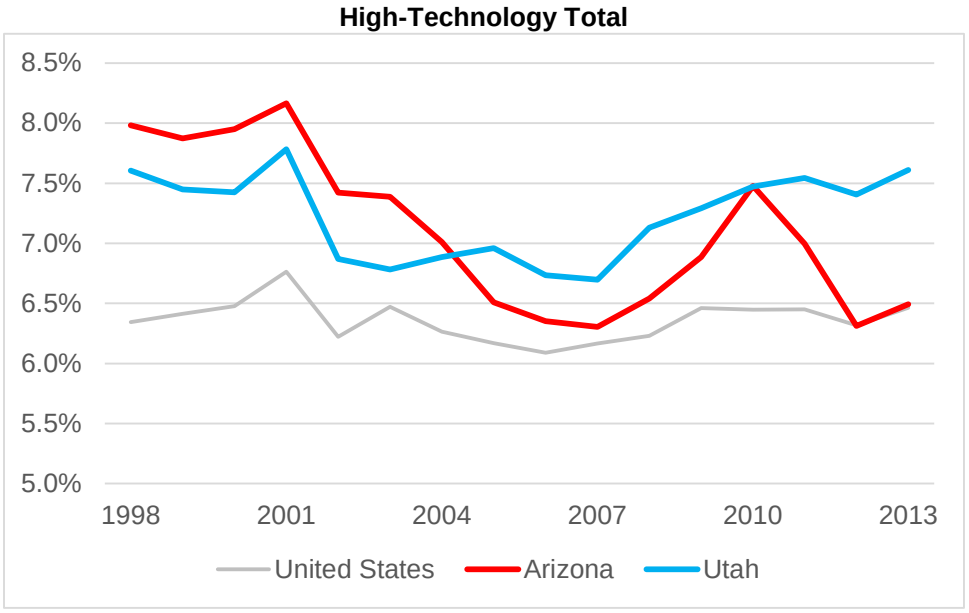
In Chart 11, high-technology employment as a share of the total is shown for the nation, Arizona, and Utah. Utah's high-tech share was higher than the national average throughout the 1998-to-2013 period. In contrast, Arizona's share historically was higher than in Utah and the nation, but by 2013 was considerably less than in Utah and about equal to the national average.

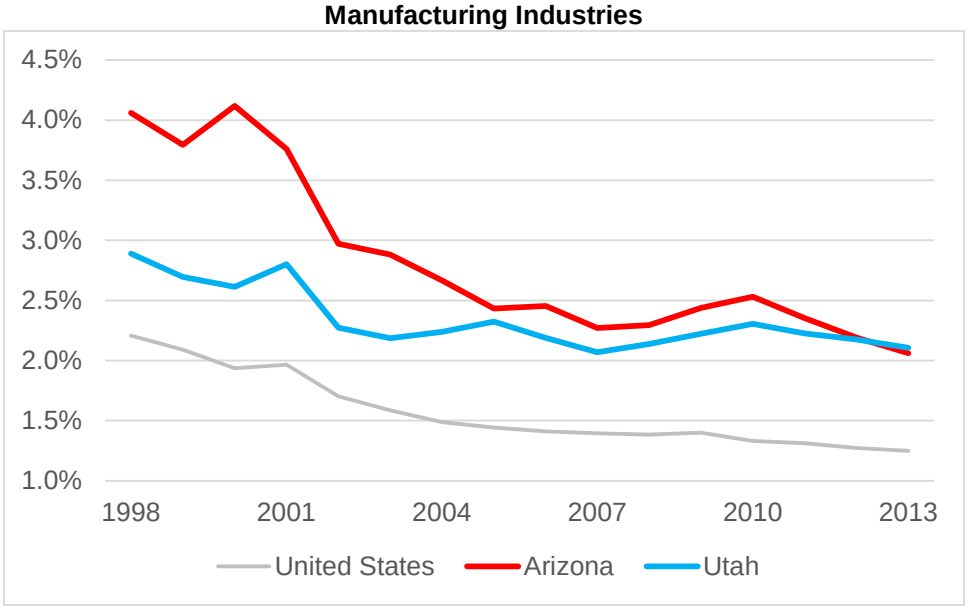
Arizona's greater high-tech share historically and its decline over time relative to Utah and the nation is due to the manufacturing components. By 2012, Arizona's manufacturing share was not higher than in Utah, though still higher than the national average. In the services components, Utah's share was close to the nation throughout the time series, while Arizona's share was lower.

Relative to Utah, Arizona's higher historical share, and its decline over time, in high-tech manufacturing primarily resulted from the semiconductor and other electronic components industry group. By 2013, the share in this component was the same in the two states. Arizona's share in the aerospace products and parts industry group continued to be higher than in Utah in 2013. In the pharmaceutical and medicine industry group and in the navigational, measuring, electromedical, and control instruments industry group, the shares in Utah were higher than in Arizona.

In the services components, the higher share in Utah than in Arizona has primarily been in activities related to computers, particularly software publishers. Engineering services was the only services industry with a higher share in Arizona in 2013.

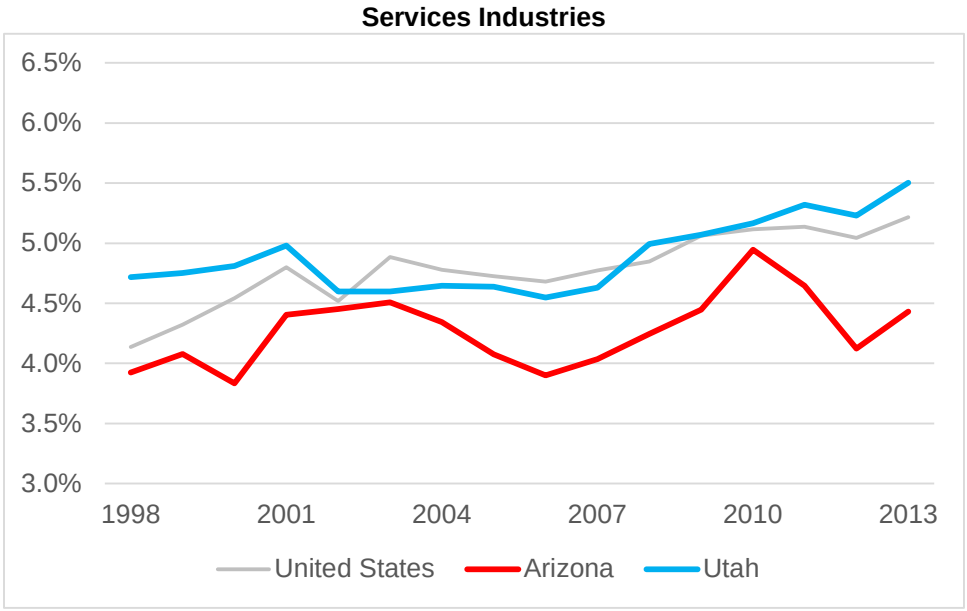
CHART 11
HIGH-TECHNOLOGY EMPLOYMENT DEFINED BY INDUSTRY
AS A SHARE OF TOTAL NONFARM, PRIVATE-SECTOR EMPLOYMENT





(continued)

CHART 11 (continued)
HIGH-TECHNOLOGY EMPLOYMENT DEFINED BY INDUSTRY
AS A SHARE OF TOTAL NONFARM, PRIVATE-SECTOR EMPLOYMENT



Source: U.S. Department of Commerce, Census Bureau, County Business Patterns, http://www.census.gov/econ/cbp/.

Imports and Exports

In a state, the exporting of goods produced in the state to customers in other states or nations is an important economic driver, bringing money into the economy. Similarly, importing goods produced in other states or countries causes money to leave the state. International imports and exports and interstate exports and imports have a comparable impact on a state's economy, but data are available only for international imports and exports — from the U.S. Department of Commerce, Census Bureau. The importing/exporting of services has an economic effect comparable to that of goods, but no services data are available by state.

Import data by state are divided between manufactured goods and other goods, such as agricultural and mining commodities. The import data by state are available only back to 2008 and should be considered to be only rough estimates since the value of imports cannot always be assigned by state. If a shipment is destined for multiple states, all of the shipment is assigned to the state with the greatest value. If the destination is unknown, the value is assigned to the state of the ultimate consignee or the state where the entry is filed.

Imports of both manufactured goods and of other commodities as a percentage of GDP have been considerably lower in Arizona and Utah than the national average. Relative to Utah, Arizona's figures have been lower for manufactured items, the primary category, but higher for other commodities. In 2014, Arizona's overall import figure relative to GDP was 12 percent less than Utah's figure.

Exports by state are divided between manufactured goods, other goods (such as agricultural and mining commodities), and “re-exports.” Commodities imported into the United States that are processed in the United States and then exported are placed in the re-export category. The export data by state are available back to 1996. The export data are more accurate than the import data, but do not necessarily reflect commodities manufactured, grown or mined in a state. Instead, the export data reflect the transportation origin—the state from which merchandise begins its journey to the port of export. If shipments are consolidated, the consolidated shipment is assigned to the state where the consolidation occurred.

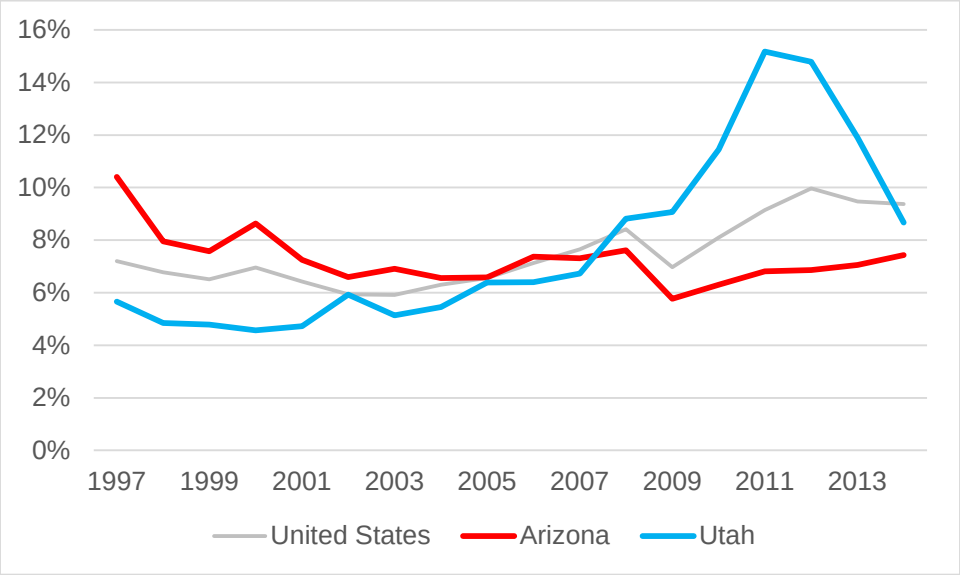
Total exports as a percentage of GDP were higher in Arizona than the national average from 1996 through 2006, but were 21 percent below average in 2014. Arizona’s figures generally have been above average in the re-export category and were higher in the other commodities category from 2012 through 2014. In the largest category of manufactured goods, Arizona’s figure was above average from 1997 through 2004 but was 36 percent below average in 2014.

Total exports as a percentage of GDP were higher in Utah than the national average from 2008 through 2013, but were 7 percent below average in 2014 (see Chart 12). A single commodity — nonmonetary unwrought gold — caused the surge in exports and the subsequent decline; it accounted for more than 60 percent of the state’s total export value in 2011 and 2012 and despite a large drop in value, it still accounted for 31 percent of the total in 2014.

Utah’s exports as a share of GDP generally has been below average in the other commodities category and much below average in the re-export category. Manufactured goods generally have been above average since 2002, with a differential of 8 percent in 2014.

Relative to Utah, Arizona’s exports as a share of GDP have been much higher in the re-export category and generally higher in the other commodities category. Arizona also was higher for manufactured goods from 1996 through 2004, but was 41 percent lower in this category in 2014. The total in Arizona was higher from 1996 through 2007, but was 14 percent less in 2014.

CHART 12
INTERNATIONAL EXPORTS AS A SHARE OF GROSS DOMESTIC PRODUCT



Source: U.S. Department of Commerce, Census Bureau, http://www.census.gov/foreign-trade/statistics/state/index.html (exports) and U.S. Department of Commerce, Bureau of Economic Analysis, http://www.bea.gov/regional/index.htm (gross domestic product).

ECONOMIC PERFORMANCE

Measures of aggregate economic growth, such as GDP and employment, often receive the greatest attention, but the ultimate goal of economic development is to enhance the prosperity of an area, not to increase the area's economic size. In order to achieve gains in prosperity, increases in productivity must be realized. Thus, measures of productivity, such as GDP per employee, and measures of prosperity, such as GDP per capita, are examined first in this section, followed by aggregate economic measures.

Productivity and Prosperity

At a regional level, there is no true measure of productivity. Measures such as GDP per worker and earnings per worker are used as proxies. A common worldwide measure of prosperity is gross domestic product per capita. In the United States, per capita personal income also is commonly used. Various other measures provide additional insight into prosperity.

Proxy Measures of Productivity

The time series of these measures are limited to the 1969-to-2013 period since these are the only years for which total employment figures are available from the BEA. GDP per worker has been consistently higher in Arizona than Utah, as shown in Chart 13. The differential in 2013 was 4.6 percent. GDP per worker has been less than the national average in each state since the 1970s. Arizona's ratio relative to the nation has trended down since 1969. Utah's ratio versus the nation dropped significantly in the late 1980s, but has trended up slightly since then. Versus the U.S. average, GDP per worker in 2013 in Arizona was 11.4 percent, and Utah 15.3 percent, less. Since 1994, Arizona has lost ground relative to both the nation and Utah.

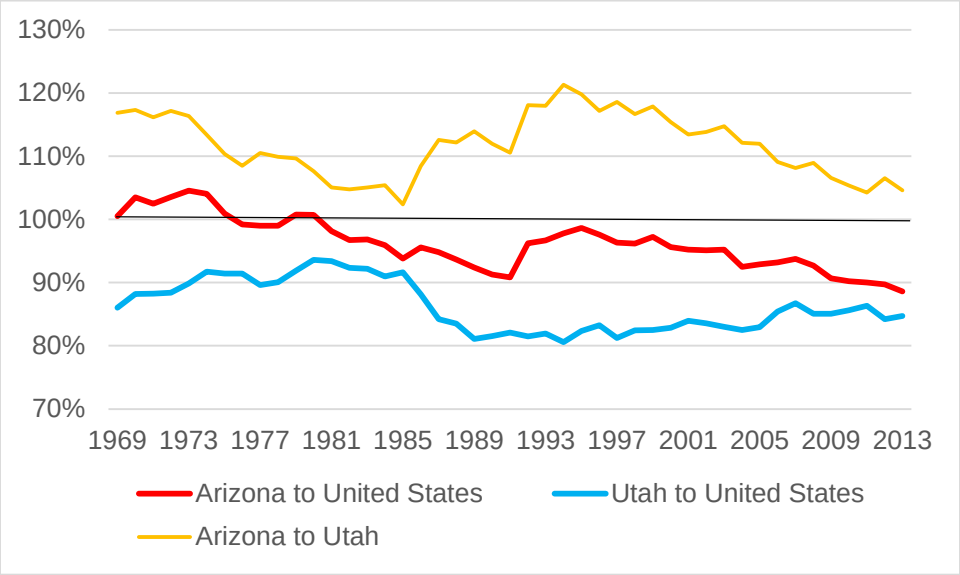
The comparisons are somewhat different on the measure of earnings per worker, though Arizona also has been consistently higher than Utah on this measure, as shown in Chart 14. The differential in 2013 was 6.4 percent. Earnings per worker has been less than the national average in each state since 1969, with each state falling relative to the nation during the 1980s. In 2013, Arizona was 10.4 percent, and Utah 15.8 percent, less than the U.S. average. Arizona has lost ground relative to both the nation and Utah since the mid-2000s.

Earnings per worker can be divided into two components: income per proprietor and earnings per wage and salary employee. Earnings of wage and salary employees in turn can be divided into wages and supplements to wages. Supplements (benefits) include employer contributions to social security, retirement plans, health insurance, life insurance, workers' compensation, unemployment benefits, etc.

Earnings per wage and salary employee in 2013 was below the national average by 7.5 percent in Arizona and 13.3 percent in Utah. Historically, the figures in each state relative to the nation have fluctuated but not shown a trend.

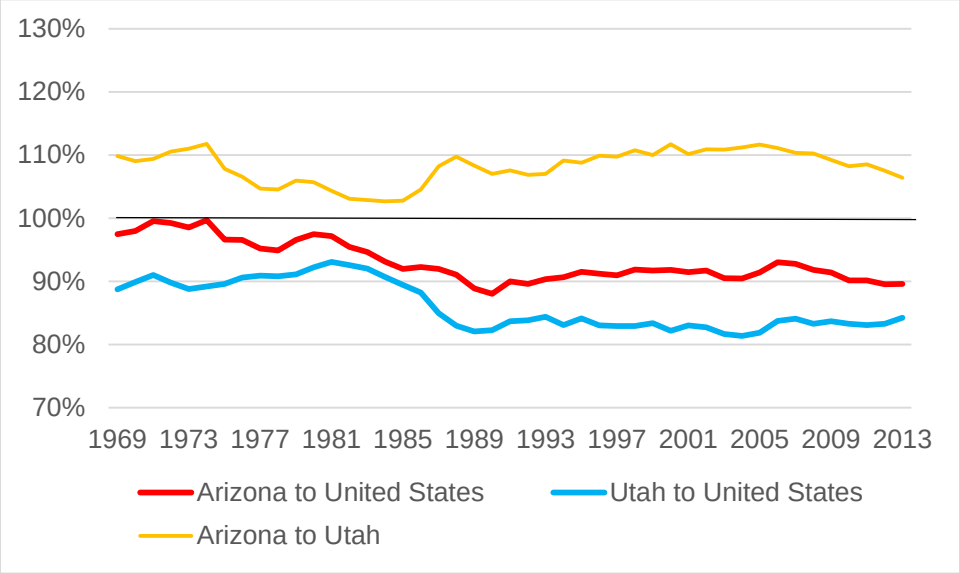
Relative to the nation in 2013, the average wage in Arizona was 6.4 percent below average and the average benefit (supplement to wages) was 12.1 percent below average. The average wage in Utah was lower than in Arizona at 14.6 percent below the U.S. average, but the average benefit in Utah was higher than in Arizona at 7.8 percent below average.

CHART 13
GROSS DOMESTIC PRODUCT PER WORKER RATIOS



Source: U.S. Department of Commerce, Bureau of Economic Analysis, http://www.bea.gov/regional/index.htm.

CHART 14
EARNINGS PER WORKER RATIOS



Source: U.S. Department of Commerce, Bureau of Economic Analysis, http://www.bea.gov/regional/index.htm.

Nationally, average proprietors' income in 2013 was 46 percent less than earnings per wage and salary employee. Income per proprietor in 2013 was below the national average by 25.7 percent in Arizona and 28.7 percent in Utah. Relative to the nation, average proprietors' income fell considerably in each state during the 1970s and 1980s. Following a partial recovery in the 1990s, each state has fallen further relative to the nation.

Measures of Prosperity

Estimates of personal income and population extend from 1929 through 2014. During this period, per capita personal income in Arizona generally has been higher than in Utah, as seen in Chart 15. Utah's figures are adversely affected by the state's high birth rate and large number of persons per household. The differential between the two states has varied; since 1987, it has trended down. Arizona's PCPI was only 0.3 percent higher in 2014. Except for one year during World War II, the figure in each state has been less than the national average. Arizona's ratio to the nation has trended down since 1971. In contrast, Utah dropped relative to the nation from 1963 through 1989, but has partially recovered the relative losses since then. In 2014 relative to the U.S. average, PCPI was 17.9 percent lower in Arizona and 18.1 percent less in Utah.

Personal income consists of three categories: earnings by place of residence; dividends, interest and rent; and transfer payments. The latter category includes social security and unemployment insurance payments. The similarity in PCPI in Arizona and Utah in 2014 results from differing relationships by category:

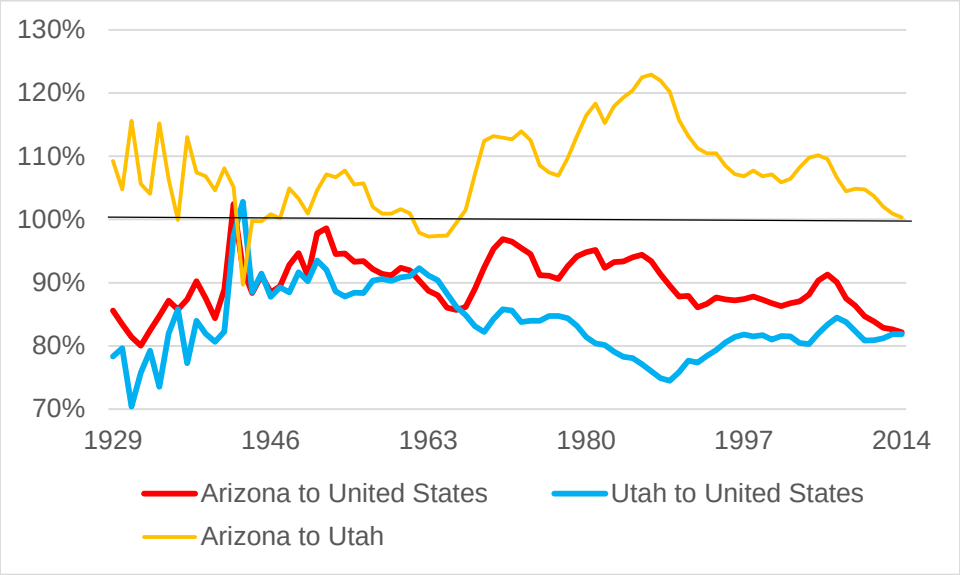
- Per capita earnings was higher in Utah than in Arizona.
- Per capita dividends, interest and rent was slightly higher in Arizona than in Utah.
- Per capita transfer payments was much higher in Arizona than in Utah.

Relative to the national per capita average, Arizona was 21.4 percent lower on earnings, 19.8 percent lower on dividends, interest and rent, and only 2.5 percent lower on transfers. The comparable figures for Utah were 12.5 percent less on earnings, 21.6 percent lower on dividends, interest and rent, and 35.4 percent lower on transfers. Arizona has lost ground to both the nation and Utah since the 1950s on the earnings measure and since the 1980s on the dividends, interest and rent measure.

The earliest estimate of GDP by state dates to 1963; the first inflation-adjusted figures are for 1987. Comparisons are different on the broader measure of GDP per capita than on PCPI. As a ratio to the United States, Arizona's GDP per capita figure has cycled from higher to lower than the PCPI ratio; in recent years, the GDP ratio has been lower. In contrast, except for 1966 through 1972, Utah's ratio to the nation has been higher based on GDP per capita than on PCPI, with a large differential since 2000.

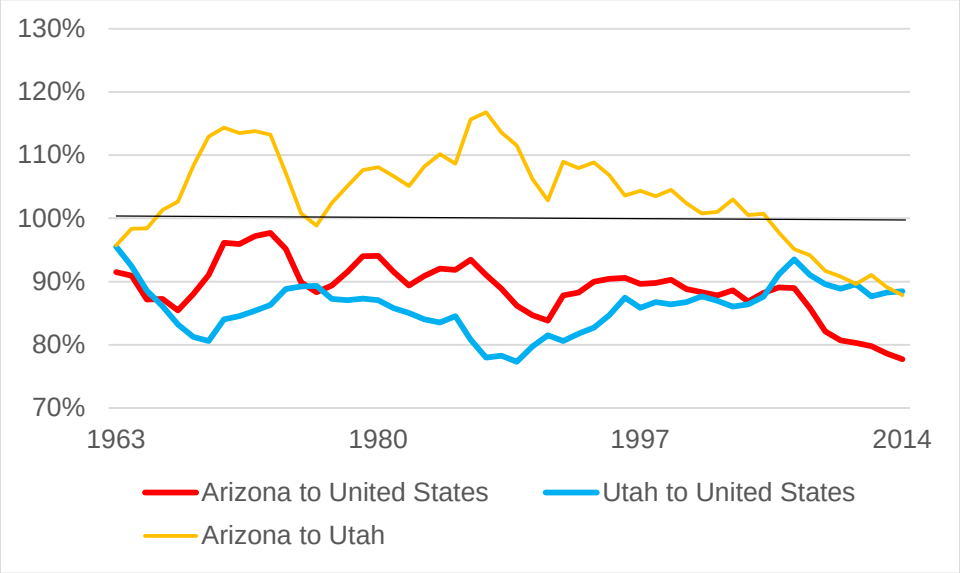
GDP per capita generally was higher in Arizona than Utah through 2005, as shown in Chart 16. The differential began to trend smaller in 1987, with Arizona falling below Utah in 2006. Arizona's figure in 2014 was 12.2 percent less than in Utah. GDP per capita has been less than the national average in each state. Arizona has trended down relative to the nation since 1973. Utah dropped significantly versus the nation between 1977 and 1989, but has since recovered its relative losses. Relative to the U.S. average in 2014, GDP per capita was 22.3 percent lower in Arizona and 11.5 percent less in Utah.

CHART 15
PER CAPITA PERSONAL INCOME RATIOS



Source: U.S. Department of Commerce, Bureau of Economic Analysis, http://www.bea.gov/regional/index.htm.

CHART 16
GROSS DOMESTIC PRODUCT PER CAPITA RATIOS



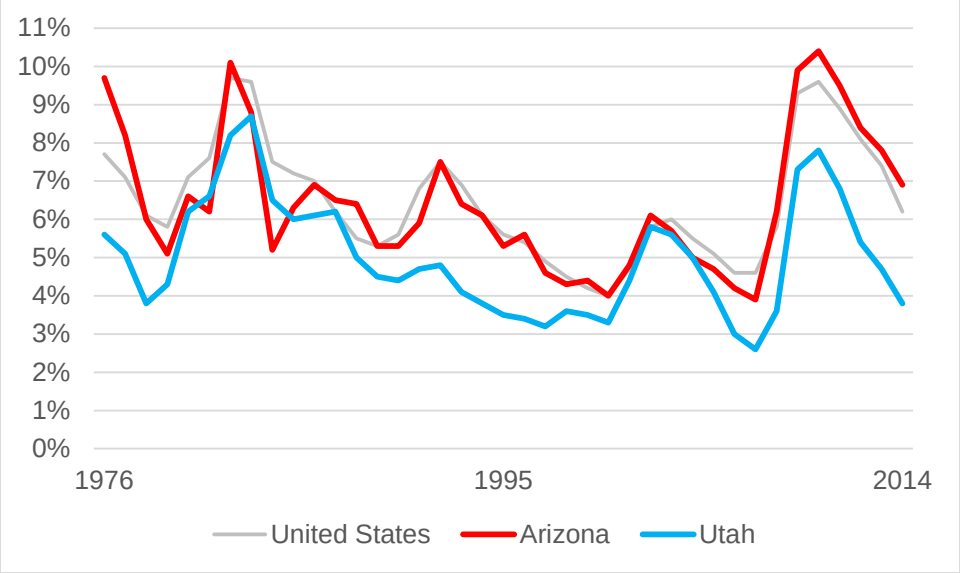
Source: U.S. Department of Commerce, Bureau of Economic Analysis, http://www.bea.gov/regional/index.htm.

The unemployment rate provides a very different indicator of prosperity. Limitations of the unemployment rate include significant margins of error in the estimates by state and the exclusion of individuals who have given up looking for work after a long period of unemployment. The earliest estimates of the unemployment rate that are available online are for 1976. Except in three years between 1976 and 2014, the unemployment rate in Arizona was higher than in Utah. Arizona's unemployment rate generally is similar to the national average, but is somewhat higher during some recessions and somewhat lower during some expansions. Except for two years, the rate in Utah has been less than the national average, often by a considerable differential (see Chart 17).

Prior to the annual American Community Survey, which began nationwide in 2005, data on household income and poverty were available from decennial censuses; the data pertained to the year before the census date. To reduce sampling error, five years of ACS data are combined.

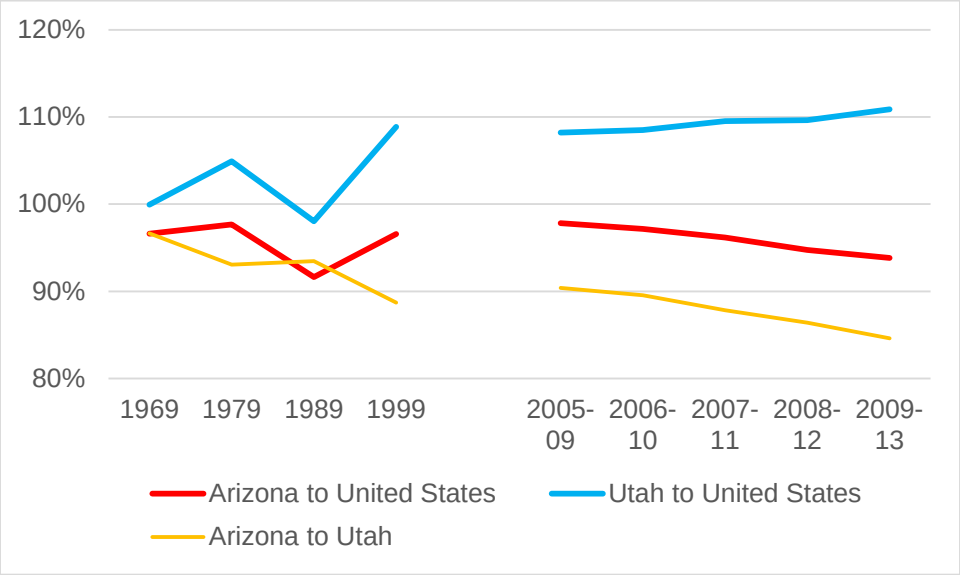
Median household income has been lower in Arizona than in Utah, with the differential increasing over time (see Chart 18). In the 2009-to-2013 period, Arizona's figure was 15.4 percent lower. While the trend is the same, *average* household income in Arizona has not been as far below Utah; the 2009-13 differential was 9.2 percent. Relative to the nation, Arizona's household income has been falling further behind. In 2009-13, Arizona's median was 6.2 percent lower and its mean was 8.9 percent lower than the U.S. average. In contrast, median household income in Utah has been greater than the national average since 1999 and the positive differential has increased somewhat over time; it was 10.9 percent in 2009-13. Utah's mean has hardly increased relative to the nation and was only barely higher than the U.S. average in 2009-13.

CHART 17
UNEMPLOYMENT RATES



Source: U.S. Department of Labor, Bureau of Labor Statistics, http://stats.bls.gov/.

CHART 18
MEDIAN HOUSEHOLD INCOME RATIOS



Source: U.S. Department of Commerce, Census Bureau, decennial censuses (1970 through 2000) and American Community Survey (2005 through 2013, Table S1901), http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml.

For both Arizona and Utah, the PCPI ratios to the nation have been lower than the median household income ratios, by an amount increasing over time. However, while Arizona's PCPI historically has been higher than in Utah, median household income has been lower in Arizona than Utah.

The poverty rate has been much higher in Arizona than in Utah. Relative to the nation, Arizona's rate has been higher while Utah's rate has been lower (see Chart 19). In 2009-13, the rates were 12.7 percent in Utah, 15.4 percent nationally, and 17.9 percent in Arizona.

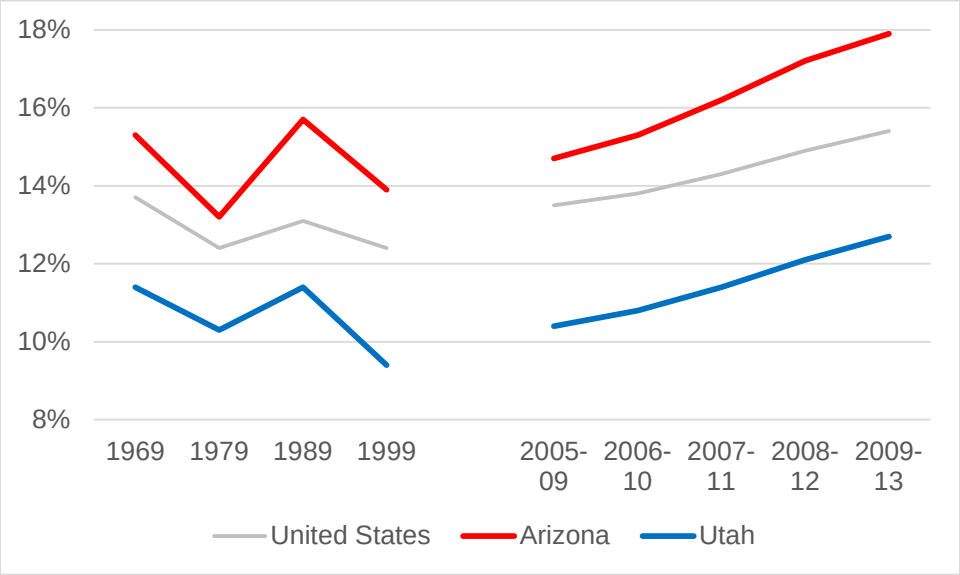
Aggregate Economic Growth

Aggregate economic growth is not correlated to gains in prosperity and productivity. Two measures of aggregate growth — GDP and total employment — are the focus of the analysis in this subsection, but other economic measures also are examined. Total economic growth is addressed first, followed by growth by sector.

Total

The historical record of annual aggregate economic growth in Arizona and Utah is shown in Chart 20 for inflation-adjusted (real) GDP and in Chart 21 for total employment. Arizona in particular, but also Utah, has a more cyclical economy than the nation. Growth rates in both states typically are considerably above the national average during economic expansions, with Arizona's rate usually higher than in Utah until recent years. During recessions, the percent change in Utah usually is similar to the nation but Arizona sometimes slumps more than the nation.

CHART 19
POVERTY RATES



Source: U.S. Department of Commerce, Census Bureau, decennial censuses (1970 through 2000) and American Community Survey (2005 through 2013, Table S1701), http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml.

Another way of examining economic growth is to calculate the annual average percent change by economic cycle. These figures are shown in Table 12 for various measures. Nationally, economic growth during the 2001-09 economic cycle was subpar due to the magnitude of the 2008-09 recession. In the current economic cycle so far, average growth rates also are below average, except on the earnings measure.

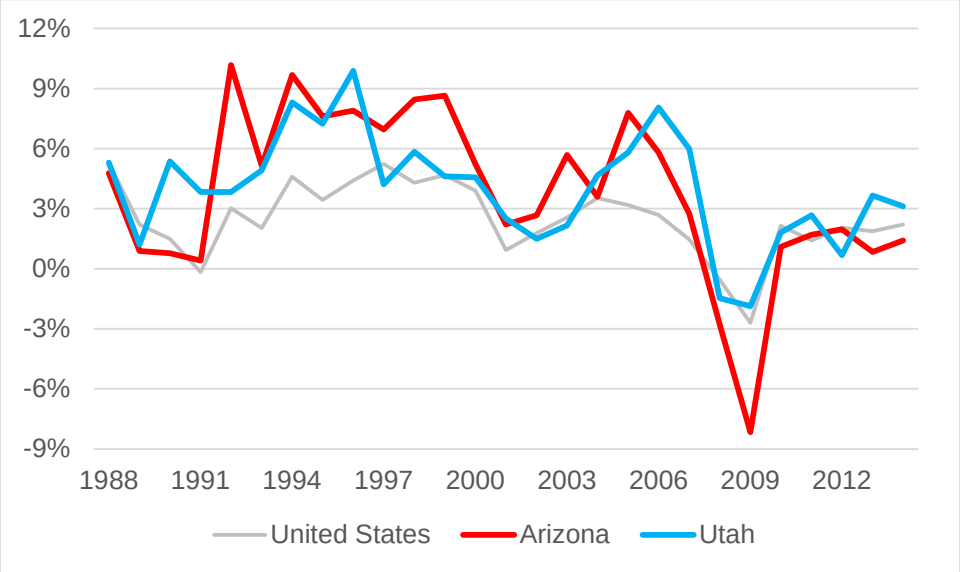
Despite the slackening of growth rates nationally since 2001, Arizona's growth rate relative to the nation has dropped to well below the norm of the four economic cycles that occurred between 1970 and 2001, particularly during the current cycle. Utah's growth rate in the current cycle also is below its historical norm. A big change has occurred in the relationship between Arizona and Utah. Through 2001, Arizona's average growth rate on each measure in each cycle was greater than in Utah. Since 2001, Arizona's growth rate has been less than that in Utah on each measure in each cycle. The last time that Arizona's aggregate growth was less than in Utah was in the 1929-to-1933 period that incorporated the Great Depression.

By Sector

In this subsection, sectoral changes in real GDP and total employment between 1998 and 2013 are examined. The total employment series produced by the BEA switched from the Standard Industrial Classification to the NAICS in 1998; GDP data for 1997 were reported for each classification system.

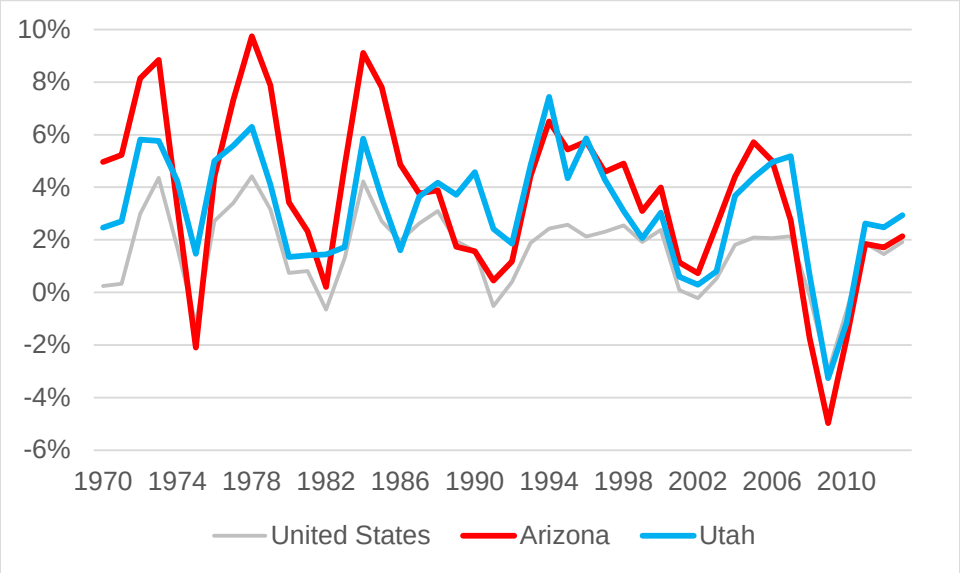
Nationally, the sectoral changes differ significantly between the real GDP measure and the total employment measure. Based on real GDP, the sectoral share dropped considerably between 1998 and 2013 in the government and construction sectors; a drop also occurred in the "other services"

CHART 20
ANNUAL PERCENT CHANGE
IN INFLATION-ADJUSTED GROSS DOMESTIC PRODUCT



Source: U.S. Department of Commerce, Bureau of Economic Analysis, http://www.bea.gov/regional/index.htm.

CHART 21
ANNUAL PERCENT CHANGE IN TOTAL EMPLOYMENT



Source: U.S. Department of Commerce, Bureau of Economic Analysis, http://www.bea.gov/regional/index.htm.

TABLE 12
ANNUAL AVERAGE PERCENT CHANGE
IN AGGREGATE ECONOMIC MEASURES BY ECONOMIC CYCLE

Cycle	US	AZ - US	UT - US	AZ - UT	US	AZ - US	UT - US	AZ - UT
	Real Gross Domestic Product				Total Employment			
1970-75					1.6%	3.0%	2.4%	0.6%
1975-82					2.1	2.9	1.5	1.4
1982-91					2.1	2.1	1.4	0.7
1991-2001	3.7%	3.5%	1.9%	1.6%	1.9	2.2	1.9	0.4
2001-09	1.5	0.6	1.6	-1.0	0.6	1.1	1.4	-0.3
2009-14*	1.9	-0.5	0.4	-1.0	1.1	-0.2	0.6	-0.7
	Real Personal Income				Real Earnings			
1970-75	2.9%	3.0%	1.8%	1.1%	1.7%	2.7%	2.3%	0.4%
1975-82	3.1	2.6	1.7	0.9	2.1	2.8	2.0	0.8
1982-91	3.5	1.6	0.2	1.4	3.5	1.4	0.1	1.4
1991-2001	3.9	2.0	1.9	0.2	4.2	2.5	1.8	0.7
2001-09	1.5	1.4	1.4	-0.0	0.8	1.1	1.5	-0.4
2009-14*	2.3	-0.6	0.7	-1.3	2.2	-0.6	0.7	-1.4

* Incomplete economic cycle; employment ends in 2013.

Source: U.S. Department of Commerce, Bureau of Economic Analysis, http://www.bea.gov/regional/index.htm.

sector. Offsetting these declines, the sectoral share rose in the information, finance and insurance, and real estate and rental sectors, with a lesser increase in the administrative and waste management services sector and in the health care and social assistance sector.

Based on employment, the greatest change in national sectoral shares between 1998 and 2013 was a large drop in manufacturing. Retail trade had the only other decline of note. Several services sectors experienced a gain in share, led by health care and social assistance.

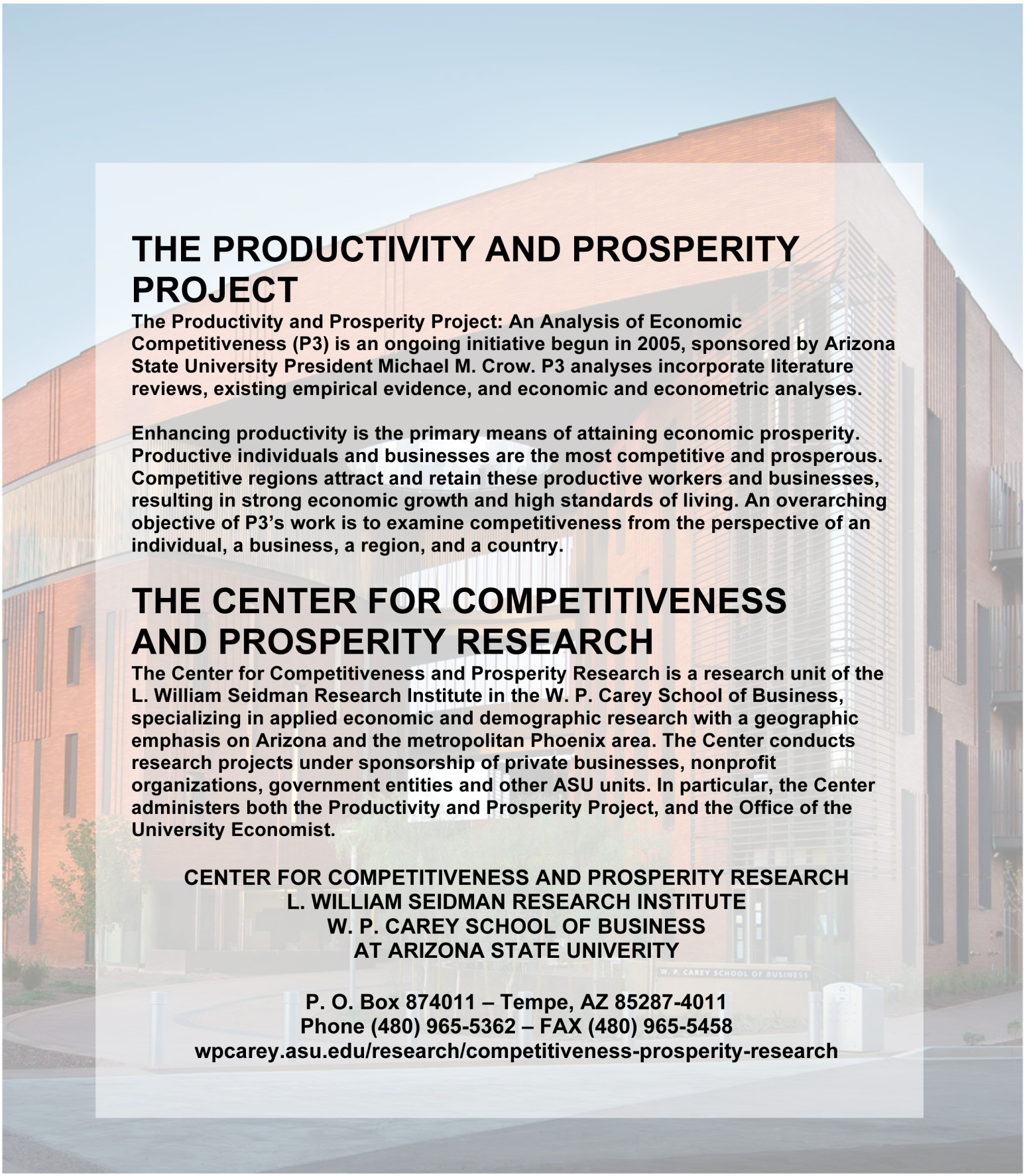
Relative to the nation, Arizona and Utah each did better in the manufacturing sector, but worse in the construction sector, on both the real GDP and employment measures between 1998 and 2013. Otherwise, based on real GDP, some notable differences between Arizona and Utah occurred in the shifts in sectoral shares. Utah experienced a much larger gain than the national average in the finance and insurance sector, while Arizona's gain was equal to the U.S. average. Government's sectoral share fell much more than average in Utah, while the decline in Arizona was only slightly greater than average. Arizona had a much larger gain than the U.S. average in the health care and social assistance sector, while the increase in Utah was a little less than average.

Subsectoral GDP data provide insight into the changes at the sectoral level. Arizona's smaller-than-average increase in the information sector's share largely was a result of the broadcasting and telecommunications subsector, but publishing industries also contributed. Utah's very large increase in the finance and insurance sector was entirely in the credit intermediation subsector. The large gain in Arizona's health care and social assistance sector largely resulted from the ambulatory services subsector, but hospitals and nursing facilities also contributed. The large

drop in government's sectoral share in Utah largely was due to state and local government, but federal civilian and military also contributed. The better performance of the manufacturing sector in Arizona and Utah mostly occurred among nondurable manufacturing subsectors. The primary exception in the manufacturing sector was other transportation equipment, which includes aerospace — this subsector's share declined more in Arizona and Utah than nationally.

In order to provide a more up-to-date look at economic performance, the monthly employment estimates from the BLS were examined. These data are not comprehensive and the estimates for much of 2014 and all of 2015 remain subject to revision. For the six-year period from August 2009 at the end of the recession until August 2015, the percentage increase in employment was nearly identical nationally and in Arizona at 9 percent, while the gain was much larger in Utah at more than 17 percent.

Considerable variation in the growth rates by sector were present in Arizona. Relative to Utah, Arizona posted a strong gain in finance and insurance. Its growth rate was much lower than in Utah in numerous sectors, including wholesale trade; real estate and rental; professional, scientific and technical services; administrative and waste management services; and arts, entertainment and recreation.



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.

CENTER FOR COMPETITIVENESS AND PROSPERITY RESEARCH
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