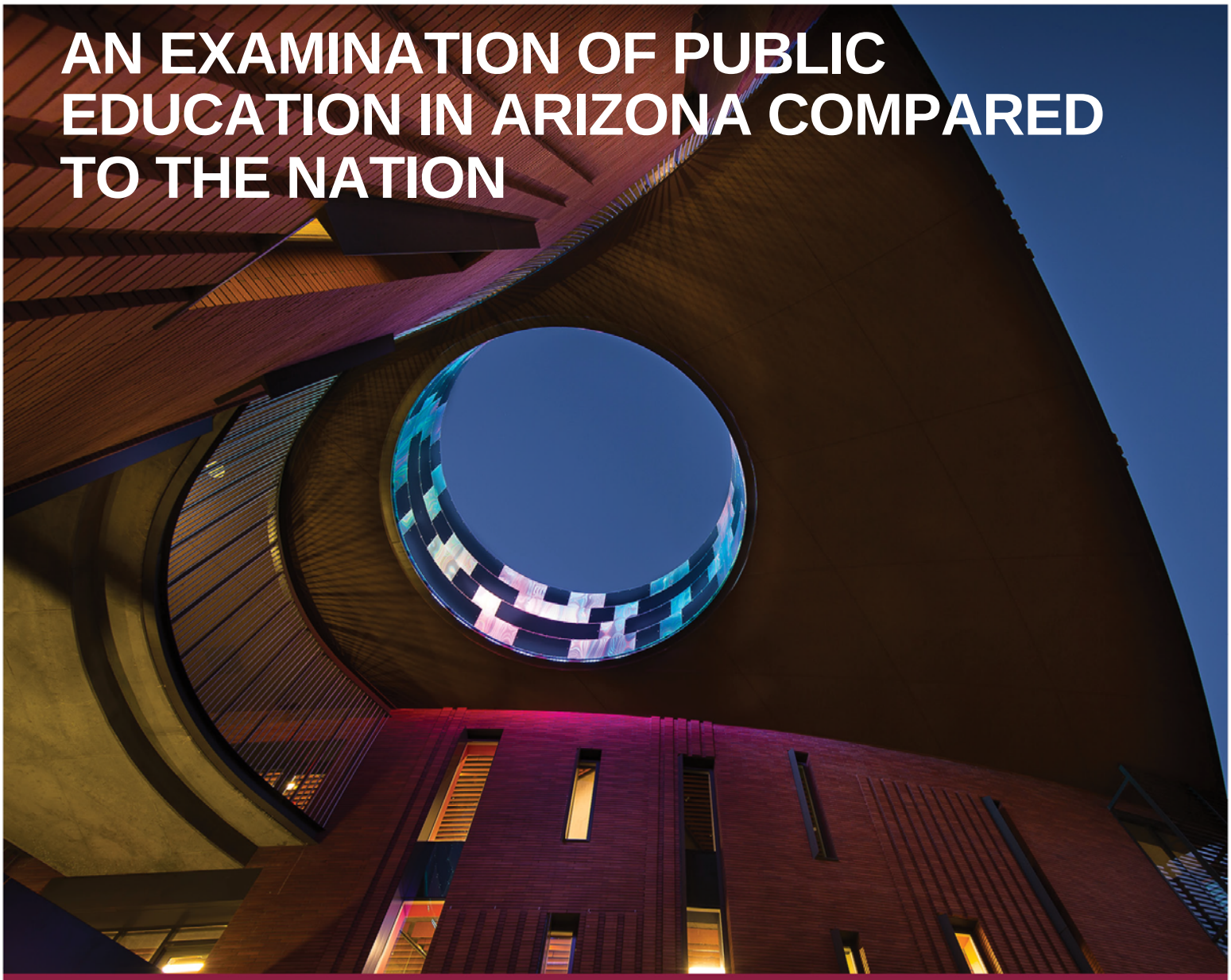
AN EXAMINATION OF PUBLIC EDUCATION IN ARIZONA COMPARED TO THE NATION



October 2018

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P3 | PRODUCTIVITY AND PROSPERITY PROJECT

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

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

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TABLE OF CONTENTS

LIST OF CHARTS

LIST OF TABLES

SUMMARY

The Arizona Constitution includes unusually strong and specific requirements related to public education. In particular, Section 10 of Article XI states that "the legislature shall make such appropriations, to be met by taxation, as shall insure the proper maintenance of all state educational institutions, and shall make such special appropriations as shall provide for their development and improvement." While not explicitly stated, this wording in the Arizona Constitution suggests that funding for public education should be higher than, and rising, relative to the national average.

For decades after statehood, state and local government funding per student in Arizona indeed was above the national average. Today, however, per student funding for elementary and secondary education is nearly the lowest in the country and the per student appropriation for higher education also is among the lowest in the nation.

The low funding per student is a significant issue since the educational achievement and attainment of Arizona's students are below the national norms and since such factors as classroom size and teacher qualifications have been found to have a significant effect on student performance. Relative to national norms, Arizona's elementary and secondary students score poorly on achievement tests and the high school graduation rate is below average. The educational attainment of adults living in Arizona who were born in the state also is below average.

Low educational achievement and attainment contribute to the low household incomes and high poverty rates experienced in Arizona. Workforce availability and quality is the most important economic development factor, but the state's low educational achievement and attainment cause Arizona to compare poorly on this most important business location factor.

Amount of Funding Needed to Reach the Per Student National Average

After decades of declining support for public education relative to the national average, Arizona is far below the norm in per student funding, even after adjusting for the state's below-average cost of living. The projected shortfall from the national average in state and local government appropriations in fiscal year 2019 is $666 million for higher education and $3.84 billion for elementary and secondary education. The latter figure incorporates the 2018 commitment by the Governor and the Legislature to boost elementary and secondary teacher salaries by 20 percent by fiscal year 2020 — a cost of about $645 million. Thus, the remaining total shortfall from the per student national average, after adjusting for the cost of living, is $4.51 billion for public education from prekindergarten through graduate school.

However, the funding shortfalls described in the prior paragraph do not consider "fiscal need." A state with a high proportion of disadvantaged elementary and secondary students — such as those living in poverty — needs to spend more than the national average per student in order to attain average results in terms of educational achievement and attainment. A recent study estimated Arizona's fiscal need for elementary and secondary education to be 11 percent above the national average. Arizona's need for elementary and secondary spending per student was fifth highest in the nation, but actual spending ranked 50th. In contrast, the fiscal need for higher education in Arizona was assessed as being marginally less than the national average.

Considering fiscal need, the projected shortfall in education funding in Arizona in fiscal year 2019 is $658 million for higher education and $4.33 billion for elementary and secondary education — a total of $4.99 billion.

While additional funding in Arizona in the range of $4.5 billion (not considering fiscal need) to $5 billion (considering fiscal need) for pre-kindergarten through graduate school public education may seem like a very large figure, $5.15 billion in additional revenue for the state's general fund would have been realized in fiscal year 2019 had no changes to tax laws been made since the early 1990s. More than half ($2.61 billion) of the net loss of revenue resulted from tax law changes to the individual income tax, primarily through a series of tax rate reductions. Changes in tax laws affecting the corporate income tax reduced revenue by $975 million.

Moreover, according to the Arizona Joint Legislative Budget Committee, Arizona state government spending in fiscal year 2019 could be $6.1 billion higher without exceeding the appropriations limit. The constitutional appropriations limit is 7.41 percent of personal income and applies to most revenue collected by state government, whether deposited to the general fund or to other funds.

Elementary and Secondary Education

Revenue from state and local governments per elementary and secondary student in Arizona was second lowest in the nation at 36 percent below the national average after adjusting for the cost of living, according to the latest data for fiscal year 2016. Even with above-average revenue per student from federal government, total revenue per student was 32 percent below average, third lowest in the nation. This very-low funding is a substantial change from Arizona's historical record. Per student revenue was above the national average into the 1950s, then was approximately equal to the U.S. average through the mid-1980s.

Given the limited amount of revenue available, per student expenditures in Arizona in fiscal year 2016 were below average in every category and far below average in most categories, including instruction and administration. Significant declines have occurred over time relative to the national average, particularly in the administration categories.

Funding is a key input to public elementary and secondary education since it has direct impacts on such factors as classroom size and teacher qualifications — factors that have been found to have a significant impact on student achievement and attainment. Arizona has the second-highest student-teacher ratio among the states and also has a large number of students per staff in nearly every occupation. Compared to the national average, Arizona's teachers have fewer years of teaching experience and lesser academic credentials. They also are paid far less than the national average, even after adjusting for their lesser experience and educational attainment, which contributes to the existing teacher shortage.

As expected from the limited financial support for public elementary and secondary education, Arizona's above-average needs due to its high proportion of disadvantaged children, and research that links these factors to student achievement and educational attainment, Arizona's

students score significantly below average on achievement tests. A below-average share graduate from high school, and a below-average proportion go on for higher education.

Assuming that state government revenue will be sufficient to complete funding of the existing plan to boost teacher pay 20 percent by fiscal year 2020, average teacher pay in Arizona should approximate the national average. However, sustaining this additional funding will be a severe challenge during the next economic downturn, during which state government revenue will fall significantly. Moreover, to keep pace with other states, further salary increases will be necessary.

Even assuming that the increased appropriations for elementary and secondary education are maintained, significant funding needs beyond teacher pay are present in elementary and secondary education in Arizona. The $3.8 billion shortfall cited earlier encompasses the need for a much greater number of teachers in order to reduce class size, substantially greater funding for nonteaching staff in the form of higher salaries and an increase in the number of employees, additional funding for supplies (so teachers do not feel the need to purchase supplies with their own money), etc.

Higher Education

State and local government appropriations for higher education per full-time-equivalent (FTE) student adjusted for the cost of living were 30 percent below average in Arizona in fiscal year 2017, among the 10 lowest in the country. In contrast, tuition per FTE student — adjusted for the cost of living but not considering financial aid — was 30 percent above average. Historically, appropriations per FTE student were slightly below average, as was average tuition. Between fiscal years 2008 and 2017, the increase in tuition per full-time-equivalent student was third highest in the nation, while only one state experienced a larger decrease in appropriations per full-time-equivalent student.

In fiscal year 1980, state and local government appropriations in Arizona accounted for 79 percent of the sum of appropriations and tuition at public institutions of higher education, the same share as the national average. In fiscal year 2017, the appropriations share was only 39 percent in Arizona, less than the U.S. average of 54 percent. Thus, tuition revenue in Arizona greatly exceeds revenue received from appropriations.

As tuition at Arizona's universities has increased, university funding for financial aid also has risen in order to reduce the financial burden of students. Thus, while the increase in tuition has largely offset the decrease in appropriations, the result has been a decline in university revenue available for purposes other than financial aid.

Average tuition — not considering financial aid — is considerably above average for in-state students at Arizona's public universities. A boost in state and local government appropriations per FTE student would allow tuition to be reduced. In contrast, tuition is below average for in-state students at the state's public community colleges.

INTRODUCTION

In this paper, a broad evaluation of public education in Arizona is presented, with comparisons to other states and to the nation. Elementary and secondary education as well as higher education are examined. Current and historical data are used. It is the second of two papers to address education finance. The September 2018 report "The Relationship Between Government Finance, Educational Attainment, and Economic Performance" (https://wpcarey.asu.edu/sites/default/files/taxeducecon09-18.pdf) focused on long time series, primarily of total revenues and expenditures, and included several charts. In the sections addressing education finance in this second paper, the focus is on categories of revenues and expenditures, using a shorter time frame.

These two papers were prompted by several factors:

- The language in the Arizona Constitution regarding support for public education.
- Relatively low and falling public spending for education in Arizona relative to the rest of the nation, as exemplified by the teachers' strike in spring 2018.
- The below-average performance of Arizona's elementary and secondary education students, as measured by achievement tests and graduation rates.
- The below-average educational attainment of Arizona's adult residents, including those who likely were educated in Arizona and those active in the workforce.
- The importance to Arizona's economy of an educated workforce.
- The state's below-average performance on measures of economic productivity and prosperity.

Many of the topics discussed in this paper were included in the January 2009 paper "Education Funding in Arizona: Constitutional Requirement and the Empirical Record" (http://wpcarey.asu.edu/sites/default/files/uploads/research/competitiveness-prosperity-research/EdFunding1-09.pdf).

The Arizona Constitution

The Arizona Constitution was written during a constitutional convention held in 1910. It was approved by the President of the United States when Arizona became a state in February 1912. Like other constitutions, Arizona's original constitution was short. It generally did not go into much detail, leaving that to be done by the Arizona Legislature through statute. Many modifications and expansions to the Arizona Constitution have been made since 1912. Compared both to other state constitutions, and to other governmental functions in Arizona, the Arizona Constitution includes unusually strong and specific requirements related to education.

Section 1 of Article XI of the Arizona Constitution specifies the components of the public school system:

> "The legislature shall enact such laws as shall provide for the establishment and maintenance of a general and uniform public school system, which system shall include:
>
> 1. Kindergarten schools.
> 2. Common schools.
> 3. High schools.
> 4. Normal schools.
> 5. Industrial schools.

6. Universities, which shall include an agricultural college, a school of mines, and such other technical schools as may be essential, until such time as it may be deemed advisable to establish separate state institutions of such character.

The legislature shall also enact such laws as shall provide for the education and care of pupils who are hearing and vision impaired."

Section 6 specifies that public education shall be as nearly free as possible:

"The university and all other state educational institutions shall be open to students of both sexes, and the instruction furnished shall be as nearly free as possible. The legislature shall provide for a system of common schools by which a free school shall be established and maintained in every school district for at least six months in each year, which school shall be open to all pupils between the ages of six and twenty-one years."

Section 8 provides a funding source for common and high schools:

"A permanent state school fund for the use of the common schools shall be derived from the sale of public school lands or other public lands specified in the enabling act approved June 20, 1910; from all estates or distributive shares of estates that may escheat to the state; from all unclaimed shares and dividends of any corporation incorporated under the laws of Arizona; and from all gifts, devises, or bequests made to the state for general educational purposes.

The rental derived from school lands, with such other funds as may be provided by law shall be apportioned only for common and high school education in Arizona, and in such manner as may be prescribed by law."

In Section 10, additional funding for public education from taxation is mandated. Guidance is provided as to the level of funding required, specifying that not only should the public educational institutions be properly maintained, but that special appropriations shall be made to provide for their development and improvement:

"The revenue for the maintenance of the respective state educational institutions shall be derived from the investment of the proceeds of the sale, and from the rental of such lands as have been set aside by the enabling act approved June 20, 1910, or other legislative enactment of the United States, for the use and benefit of the respective state educational institutions. In addition to such income the legislature shall make such appropriations, to be met by taxation, as shall insure the proper maintenance of all state educational institutions, and shall make such special appropriations as shall provide for their development and improvement."

The first sentence of Section 10 refers to the sale and lease of state trust land. Focusing on the second sentence, the constitutional requirement that the Arizona Legislature shall provide funding for public education from tax revenue is clear. No distinction is made between elementary, secondary, and higher education.

To help interpret the constitutional requirement, the following words are defined:

- Proper: appropriate to the purpose; normal or regular.
- Maintain: to keep in due condition or operation; to provide for the upkeep or support of.
- Develop: to bring to a more advanced or effective state; strengthen.

- Improve: to bring into a more desirable or excellent condition; to increase in value.

None of these terms are absolute; some degree of subjectivity is present. In the context of state spending, "proper" might be interpreted as being close to the national average or the median state. The "development and improvement" clause indicates that the writers of the Constitution intended that "all state educational institutions" be enhanced — that "proper maintenance" is not enough. Thus, while not explicitly stated, the wording of the Arizona Constitution suggests that funding for public education should be above the national average. For more than five decades after statehood, funding per student in Arizona indeed was above the national average.

In contrast to the educational specifications, most of the current state government functions are not addressed in the Arizona Constitution. Of those that are specified, funding for these state government duties is not even mentioned. Thus, funding is determined by the Legislature without constitutional guidance except in the case of public education.

Among the sections highlighted above, the current constitutional language is identical to that written in 1910 except for the second paragraph in Section 8. Thus, in 1910 as well as today, the Arizona Constitution is much more explicit regarding the provision of public education, and the funding for education, than it is for any other state government duty.

Description and Limitations of Data

Education data are expressed by academic year (also known as school year). Generally, an academic year begins sometime between the first of July and September and ends in May or June. The academic year generally is consistent with the fiscal year (FY); the latter terminology is used in this paper. Some of the education data, such as enrollment, are expressed as of a specific date in the fall. For example, fall 2015 was part of fiscal year 2016.

Elementary and secondary education covers the grades from pre-kindergarten through 12th grade. Higher education generally is defined as degree-granting institutions, including "two-year" institutions (community colleges) and "four-year" institutions (universities). Some of the higher education data, particularly the finance data, are available only for the combination of two-year and four-year institutions.

The primary source of data — for elementary/secondary education and for higher education — is the National Center for Education Statistics (NCES), part of the U.S. Department of Education. Some of these data come from periodic surveys, while other data are reported annually to the NCES by school districts and institutions of higher education. In the case of elementary and secondary education, the annual data are part of the Common Core of Data (CCD). In general, data from the NCES are slow to be released. The latest data for elementary and secondary education vary between fiscal years 2015 and 2016; the latest higher education data are for FY 2016 or FY 2017.

Most of the data from the NCES were obtained from its annual publication, the *Digest of Education Statistics*. Data by state are available electronically back to the early 1990s (https://nces.ed.gov/programs/digest/). For the purposes of this paper, older data were manually collected for some data series, usually only for Arizona and the nation. For some topics, consistent data do not even extend back to the early 1990s.

The data reported annually are subject to misreporting and incomplete reporting by the organizations that supply the data to the NCES; errors are obvious in some datasets. Further, student data systems used by schools have long been hampered by the movement of students from one school to another. While the systems have been improved, withdrawals and transfers to other schools are not always reported by parents/students, negatively affecting the quality of the data on high school graduation. For those data derived from periodic surveys, sampling error is a concern when using state-level data.

In addition to the NCES, educational data from other sources are examined in this paper. Most of these sources report data only on a specific topic. These data sources are described when first introduced.

Tabular data presented in this paper focus on the latest year of data, the change between fiscal year 1993 (or, if data for FY 1993 are not available, the earliest year of data) and FY 2008, and the change between FY 2008 and the latest year of data (which varies from FY 2015 through FY 2017). Fiscal year 1993 was selected for two reasons: (1) it often is the earliest year of available data, and (2) since the early 1990s, the Arizona Legislature has pursued a policy of substantial tax reductions, which have limited the amount of funding available for education and other public programs. Fiscal year 2008 was selected since it represents a transition to a deep recession that was followed by a subpar economic expansion. During this period, the amount of funding available for public education was restricted.

In addition to comparing Arizona to the national average, the state's rank among all states and the District of Columbia is provided in this paper, as is the state's rank among 10 western states: Arizona, California, Colorado, Idaho, Nevada, New Mexico, Oregon, Texas, Utah, and Washington.

Standardization of Data

Since the size of states varies so widely, dollar measures and other educational indicators, such as the number of degrees awarded, that are used to compare states must be adjusted for state size. In order to compare Arizona to the nation and to other states, the educational data generally are adjusted by the number of students. For higher education, full-time-equivalent (FTE) enrollment typically is used instead of the enrollment headcount since so many students, particularly at community colleges, are enrolled part time. In analyses over time, the adjustment for the number of students also controls for differences across states in the rate of growth.

Data measured in dollars are adjusted, when possible, for geographic differences in the cost of living, which are substantial across states. The U.S. Bureau of Economic Analysis (BEA) produces annual estimates of living costs by state, referred to as the regional price parity (RPP), but these estimates are available only for calendar years 2008 through 2016. Consecutive calendar years are averaged to provide a fiscal year estimate of the cost of living, resulting in fiscal year estimates available only for 2009 through 2016. Cost-of-living estimates that were published by other organizations for earlier years suggest that geographic differences in the cost of living have not changed much over the last 25 years. Thus, although time series analyses in

this paper that begin before FY 2009 do not incorporate the cost of living, the historical pattern likely would not be much different if cost-of-living estimates were available.

Time series analyses of dollar measures need to be adjusted for inflation. Most commonly in analyses of government finance, the adjustment for inflation is made using the national gross domestic product implicit price deflator (GDP deflator) produced by the BEA.

ELEMENTARY AND SECONDARY EDUCATION

Most of the discussion in this section is specific to public schools, with the data for traditional and charter schools combined.[1] In the enrollment subsection, public school enrollment is separated into traditional schools and charter schools and is compared to private school enrollment and to the number of children homeschooled.

Enrollment

In most states, parents have four educational choices: public traditional school, public charter school, private school, and homeschooling. Enrollment data by state are available for private schools, all public schools, and charter schools, but an official estimate of the number homeschooled is not available by state. The enrollment data include those in preschool, but since a minority of 3-and 4-year olds are enrolled (47.6 percent nationally and 37.7 percent in Arizona in fall 2015), preschool enrollment is subtracted in Table 1, which shows the number of children receiving their education under the various options.

The number being educated is compared to the U.S. Census Bureau's estimate of the population 5-through-17 years old. This comparison is inexact since the population estimate is for July 1, a few months before the enrollment figures, and since not all of the children being educated are

TABLE 1
NUMBER OF CHILDREN AND EDUCATIONAL PARTICIPATION, 2015

	United States			Arizona		
	PK-12	PK	K-12	PK-12	PK	K-12
Total Enrollment	56,188,563	2,248,565	53,939,998	1,165,650	17,084	1,148,566
Private Schools	5,750,520	846,920	4,903,600	56,610	8,337	48,273
Public Schools	50,438,043	1,401,645	49,036,398	1,109,040	8,747	1,100,293
Traditional Schools	47,592,721			932,146		
Charter Schools	2,845,322			176,894		
Number Homeschooled			1,690,000			35,824
Total Enrollment + Homeschooled			55,629,998			1,184,390
Population Age 5 Through 17			53,712,646			1,186,796

Notes and Sources:
PK-12: pre-kindergarten through 12th grade; K: kindergarten.
Enrollment figures are for fall 2015, as reported by the U.S. Department of Education, National Center for Education Statistics. Pre-kindergarten enrollment at private schools in Arizona is estimated based on the PK share of private enrollment nationally.
The number homeschooled nationally is based on a NCES survey. The Arizona figure is the average of two estimates provided by https://a2zhomeschooling.com/thoughts_opinions_home_school/numbers_homeschooled_students/ and https://www.responsiblehomeschooling.org/homeschooling-101/homeschooling-numbers/.
The population age 5 through 17 is for July 1, 2015, as estimated by the U.S. Department of Commerce, Census Bureau.

[1] A charter school is a public school that is independently run. The school is established by a "charter," which is a performance contract describing key elements of the school. Charter schools are organized and operated in a variety of ways. Each charter school has a sponsoring entity or authorizer as well as a governing board. Some charter schools are organized as nonprofit corporations or for-profit corporations.

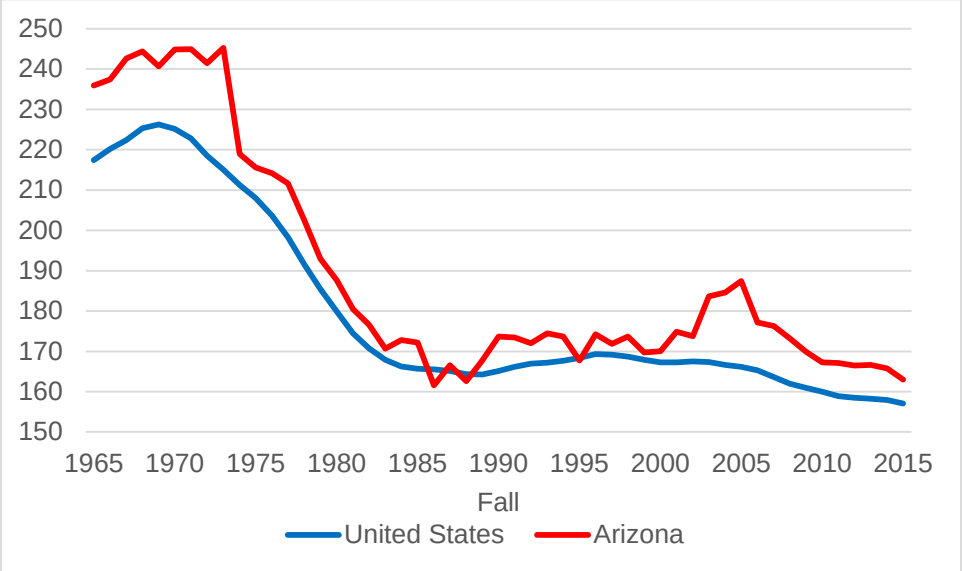
between the ages of 5 and 17 in the fall. As seen in the table, the number of children being educated in Arizona is quite close to the estimated population, while the national population estimate is nearly 2 million below the calculated number of children being educated.

Public Schools

Nationally, public school enrollment in fall 2015 represented 88.1 percent of the number of children being educated. The proportion was higher in Arizona at 92.9 percent. In part due to this higher proportion and in part due to the higher share of school-age children among Arizona's residents, the number enrolled in Arizona's public schools per 1,000 residents generally has been higher than the national average, as seen in Chart 1. The big decrease nationally and in Arizona during the 1970s and early 1980s in the number of public school students per 1,000 residents largely was the result of the large decline in the number of births that occurred after the end of the baby boom in 1964.

Arizona was one of the first states to create charter schools, with the first charter schools opening in 1995. Since then, charter schools have been created in most states. Nationally, of those children who attend a public school, the proportion who go to a charter school increased from less than 1 percent in fall 1999 to 5.6 percent in fall 2015, using data from the NCES. Enrollment at charter schools was 2.85 million in fall 2015. In Arizona, the proportion of public school students enrolled at charter schools climbed from 3.7-to-16.0 percent between the falls of 1999 and 2015. Since the earliest NCES data in fall 1999, Arizona's proportion has been second

CHART 1
ENROLLMENT PER 1,000 RESIDENTS,
PUBLIC ELEMENTARY AND SECONDARY EDUCATION



Sources: U.S. Department of Education, National Center for Education Statistics (enrollment) and U.S. Department of Commerce, Census Bureau (population).

highest in the nation, behind the District of Columbia. According to the Arizona Department of Education, charter school enrollment in the state rose to nearly 186,000 in fall 2016 — 16.4 percent of the public school total.

Private Schools

Enrollment figures for private schools are reported for the fall of odd-numbered years by the NCES. Enrollment at private schools disproportionately is in pre-kindergarten and kindergarten. Nationally in fall 2015 at private schools, pre-kindergarten enrollment was nearly 850,000, kindergarten enrollment was nearly 470,000, and enrollment in grades 1 through 12 ranged from about 350,000 to 375,000 per grade. Approximately 36 percent of private school enrollees attended a Catholic school, nearly 40 percent attended another religious school, and 24 percent attended a nonsectarian school.

In fall 2015, 8.8 percent of the children being educated nationally attended a private school. The share (4.1 percent) was less than half as much in Arizona.

In contrast to the growing popularity of charter schools, the share of children attending a private school has declined. Over the period from fall 1991 through fall 2015, of all children attending a school nationally, the share attending a private school was highest in fall 2001 at 11.7 percent. In fall 2015, the proportion was down to 10.2 percent. Not only has the proportion declined, the number of children attending private school also has fallen, from a peak of 6.32 million in fall 2001 to 5.75 million in fall 2015. Despite the decline at private schools, enrollment at private schools nationally still was twice that of charter schools in fall 2015. In Arizona in contrast, the private school proportion is considerably less than the share at charter schools (see Chart 2).

Homeschooled

A survey of those homeschooled is conducted every four-to-five years by the NCES, but results are reported only for the nation. In 2016, the estimated number homeschooled nationally was 1.7 million, about 3 percent of the school-age population. From the national data, some organizations have estimated the number homeschooled by state.[2] In Arizona, estimates for recent years range from approximately 34,000 to 37,000 children homeschooled, also about 3 percent of the number of children being educated.

School Finance

Two sources provide a time series of public elementary and secondary education finance by state. The Census Bureau produces an annual report "Public Education Finances" (https://www.census.gov/programs-surveys/school-finances.html). Data for some categories extend back to FY 1978; the data for fiscal years 1992 through 2016 are available online at http://www.census.gov/govs/school/. The NCES also provides revenue and expenditure data, but its time series is much longer, extending back into the 19th century (though the data were generated every other year until FY 1976, with data missing for some of these years). Data by state are available online (https://nces.ed.gov/) back to FY 1993; the latest data are for FY 2015.

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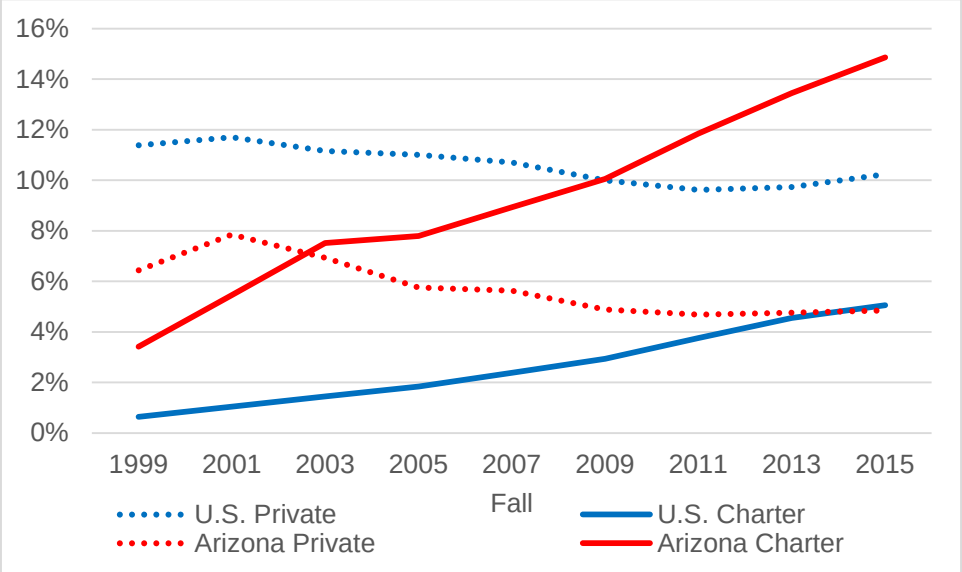
[2] For example, see https://a2zhomeschooling.com/thoughts_opinions_home_school/numbers_homeschooled_students/ and https://www.responsiblehomeschooling.org/homeschooling-101/homeschooling-numbers/.

CHART 2
SHARE OF TOTAL PUBLIC AND PRIVATE ELEMENTARY AND SECONDARY SCHOOL ENROLLMENT AT PRIVATE SCHOOLS AND CHARTER SCHOOLS



Note: Charter school enrollment is not available from the NCES for 2001 and 2007; the values displayed were interpolated. Charter school enrollment in Arizona reported by the NCES for 2013 is substantially out of line with figures provided by other sources. Enrollment from the Arizona Department of Education was used for 2011, 2013, and 2015.

Source: U.S. Department of Education, National Center for Education Statistics.

Historically, the data from the two sources were very similar. More recently with the advent of charter schools, there is a distinction between the two sources since charter schools operated by a nongovernmental entity are not included in the Census Bureau's dataset.

The time series of total revenues and expenditures of public elementary and secondary education were discussed in the September 2018 report "The Relationship Between Government Finance, Educational Attainment, and Economic Performance." Categorical detail is emphasized below.

Revenue

Public elementary and secondary schools receive revenue from three sources: federal, state, and local governments. Most of the state government revenue is based on a formula tied to enrollment; the funding from the state may come from income taxes, sales taxes, or other revenue sources employed by state government. The property tax provides the bulk of the local government funding. Since states vary in their approach to funding public elementary and secondary education, a comparison of states is more meaningful when state and local government revenues are combined.

Census Bureau. Public elementary and secondary school revenue data by state and by the level of government providing the funding are available for fiscal years 1987 through 2016 from the Census Bureau. Table 2 summarizes the FY 2016 per student revenue data adjusted for the cost

of living. Total per student funding and per student state and local revenue in Arizona were substantially below the national average. Idaho and Utah were the only states that ranked lower on per student total revenue and only Idaho was lower on per student state and local revenue. Among the 50 states, only South Dakota was lower on per student state revenue. Nationally, federal revenue accounted for only 8.1 percent of the total, but with per student federal revenue in Arizona above the national average and per student state and local revenue far below average, the federal share in Arizona was 13.8 percent.

The change over time in per student revenue is expressed in two ways in Table 3. In the left portion of the table, the change between the specified years in Arizona's percentage of the nation and in Arizona's ranks are displayed. The right side of the table provides the inflation-adjusted (real) percent changes in per student revenue in Arizona and the nation. The ranks are determined from the real percent change.

While the real percent changes in revenue per student between fiscal years 1993 and 2008 in Arizona and the nation appear to be large, the ability to pay, as measured by real per capita personal income, also rose substantially over this time period — by 38.2 percent nationally and 41.8 percent in Arizona. Thus, Arizona's per student state and local revenue relative to the ability to pay *dropped* over this time period. The real percent change in per student revenue in Arizona ranked among the bottom 10 states overall, in federal revenue, and in state and local revenue.

The real percent change in total per student revenue between fiscal years 2008 and 2016 was much smaller nationally than in the earlier period, in part reflecting much lesser growth in real per capita personal income (6.5 percent). Arizona's real per capita personal income dropped 2.0 percent over this period, but per student total revenue and per student state and local revenue fell even more. Per student funding for elementary and secondary education in Arizona relative to the ability to pay has decreased since the late 1980s (see Chart 3).

TABLE 2
REVENUE PER STUDENT FROM THE CENSUS BUREAU ADJUSTED FOR THE COST OF LIVING, PUBLIC ELEMENTARY AND SECONDARY EDUCATION, ARIZONA, FISCAL YEAR 2016

	Nation	Arizona	Arizona Percent of Nation	Arizona Rank, 51 "States"	Arizona Rank, 10 Western States
Total Revenue	$13,814	$9,364	67.8%	49	8
Federal Revenue	1,115	1,290	115.7	14	2
State and Local Revenue	12,699	8,074	63.6	50	9
State	6,546	3,822	58.4	49	10
Local	6,153	4,253	69.1	35	4

Note: State revenue is limited to the 50 states.

Source: U.S. Department of Commerce: Census Bureau, Public Education Finance (revenue and enrollment) and Bureau of Economic Analysis (regional price parity).

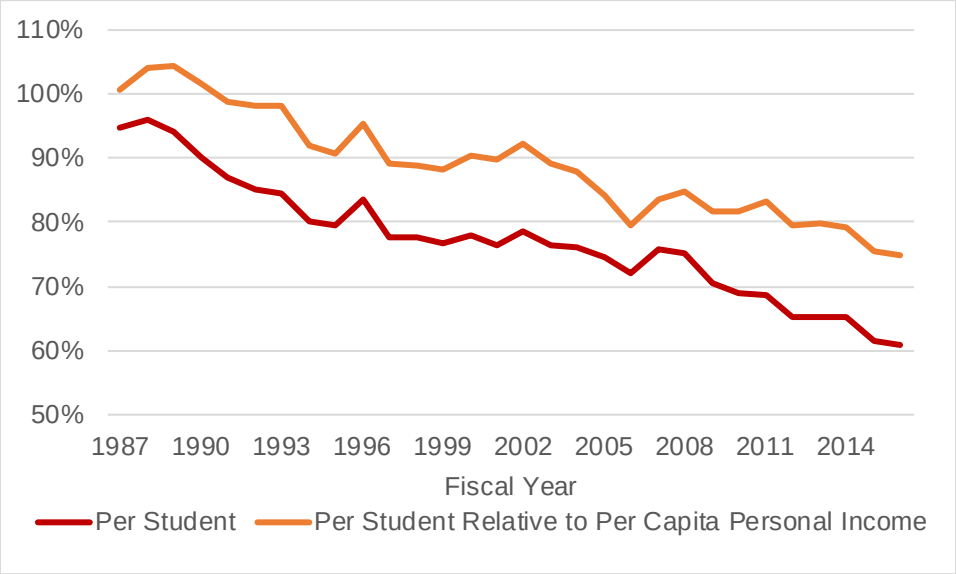
TABLE 3
CHANGE IN REVENUE PER STUDENT FROM THE CENSUS BUREAU, PUBLIC ELEMENTARY AND SECONDARY EDUCATION, ARIZONA

	Change			Real Percent Change				
	Percent of Nation	Rank, 51 "States"	Rank, 10 Western States	Nation	Arizona	Difference	Rank, 51 "States"	Rank, 10 Western States
Fiscal Years 1993 through 2008								
Total Revenue	-9.7	-10	-1	50.4%	33.6%	-16.8	45	8
Federal Revenue	-20.3	-11	-1	83.9	53.6	-30.3	45	10
State and Local Revenue	-9.4	-8	-1	48.1	31.5	-16.6	44	7
State	-0.1	1	2	56.3	56.1	-0.2	25	4
Local	-19.0	-7	0	39.9	10.7	-29.2	44	9
Fiscal Years 2008 through 2016								
Total Revenue	-12.4	-3	0	2.0	-14.3	-16.3	49	10
Federal Revenue	8.0	2	0	1.8	9.6	7.8	10	2
State and Local Revenue	-14.1	-5	-1	2.0	-17.2	-19.2	50	10
State	-21.8	-9	-3	0.1	-27.9	-28.0	50	10
Local	-5.8	-3	-2	4.0	-4.3	-8.3	36	8

Note: State revenue is limited to the 50 states.

Source: U.S. Department of Commerce: Census Bureau, Public Education Finance (revenue and enrollment) and Bureau of Economic Analysis (gross domestic product implicit price deflator).

CHART 3
STATE AND LOCAL GOVERNMENT REVENUE FROM THE CENSUS BUREAU, PUBLIC ELEMENTARY AND SECONDARY EDUCATION, ARIZONA AS A PERCENTAGE OF THE NATIONAL AVERAGE



Sources: U.S. Department of Commerce: Census Bureau, Public Education Finance (revenue and enrollment) and Bureau of Economic Analysis (per capita personal income).

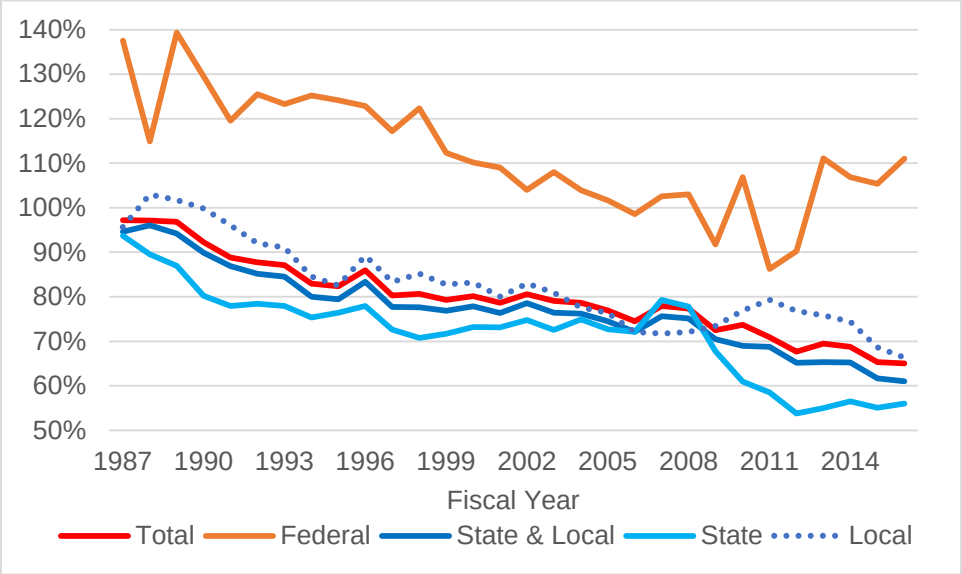
Per student revenue in Arizona relative to the U.S. average by year and by source for the entire fiscal year 1987-through-2016 period is displayed in Chart 4. In general, total revenue per student and state and local revenue per student in Arizona fell from FYs 1987 through 2016 relative to the nation. State revenue per student dropped considerably from FYs 2008 through 2012. Federal revenue per student in Arizona relative to the nation has been more erratic but also displays a downward trend.

NCES. Revenue of elementary and secondary schools by source as reported by the NCES are available back to Arizona's statehood. Table 4 summarizes the fiscal year 2015 per student revenue data adjusted for the cost of living. Though the NCES data in Table 4 are for FY 2015 and the Census Bureau data in Table 2 are for FY 2016, the ratio to the nation and the ranks generally are consistent by category.

A more direct comparison of the NCES and Census Bureau data for fiscal year 2015 reveals some differences between the two series. The Census Bureau reports more state revenue per student but less local revenue per student in Arizona relative to the national average. Combined state and local revenue per student in Arizona as a percentage of the national average is lower (64.2 percent) based on the Census Bureau's data than on the data from the NCES (68.3 percent). In contrast, federal revenue per student is nearly identical from the two sources. Based on both sources, state and local revenue per student in Arizona in FY 2015 was far below the national average, with lower figures only in Idaho and Utah.

Inflation-adjusted percent changes in per student revenue between fiscal years 1993 and 2015 are displayed in Table 5. A comparison between the data from the NCES and the Census Bureau of the changes between FYs 1993 and 2008 and between FYs 2008 and 2015 shows broad similarities with some small differences. In both time periods, Arizona's per student total revenue and per student state and local revenue declined slightly more relative to the national

CHART 4
REVENUE PER STUDENT FROM THE CENSUS BUREAU, PUBLIC ELEMENTARY AND SECONDARY EDUCATION, ARIZONA AS A PERCENTAGE OF THE NATIONAL AVERAGE



Source: U.S. Department of Commerce: Census Bureau, Public Education Finance.

TABLE 4
REVENUE PER STUDENT FROM THE NCES ADJUSTED FOR THE COST OF LIVING, PUBLIC ELEMENTARY AND SECONDARY EDUCATION, ARIZONA, FISCAL YEAR 2015

			Arizona		
	Nation	Arizona	Percent of Nation	Rank, 51 "States"	Rank, 10 Western States
Total Revenue	$12,873	$9,239	71.8%	49	8
Federal Revenue	1,093	1,197	109.5	24	3
State and Local Revenue	11,780	8,042	68.3	49	8
State	5,993	4,072	67.9	46	9
Local	5,787	3,971	68.6	39	5

Note: State revenue is limited to the 50 states.

Sources: U.S. Department of Education, National Center for Education Statistics (revenue and enrollment) and U.S. Department of Commerce, Bureau of Economic Analysis (regional price parity).

TABLE 5
CHANGE IN REVENUE PER STUDENT FROM THE NCES, PUBLIC ELEMENTARY AND SECONDARY EDUCATION, ARIZONA

	Change			Real Percent Change				
	Percent of Nation	Rank, 51 "States"	Rank, 10 Western States	Nation	Arizona	Difference	Rank, 51 "States"	Rank, 10 Western States
Fiscal Years 1993 through 2008								
Total Revenue	-7.7	-11	-2	49.1%	36.0%	-13.1	42	7
Federal Revenue	-6.9	-7	-1	74.8	63.9	-10.9	40	10
State and Local Revenue	-8.7	-10	-2	48.0	33.0	-15.0	44	7
State	6.1	1	1	57.3	69.5	12.2	19	3
Local	-25.2	-9	0	38.5	1.0	-37.5	45	9
Fiscal Years 2008 through 2015								
Total Revenue	-10.8	-3	0	-2.6	-15.8	-18.4	50	10
Federal Revenue	1.5	2	0	1.2	2.7	1.5	26	5
State and Local Revenue	-11.8	-5	0	-0.6	-15.7	-15.1	50	10
State	-20.1	-9	-3	-6.2	-28.3	-22.1	50	10
Local	-2.0	-5	-2	5.9	2.7	-3.2	36	7

Note: State revenue is limited to the 50 states.

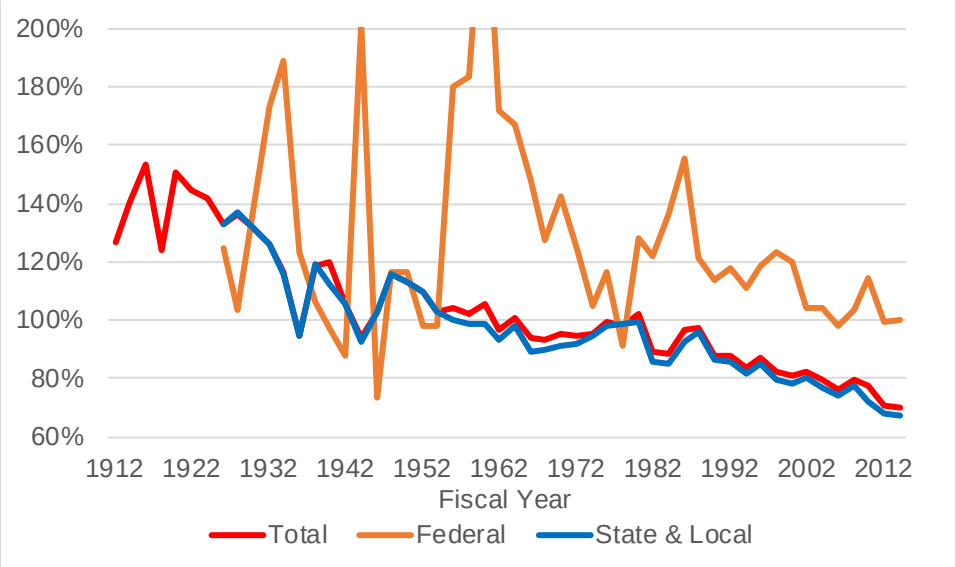
Source: U.S. Department of Education, National Center for Education Statistics (revenue and enrollment) and Bureau of Economic Analysis (gross domestic product implicit price deflator).

average using the Census Bureau's data than the data from the NCES. In the FY 1993-to-2008 period, differences between the two sources were larger for federal revenue per student, with the Census Bureau showing a larger decrease. Differences in state revenue per student and local revenue per student offset.

Both sources indicate that between fiscal years 1993 and 2008, the percent change in Arizona was among the bottom 10 states for both total revenue per student and state and local revenue per student. The decline in state and local revenue per student in Arizona relative to the nation was more rapid between FYs 2008 and 2015 than in the earlier period.

Per student revenue in Arizona relative to the U.S. average by source as reported by the NCES is displayed in Chart 5 for a period of more than a century. Federal revenue per student received by Arizona's schools has been quite erratic over time. Per student state and local revenue, as well as total revenue, have declined in Arizona relative to the nation from values much above average before the Great Depression. As recently as fiscal year 1988, per student total revenue and per student state and local revenue in Arizona were close to the national average. Since then, Arizona's revenue per pupil has declined substantially relative to the nation.

CHART 5
REVENUE PER STUDENT FROM THE NCES,
PUBLIC ELEMENTARY AND SECONDARY EDUCATION,
ARIZONA AS A PERCENTAGE OF THE NATIONAL AVERAGE



Note: Data are displayed only for even-numbered years. The federal value exceeded 200 percent in FY 1960.

Source: U.S. Department of Education, National Center for Education Statistics and predecessor agencies.

Expenditures
Total elementary and secondary expenditures are divided into three broad categories:

- Capital outlays, used for construction and the purchase of land, buildings, and major equipment.
- Current operations — by far the largest category — are split into three categories:
  - Instruction: salaries, employee benefits, supplies, materials, and contractual services related to instruction.
  - Support Services, which consists of seven subcategories:
    - Pupil Support: Attendance record-keeping, social work, student accounting, counseling, student appraisal, record maintenance, and placement services. This subcategory also includes medical, dental, nursing, psychological, and speech services.
    - Instructional Staff Support: Supervision of instruction service improvements, curriculum development, instructional staff training, and media, library, audiovisual, television, and computer–assisted instruction.
    - General Administration: Board of education and executive administration (office of the superintendent).
    - School Administration: Office of principal services.
    - Plant Operations and Maintenance: Building services (heating, electricity, air conditioning, property insurance), care and upkeep of grounds and equipment, nonstudent transportation vehicle operation and maintenance, and security services.
    - Pupil Transportation: transportation of public school students including vehicle operation, monitoring riders, and vehicle servicing and maintenance.
    - Other Support Services: Business support services and central support services, including payments for fiscal services, purchasing, warehousing, supply distribution, printing, duplicating services, planning, research, development, evaluation services, information services, and data processing.
  - Other Current Operations, which includes food services, community services, and adult education expenditures.
- Other Expenditures, which consist primarily of interest payments.

Census Bureau. Table 6 summarizes the fiscal year 2016 per student expenditure data from the Census Bureau, adjusted for the cost of living. Arizona's per student figures were substantially below the national average overall and in each of the three broad categories. Idaho and Utah were the only states that ranked lower on per student total expenditures and per student current operations.

In each subcategory of current operations, particularly instruction, Arizona was substantially below the national per student average in fiscal year 2016. Within support services, Arizona was not much below the U.S. per student average in pupil support but otherwise was considerably below average, particularly in the two classifications related to administration.

Another way of subdividing the expenditure data is to split current operations and its major categories into wages and salaries, benefits, and other expenditures, as seen in the bottom portion of Table 6. Again, Arizona was considerably below the U.S. per student average in each of these

TABLE 6
EXPENDITURES PER STUDENT FROM THE CENSUS BUREAU ADJUSTED FOR THE COST OF LIVING, PUBLIC ELEMENTARY AND SECONDARY EDUCATION, ARIZONA, FISCAL YEAR 2016

	Nation	Arizona	Arizona Percent of Nation	Arizona Rank, 51 "States"	Arizona Rank, 10 Western States
Total Expenditures	$13,685	$8,869	64.8%	49	8
Current Operations	12,085	8,082	66.9	49	8
Instruction	7,362	4,301	58.4	51	10
Support Services	4,107	3,236	78.8	46	7
Pupil Support	680	641	94.2	24	4
Instructional Staff Support	561	430	76.6	43	7
General Administration	226	141	62.2	40	5
School Administration	651	380	58.3	51	10
Plant Operations & Maintenance	1,057	960	90.8	37	2
Pupil Transportation	504	370	73.4	42	4
Other Support Services	428	315	73.5	33	8
Other Current Operations	617	545	88.4	38	3
Capital Outlays	1,177	587	49.9	46	8
Other Expenditures	423	200	47.3	39	10
Current Operations:					
Wages and Salaries	6,866	4,730	68.9	49	8
Benefits	2,806	1,509	53.8	50	9
Other Expenditures	2,413	1,844	76.4	41	5
Instruction:					
Wages and Salaries	4,603	2,940	63.9	50	9
Benefits	1,885	914	48.5	50	9
Other Expenditures	873	448	51.3	44	7
Support Services:					
Wages and Salaries	2,034	1,672	82.2	46	8
Benefits	837	554	66.2	44	7
Other Expenditures	1,236	1,009	81.6	41	5

Source: U.S. Department of Commerce: Census Bureau, Public Education Finance (expenditures and enrollment) and Bureau of Economic Analysis (regional price parity).

classifications. Since the wage, salary, and benefits expenditures are expressed on a per student basis, they cannot be used to infer how compensation of educational employees compares in Arizona to the rest of the nation. Arizona's low per student figures result from a high student-staff ratio as well as low wages, salaries, and benefits per staff member, as discussed later in this paper.

Inflation-adjusted percent changes in per student expenditures between fiscal years 1993 and 2008 and between FYs 2008 and 2016 are displayed in Table 7. Overall and in each of the three broad categories of expenditures, Arizona's expenditures per student declined relative to the national average. Within the current operations category, expenditures per student in Arizona dropped versus the national average in instruction and in support services. Varying changes

TABLE 7
CHANGE IN EXPENDITURES PER STUDENT FROM THE CENSUS BUREAU, PUBLIC ELEMENTARY AND SECONDARY EDUCATION, ARIZONA

	Change			Real Percent Change				
	Percent of Nation	Rank, 51 "States"	Rank, 10 Western States	Nation	Arizona	Difference	Rank, 51 "States"	Rank, 10 Western States
Fiscal Years 1993 through 2008								
Total Expenditures	-11.7	-12	-3	51.7%	32.2%	-19.5	47	9
Current Operations	-4.4	-6	-1	45.1	36.8	-8.3	38	7
Instruction	-5.6	-4	-1	44.3	33.4	-10.9	39	6
Support Services	-4.0	-8	-1	49.6	42.5	-7.1	38	6
Pupil Support	18.9	11	4	73.8	116.3	42.5	17	2
Instructional Staff Support	-30.2	-15	-4	86.6	14.3	-72.3	46	8
General Administration	-43.4	-20	-4	11.7	-37.8	-49.5	47	9
School Administration	-12.9	-11	-3	38.3	15.9	-22.4	50	10
Plant Operations & Maintenance	-18.5	-17	-3	39.1	15.8	-23.3	48	9
Pupil Transportation	16.2	5	4	51.3	90.4	39.1	6	1
Other Support Services	59.1	33	5	51.1	235.1	184.0	1	1
Other Current Operations	4.4	-7	0	27.0	33.9	6.9	32	8
Capital Outlays	-88.5	-12	-4	104.9	14.5	-90.4	47	9
Other Expenditures	-81.1	-6	-3	114.9	28.3	-86.6	41	8
Fiscal Years 2008 through 2016								
Total Expenditures	-17.0	-5	0	-0.9	-22.1	-21.2	49	9
Current Operations	-9.1	0	0	2.5	-10.2	-12.7	49	10
Instruction	-12.3	-2	-2	3.8	-14.9	-18.7	51	10
Support Services	-4.6	0	1	0.3	-5.5	-5.8	43	8
Pupil Support	-5.7	-3	-1	9.0	2.5	-6.5	36	7
Instructional Staff Support	25.8	10	3	-1.9	51.1	53.0	4	2
General Administration	5.1	5	2	4.6	14.4	9.8	11	2
School Administration	-10.9	-1	-1	2.2	-14.5	-16.7	51	10
Plant Operations & Maintenance	-4.1	-7	0	-6.3	-10.5	-4.2	45	7
Pupil Transportation	-8.1	-4	0	-2.1	-12.2	-10.1	45	9
Other Support Services	-37.2	-18	-3	6.5	-30.3	-36.8	50	10
Other Current Operations	1.5	3	1	1.5	3.3	1.8	25	5
Capital Outlays	-64.3	-30	-2	-26.3	-68.6	-42.3	49	9
Other Expenditures	-74.8	-31	-5	2.3	-61.4	-63.7	49	10

Source: U.S. Department of Commerce: Census Bureau, Public Education Finance (expenditures and enrollment) and Bureau of Economic Analysis (gross domestic product implicit price deflator).

within the support services category may reflect reporting changes in the subcategories of certain types of expenditures rather than actual spending trends. A review of the time series by subcategory suggests that expenses in some years have been classified differently than in other years in Arizona.

The annual pattern of per student expenditures in Arizona relative to the U.S. average are displayed in Charts 6 and 7. Per student current operations expenditures in Arizona have gradually dropped relative to the rest of the nation since fiscal year 1987, as seen in first graph of Chart 6. Arizona fell from 8 percent below average in FY 1987 to 36 percent below average in FY 2016. Per student capital outlays were more than 70 percent above the national average through FY 1996, but have since dropped to less than half of the U.S. average, as seen in the second graph of Chart 6.

Per student instructional expenditures in Arizona have declined substantially relative to the nation since the earliest data in fiscal year 1987, as seen in the first graph of Chart 7. In contrast, per student spending on support services relative to the nation dropped considerably for a few years after FY 1987, then stabilized, before falling further in recent years. Within the support services category, the two administrative subcategories are primarily responsible for the decline over time in per student support services relative to the nation, as seen in the second and third graphs of Chart 7. Reporting inconsistencies are particularly obvious in the student support and instructional staff support classifications.

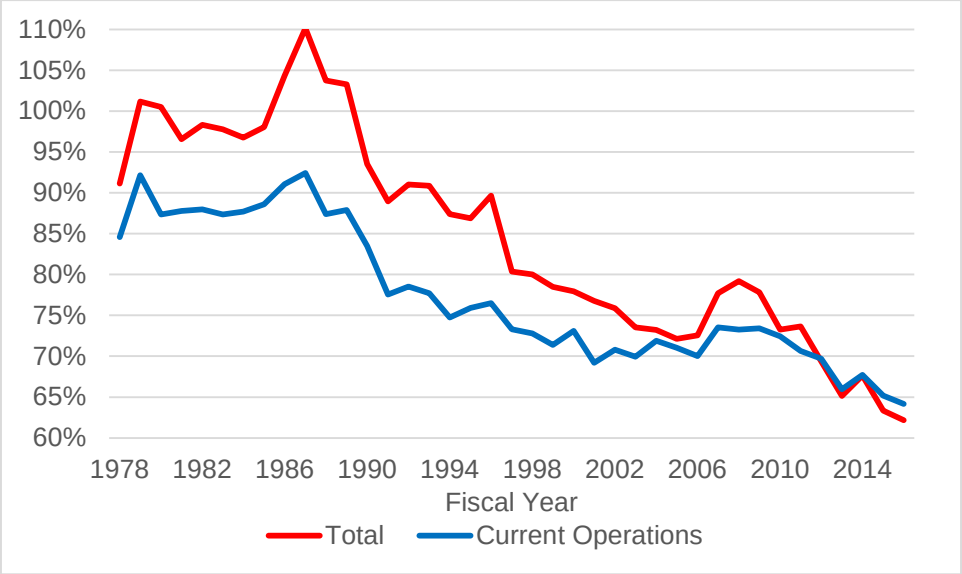
Spending on instruction as a share of total current operations spending was 53.2 percent in Arizona in fiscal year 2016, the lowest in the nation. The national average was 60.9 percent. Arizona's instructional share has historically been low, as seen in Chart 8.

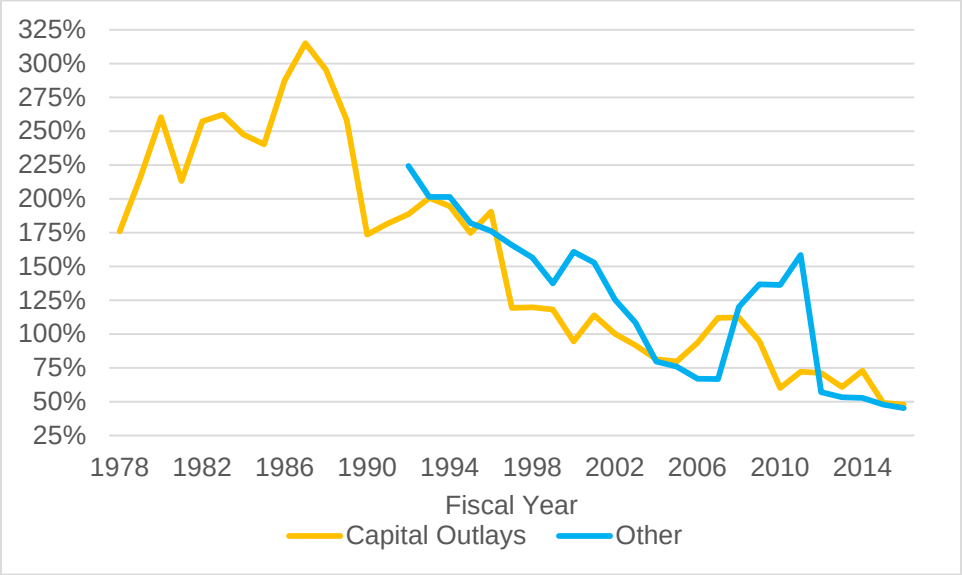
NCES. Expenditures of elementary and secondary schools by type of spending as reported by the NCES are available back to Arizona's statehood. Table 8 summarizes the fiscal year 2015 per student expenditure data adjusted for the cost of living. Though the NCES data in Table 8 are for FY 2015 and the Census Bureau data in Table 6 are for FY 2016, the ratio to the nation and the ranks generally are consistent by category. Overall expenditures and expenditures for current operations are lower on a per student basis only in Idaho and Utah than in Arizona.

A more direct comparison of the NCES and Census Bureau data for FY 2015 reveals some differences between the two series. In particular, the per student figures for capital outlays in Arizona are far apart, with the NCES reporting a considerably higher figure. In the current operations category, the Census Bureau reports somewhat higher spending, both nationally and in Arizona. However, in the support services category, the Census Bureau's figures are higher in some components but lower in others.

Per student expenditures in Arizona relative to the national average are similar from the two sources in the current operations category and in the instruction and support services categories, with Arizona far below the nation. Within support services, however, differences exist between the two sources in Arizona's percentage of the per student national average. The Census Bureau reports relatively more spending in Arizona than the NCES in pupil support and in instructional staff support, but relatively less spending in the two administration subcategories. However,

CHART 6
EXPENDITURES PER STUDENT FROM THE CENSUS BUREAU, TOTAL AND BROAD CATEGORIES, PUBLIC ELEMENTARY AND SECONDARY EDUCATION, ARIZONA AS A PERCENTAGE OF THE NATIONAL AVERAGE

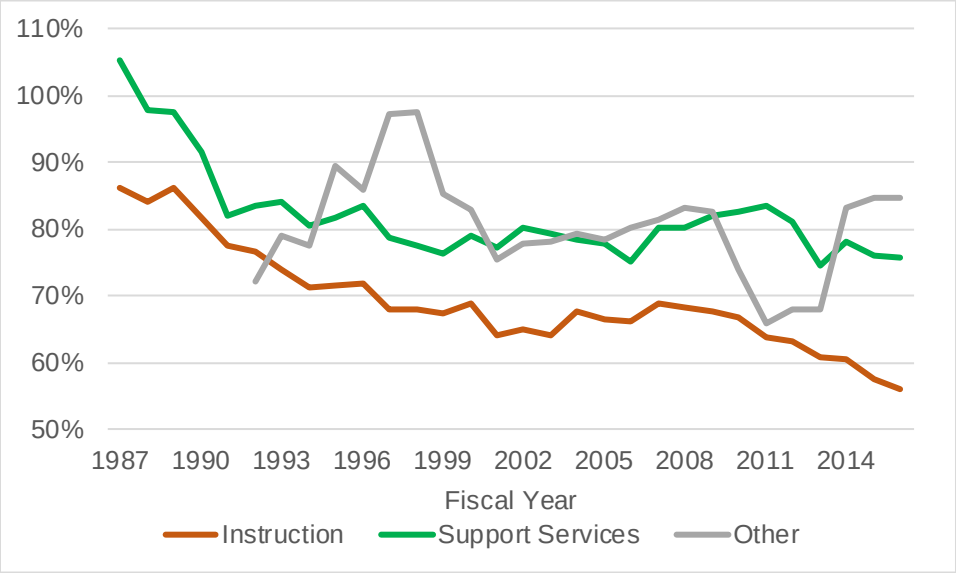




Source: U.S. Department of Commerce, Census Bureau, Public Education Finance.

CHART 7
EXPENDITURES PER STUDENT FROM THE CENSUS BUREAU, DETAILED CATEGORIES, PUBLIC ELEMENTARY AND SECONDARY EDUCATION, ARIZONA AS A PERCENTAGE OF THE NATIONAL AVERAGE

CURRENT OPERATIONS CATEGORIES



SUPPORT SERVICES SUBCATEGORIES, Part 1

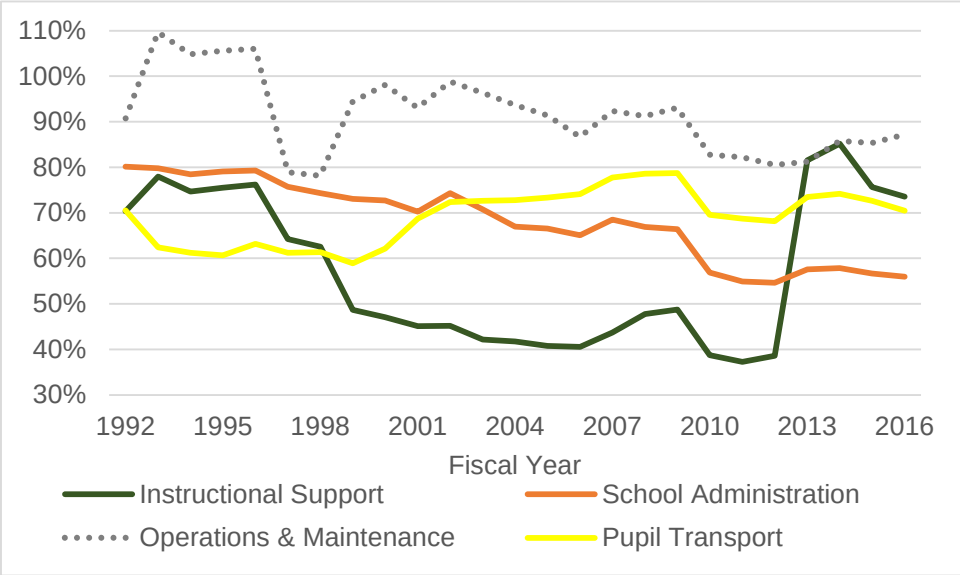


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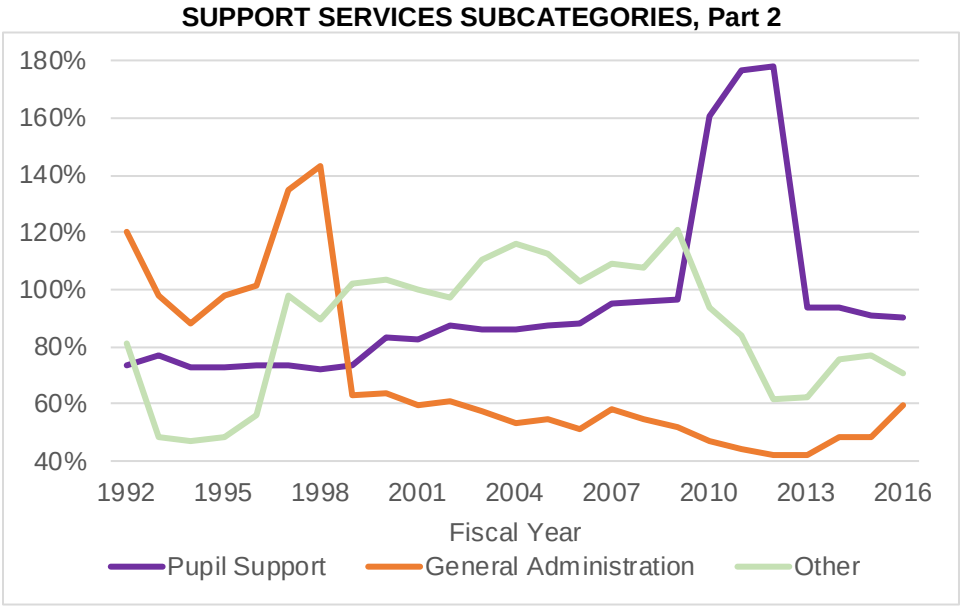
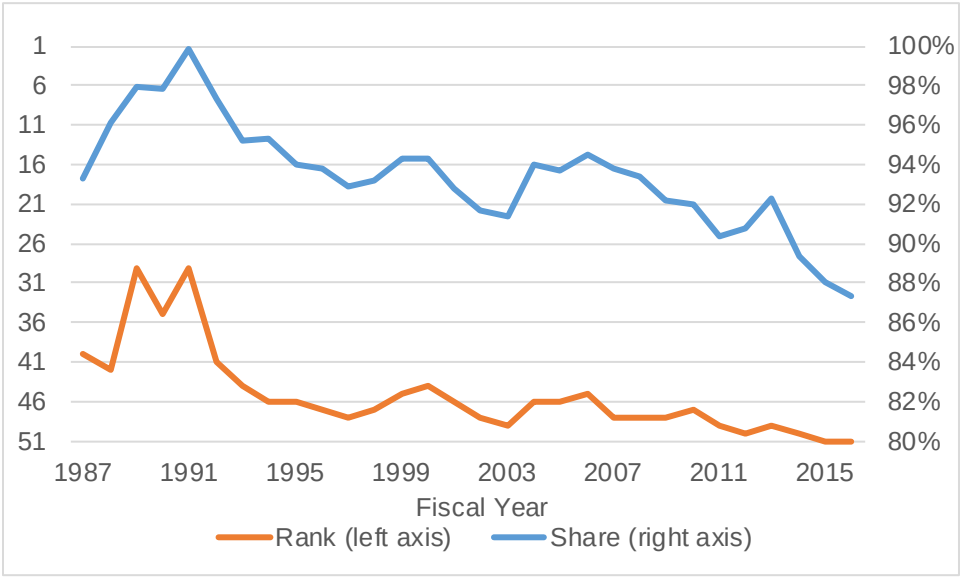
CHART 7 (continued)
EXPENDITURES PER STUDENT FROM THE CENSUS BUREAU, DETAILED CATEGORIES, PUBLIC ELEMENTARY AND SECONDARY EDUCATION, ARIZONA AS A PERCENTAGE OF THE NATIONAL AVERAGE



Source: U.S. Department of Commerce, Census Bureau, Public Education Finance.

CHART 8
INSTRUCTIONAL EXPENDITURES AS A SHARE OF CURRENT OPERATIONS EXPENDITURES FROM THE CENSUS BUREAU, PUBLIC ELEMENTARY AND SECONDARY EDUCATION, ARIZONA AS A PERCENTAGE OF THE NATIONAL AVERAGE



Source: U.S. Department of Commerce, Census Bureau, Public Education Finance.

TABLE 8
EXPENDITURES PER STUDENT FROM THE NCES ADJUSTED FOR THE COST OF LIVING, PUBLIC ELEMENTARY AND SECONDARY EDUCATION, ARIZONA, FISCAL YEAR 2015

	Nation	Arizona	Arizona Percent of Nation	Arizona Rank, 51 "States"	Arizona Rank, 10 Western States
Total Expenditures	$12,942	$9,064	70.0%	49	8
Current Operations	11,435	7,844	68.6	49	8
Instruction	6,946	4,205	60.5	51	10
Support Services	4,009	3,214	80.2	47	8
Pupil Support	643	582	90.4	32	4
Instructional Staff Support	536	400	74.7	42	6
General Administration	229	142	61.9	41	5
School Administration	632	425	67.2	51	10
Plant Operations & Maintenance	1,077	964	89.5	39	3
Pupil Transportation	476	343	72.1	43	4
Other Support Services	415	358	86.2	28	6
Other Current Operations	481	425	88.4	39	4
Capital Outlays	1,006	924	91.8	31	6
Other Expenditures	501	296	59.1	34	7
Instruction:					
Salaries	4,433	2,849	64.3	50	9
Benefits	1,766	859	48.6	50	9
Purchased Services	329	279	84.7	18	2
Supplies	279	187	66.9	47	9
Other	138	32	22.9	38	6

Sources: U.S. Department of Education, National Center for Education Statistics (expenditures and enrollment) and U.S. Department of Commerce, Bureau of Economic Analysis (regional price parity).

spending per pupil in Arizona was less than the national average in each subcategory according to each source.

Arizona was last in the nation in fiscal year 2015 in per student expenditures in the instruction category. The bottom portion of Table 8 provides a breakout of the instruction expenditures. Arizona's per student spending on instruction was less than the U.S. average in each of the five subcategories, though Arizona ranked above the median state in the purchased services subcategory. In the salaries subcomponent, only Utah had a lower per student figure; in the benefits subcategory, only Texas had a lower per student figure. As in the Census Bureau's dataset, instructional spending as a share of total current operations spending in Arizona was the lowest in the nation in FY 2015.

Inflation-adjusted percent changes in revenue between fiscal years 1993 and 2015 are displayed in Table 9. Arizona's real percent change was second lowest of the states for total expenditures per student (Nevada was lower) and third lowest for current operations spending per student (Nevada and Oregon were lower). Arizona ranked last in instruction expenditures per student.

TABLE 9
CHANGE IN EXPENDITURES PER STUDENT FROM THE NCES, PUBLIC ELEMENTARY AND SECONDARY EDUCATION, ARIZONA

	Change			Real Percent Change				
	Percent of Nation	Rank, 51 "States"	Rank, 10 Western States	Nation	Arizona	Difference	Rank, 51 "States"	Rank, 10 Western States
Fiscal Years 1993 through 2008								
Total Expenditures	-11.3	-12	-2	49.1%	30.6%	-18.5	46	8
Current Operations	-4.1	-4	-1	44.8	37.3	-7.5	39	7
Instruction	-5.9	-4	-1	44.2	32.9	-11.3	41	6
Support Services	-0.7	-6	0	48.2	47.1	-1.1	32	6
Pupil Support	74.3	24	6	77.8	255.5	177.7	2	1
Instructional Staff Support	-26.4	-9	-2	73.3	3.6	-69.7	46	8
General Administration	-68.2	-28	-6	6.4	-50.8	-57.2	48	9
School Administration	-10.6	-7	-2	40.0	20.1	-19.9	49	10
Plant Operations & Maintenance	-3.1	-5	0	36.5	31.8	-4.7	36	7
Pupil Transportation	-5.1	-5	0	46.9	36.6	-10.3	39	7
Other Support Services	0.6	-2	0	65.9	66.9	1.0	38	8
Other Current Operations	-5.0	-12	-1	27.8	21.3	-6.5	39	9
Capital Outlays	-88.3	-13	-4	89.1	5.0	-84.1	48	10
Other Expenditures	-22.5	-3	-2	54.4	25.7	-28.7	35	8
Instruction:								
Salaries	-10.8	-12	-2	31.7	14.9	-16.8	43	7
Benefits	-0.8	-2	0	67.7	65.4	-2.3	32	3
Purchased Services	61.0	25	4	130.3	690.6	560.3	4	1
Supplies	23.0	2	0	76.7	187.7	111.0	6	2
Other	12.0	2	0	166.2	198.3	32.1	15	4

(continued)

TABLE 9 (continued)
CHANGE IN EXPENDITURES PER STUDENT FROM THE NCES, PUBLIC ELEMENTARY AND SECONDARY EDUCATION, ARIZONA

	Change			Real Percent Change				
	Percent of Nation	Rank, 51 "States"	Rank, 10 Western States	Nation	Arizona	Difference	Rank, 51 "States"	Rank, 10 Western States
Fiscal Years 2008 through 2015								
Total Expenditures	-12.8	-4	0	-4.1%	-19.4%	-15.3	49	9
Current Operations	-9.3	-2	0	-0.2	-12.5	-12.3	51	10
Instruction	-11.8	-2	-2	-0.3	-17.1	-16.8	51	10
Support Services	-5.2	-1	-1	-0.5	-6.9	-6.4	44	8
Pupil Support	-61.8	-21	-3	3.5	-39.5	-43.0	51	10
Instructional Staff Support	32.5	6	3	-6.5	70.6	77.1	1	1
General Administration	0.9	3	2	2.8	4.4	1.6	25	2
School Administration	0.5	0	0	-1.3	-0.5	0.8	33	5
Plant Operations & Maintenance	0.9	-1	1	-3.4	-2.4	1.0	25	4
Pupil Transportation	0.8	-1	2	-2.1	-1.0	1.1	30	2
Other Support Services	-10.7	-4	-1	12.6	-0.2	-12.8	36	8
Other Current Operations	-7.9	-6	-1	4.4	-4.5	-8.9	47	10
Capital Outlays	-21.9	-18	-1	-33.0	-46.3	-13.3	45	8
Other Expenditures	-41.8	-19	-2	-7.7	-46.8	-39.1	49	10
Instruction:								
Salaries	-12.7	-1	-1	-5.1	-21.3	-16.2	51	10
Benefits	-5.3	0	0	12.8	1.2	-11.6	40	7
Purchased Services	-4.8	2	1	18.9	12.3	-6.6	27	3
Supplies	4.5	2	1	-12.6	-6.0	6.6	14	1
Other	-89.7	-23	-4	3.9	-79.5	-83.4	49	10

Sources: U.S. Department of Education, National Center for Education Statistics (expenditures and enrollment) and Bureau of Economic Analysis (gross domestic product implicit price deflator).

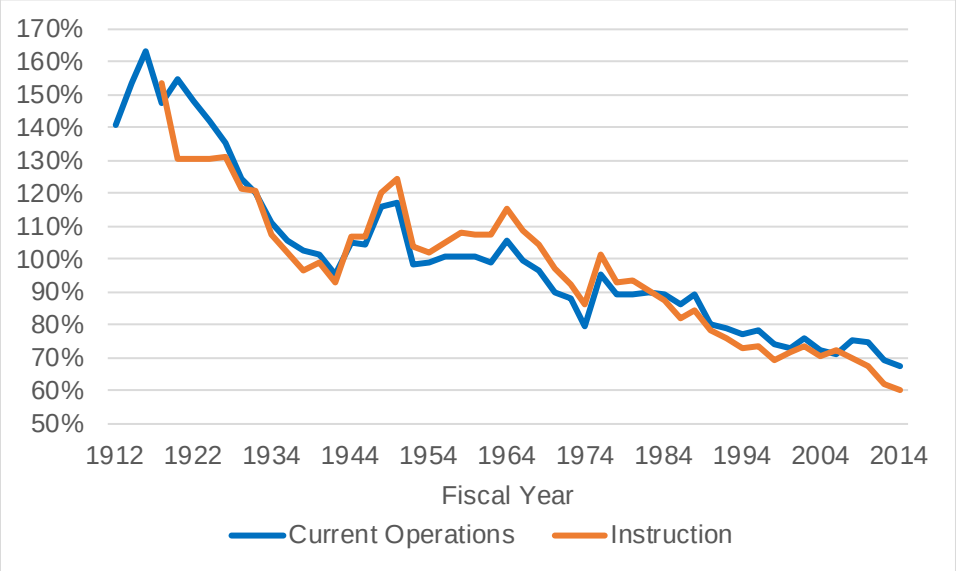
A comparison between the data from the NCES and the Census Bureau of the changes in expenditures per student between fiscal years 1993 and 2008 and between FYs 2008 and 2015 shows strong concordance in total expenditures, current operations, and instruction. However, within the support services subcategory, the differences between the two sources are significant. Large differences also are present in the capital outlays and other expenditures categories.

Per student expenditures for current operations and for instruction in Arizona relative to the U.S. average, as reported by the NCES, are displayed in Chart 9 for a period of more than a century. The two series are similar, with each falling from considerably above the national average in the early years of statehood to about the U.S. average by the late 1930s. Arizona remained near the national average into the 1960s. Since then, Arizona's per pupil spending on current operations and instruction has dropped substantially relative to the national average.

Teachers and Other Staff

The NCES has reported the number of employees of the public elementary and secondary educational system in each of 11 occupational categories since the fall of 1993; data go back further for some of these categories. Unfortunately, a number of instances of either inaccurate data or a change in how a state reports the data by occupational category are obvious. For example, in several categories, Arizona's number of employees since fall 2012 have been inconsistent with earlier data.

CHART 9
EXPENDITURES PER STUDENT FROM THE NCES,
PUBLIC ELEMENTARY AND SECONDARY EDUCATION,
ARIZONA AS A PERCENTAGE OF THE NATIONAL AVERAGE



Note: Data are displayed only for even-numbered years.

Source: U.S. Department of Education, National Center for Education Statistics and predecessor agencies.

The number of students to staff by occupational category in fall 2015 is displayed in Table 10. Arizona's ranks and percent of the national average are calculated based on the number of staff per student. The total number of staff to the number of students in Arizona was 26.5 percent below the national average, ranking 46th. Arizona ranked among the bottom 10 states in seven of the 11 occupational categories and was less than the U.S. average in every category except student support.

The number of teachers as a share of the total number of employees is shown in Chart 10. From fiscal years 1989 through 2005, the share in Arizona was 1-to-5 percent below the national average. Between FYs 2006 and 2012, the share in Arizona varied from equal to the U.S. average to 3.5 percent higher, but since then, the share in Arizona has been from 6-to-7 percent below average. In fall 2015, Arizona's share ranked 38th among all states and seventh among the 10 western states, with California, Colorado, and Oregon lower.

Teacher Qualifications

The NCES periodically conducted a Schools and Staffing Survey, an integrated study of school districts, schools, principals, and teachers. Data by state are available for fiscal years 1994, 2000, 2004, 2008, and 2012. Among the topics in this survey was teacher qualifications, based on the educational attainment of the teachers and the number of years of teaching experience.

In fiscal years 1994, 2000, and 2004, the educational attainment of Arizona's teachers was similar to the U.S. average. In FY 2008, Arizona was a little below average, with higher-than-average shares without a bachelor's degree and with a bachelor's degree and a below-average

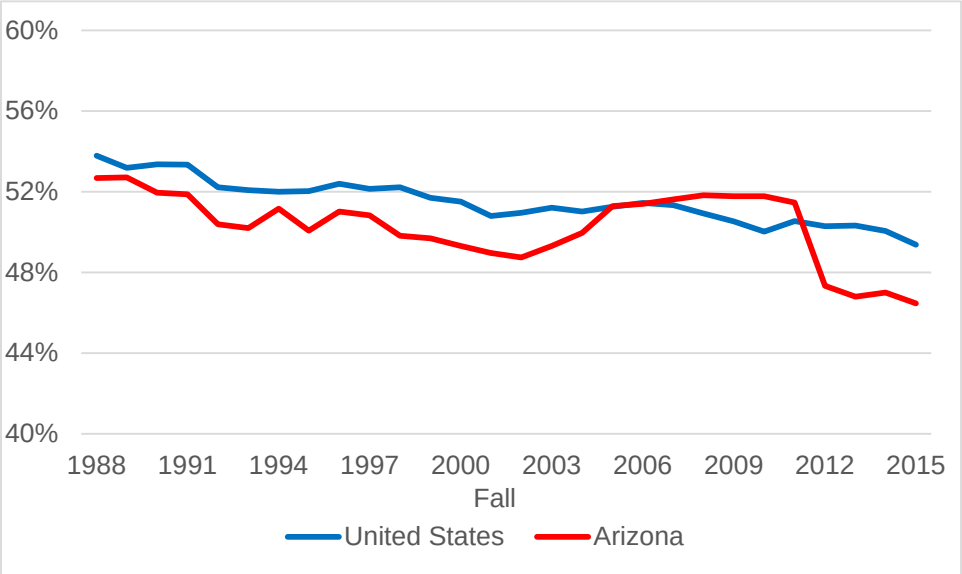
TABLE 10
NUMBER OF STAFF AND NUMBER OF STUDENTS, PUBLIC ELEMENTARY AND SECONDARY EDUCATION, ARIZONA, FISCAL YEAR 2015

	Number of Students Per Staff		Number of Staff Per Student, Arizona		
	Nation	Arizona	Percent of Nation	Rank, 51 "States"*	Rank, 10 Western States
Total	7.9	10.8	73.5%	46	5
Administrative Support	264.5	266.7	99.2	25	4
Administrators	744.2	800.5	93.0	30	2
Guidance Counselors	465.4	903.1	51.5	51	10
Instructional Aides	66.0	73.4	89.9	38	5
Instructional Coordinators	576.5	1,777.6	32.4	45	9
Librarians	1,163.0	2,490.6	46.7	46	6
Principals & Assistant Principals	277.1	450.6	61.5	50	9
School and Library Support	180.7	286.1	63.2	44	9
Student Support	148.8	94.9	156.8	10	1
Teachers	16.0	23.1	69.2	50	9
Other Support	43.1	77.8	55.5	44	7

* In some of the staff categories, employment is zero in one or more states.

Source: U.S. Department of Education, National Center for Education Statistics.

CHART 10
NUMBER OF TEACHERS AS A SHARE OF THE TOTAL NUMBER OF STAFF, PUBLIC ELEMENTARY AND SECONDARY EDUCATION



Source: U.S. Department of Education, National Center for Education Statistics.

share with a master's degree. Arizona was further below average in FY 2012, with 51.0 percent having a master's or more advanced degree compared to 56.4 percent nationally.

The teaching experience of Arizona's teachers was less than the national average in fiscal years 1994 and 2000, with a considerably lesser proportion in Arizona having taught for at least 20 years. The differential widened after this, with Arizona having a substantially lower proportion with at least 10 years of experience, and a substantially greater share with less than three years of experience. The proportion with less than three years of experience was the highest in the nation in FYs 2008 and 2012, while Arizona ranked in the mid-40s on the share with at least 10 years of experience.

Additional information was collected in fiscal year 2012, focusing on relatively new teachers. Arizona ranked 40th on the share who were certified and fourth on the percentage of teachers who were in their first or second year of teaching — 14 percent compared to 10 percent nationally. Only Alaska, the District of Columbia, and Florida had higher shares of new teachers.

Instructional Salaries

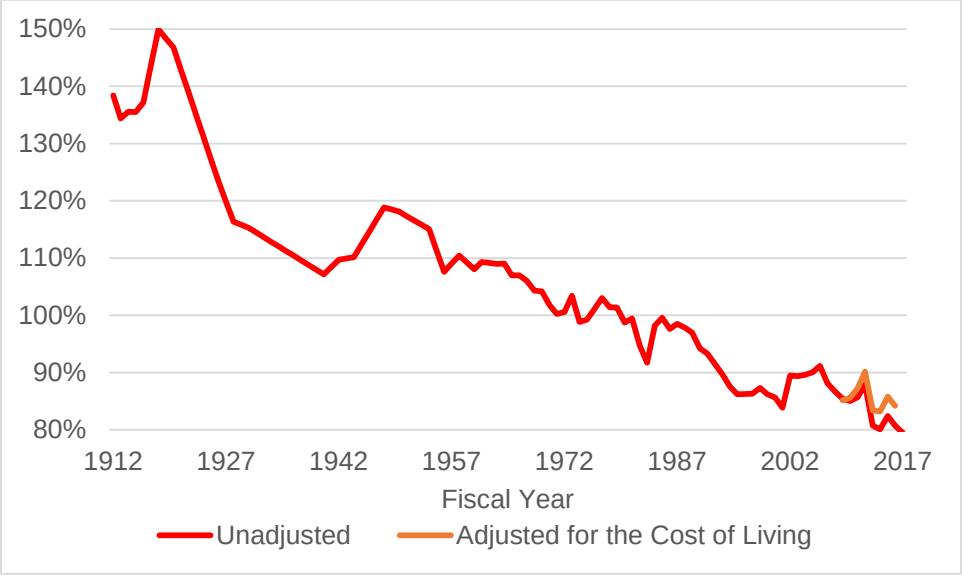
Historically, information on instructional salaries by state were reported by the predecessors of the NCES. In addition to teachers, instructional staff include principals, guidance personnel, librarians, etc. During the 1970s, the NCES stopped collecting data on salaries and instead reported data from the National Education Association (NEA), which reports salaries for both instructional staff and teachers specifically. Like the data from the NCES, the NEA's data are subject to misreporting and nonreporting by state educational agencies. An examination of the data indeed raises questions regarding its accuracy.

Instructional staff salaries in Arizona were far above the national average in the early years of Arizona's statehood, as seen in Chart 11. After that, the differential narrowed but the average in Arizona remained above the national average through the 1960s. By the early 1990s, Arizona's average was more than 10 percent below the national average. Since fiscal year 2014, Arizona's average has been 20 percent less than the U.S. average. After adjusting for the cost of living, the differential has been approximately 16 percent in recent years, with Arizona ranking among the bottom five states.

Another source of salary information is the Schools and Staffing Survey that was conducted by the NCES. Salaries were expressed in two ways: as the average base salary of teachers with a bachelor's degree as their highest attainment and the average base salary of teachers with a master's degree as their highest attainment.

Not adjusting for the cost of living, teacher salaries in Arizona in fiscal year 1994 were below the national average — the base for a bachelor's degree was 7.0 percent below average (but ranked 26th among the states) and the base for a master's degree was 8.3 percent below average (but ranked 25th). Salaries in Arizona fell substantially between FYs 1994 and 2012 relative to the nation. Over these 18 years, salaries rose modestly nationally after adjustment for inflation, but real salaries in Arizona fell. Arizona ranked 44th of 46 states — salary information is not available for five states in FY 2012 — on the percent change between FYs 1994 and 2012 in average base salary for teachers with a bachelor's degree and last for teachers with a master's degree. Adjusting for the cost of living, the average base salary in Arizona in FY 2012 was the lowest of the 46 states at 18.2 percent below the U.S. average for those with a bachelor's degree and 24.5 percent below average for those with a master's degree.

CHART 11
AVERAGE INSTRUCTIONAL SALARY, PUBLIC ELEMENTARY AND SECONDARY EDUCATION, ARIZONA AS A PERCENTAGE OF THE NATIONAL AVERAGE



Sources: U.S. Department of Education, National Center for Education Statistics, and National Education Association.

Classroom Size

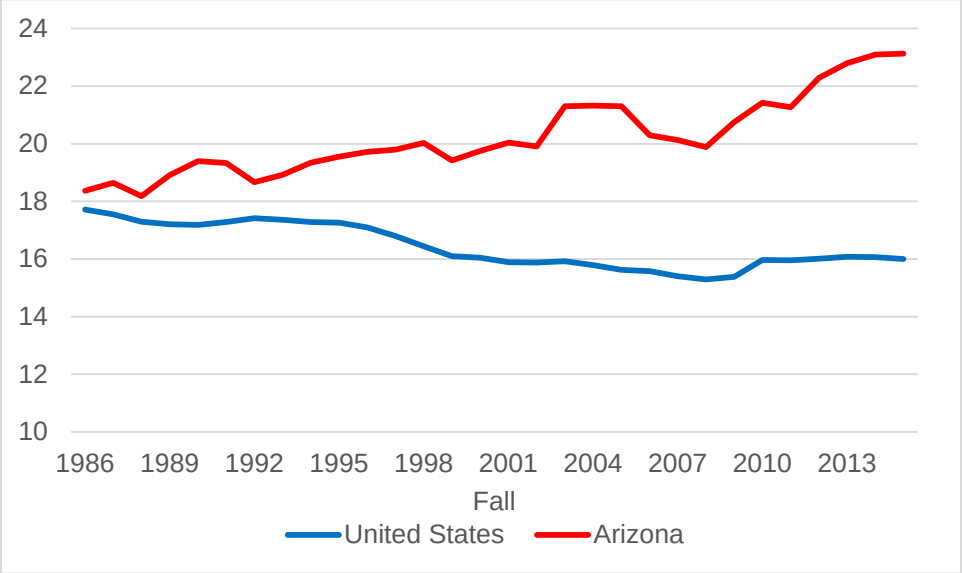
The NCES reports average classroom size in two ways: the number of students divided by the number of teachers and the number of students divided by the number of staff. These annual data go back to the late 1980s, when the number of students per teacher/staff in Arizona was only a little above the national average, though the number of students per teacher in Arizona was among the 10 highest in the nation. Since then, the number of students per teacher/staff has increased in Arizona while the national average has dropped a little (see Chart 12).

Since fall 2003, Arizona has had the second or third highest number of students per teacher in every year, with California and/or Utah generally having a higher figure. On the number of students per staff, Arizona has had between the third- and seventh-highest figure in each year since fall 2001.

In Chart 13, Arizona is compared to the nation over time in the inverse measures of the number of teachers or staff per student. A substantial decline relative to the national average has occurred in each measure.

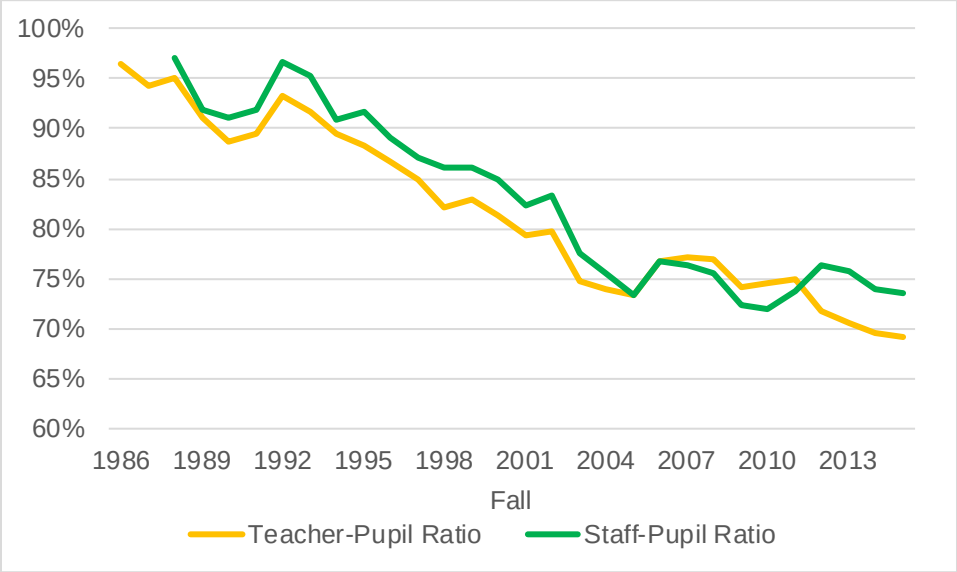
Based on the Schools and Staffing Survey, average classroom size is available for elementary schools separate from high schools. Arizona's average size was greater than the national average in each survey year for both elementary and secondary schools, with the differential from the nation greater for elementary schools.

CHART 12
NUMBER OF STUDENTS PER TEACHER,
PUBLIC ELEMENTARY AND SECONDARY EDUCATION



Source: U.S. Department of Education, National Center for Education Statistics.

CHART 13
NUMBER OF EMPLOYEES PER STUDENT,
PUBLIC ELEMENTARY AND SECONDARY EDUCATION,
ARIZONA AS A PERCENTAGE OF THE NATIONAL AVERAGE



Source: U.S. Department of Education, National Center for Education Statistics.

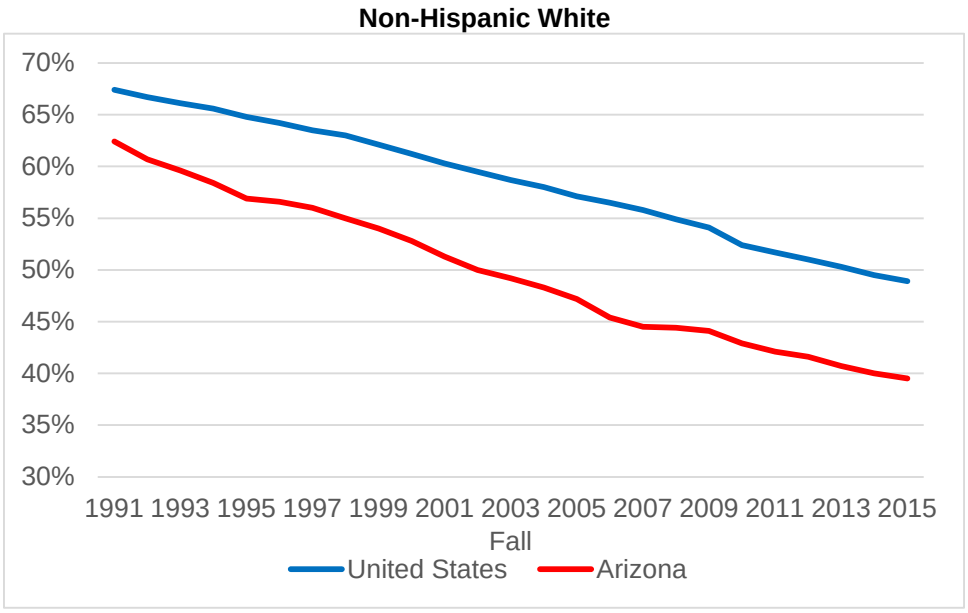
Student Demographics

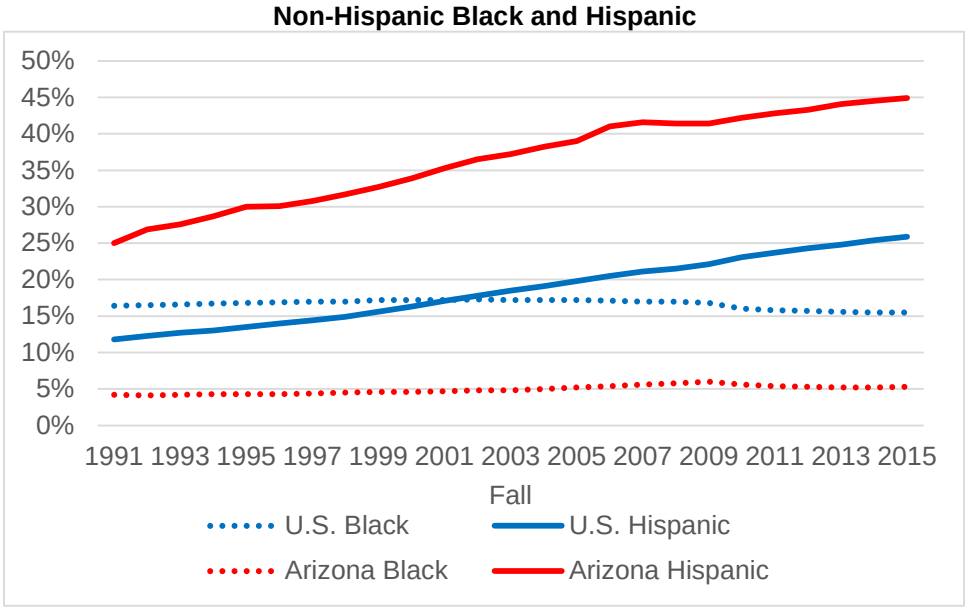
The share of public school students who are non-Hispanic whites has been steadily falling nationally and in Arizona, as seen in the first graph of Chart 14. The share in Arizona has been less than in the nation and has fallen a little faster. The share of students who are non-Hispanic blacks has been relatively steady in both Arizona and the nation, but the share in Arizona has been considerably less than in the nation. In contrast, the Hispanic share has increased substantially in Arizona and in the nation; it surpassed the non-Hispanic black share nationally in fall 2002. The Hispanic share is considerably higher in Arizona than in the nation, as seen in the second graph of Chart 14. The third graph of Chart 14 shows the shares nationally and in Arizona of non-Hispanic Asians and Pacific Islanders and of non-Hispanic Native Americans.

According to the Arizona Department of Education, the racial/ethnic distribution in fall 2016 of public elementary and secondary school students in Arizona was 45.3 percent Hispanic, 38.7 percent non-Hispanic white, 5.3 percent non-Hispanic black, 4.6 percent non-Hispanic Native American, 3.3 percent non-Hispanic Asian or Pacific Islander, and 2.9 percent non-Hispanic of two or more races.

Children from low-income or otherwise disadvantaged households tend to reach school age with a lesser grasp of fundamentals. Without adequate assistance to overcome this liability, these children are at an above-average risk of experiencing subpar educational achievement and attainment in the coming years.

CHART 14
RACE/ETHNICITY OF STUDENTS,
PUBLIC ELEMENTARY AND SECONDARY EDUCATION

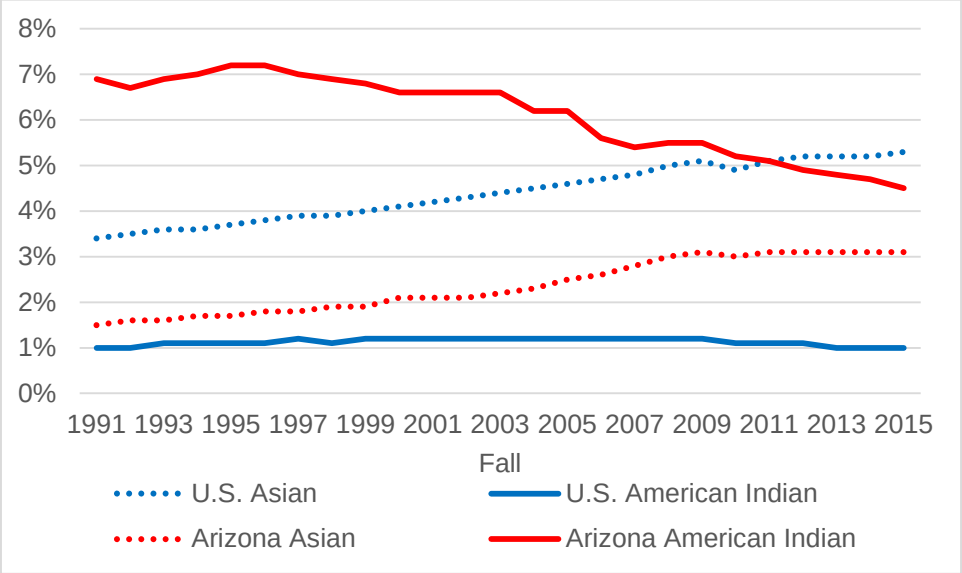




(continued)

CHART 14 (continued)
RACE/ETHNICITY OF STUDENTS,
PUBLIC ELEMENTARY AND SECONDARY EDUCATION

Non-Hispanic Asian and Pacific Islander and Non-Hispanic American Indian



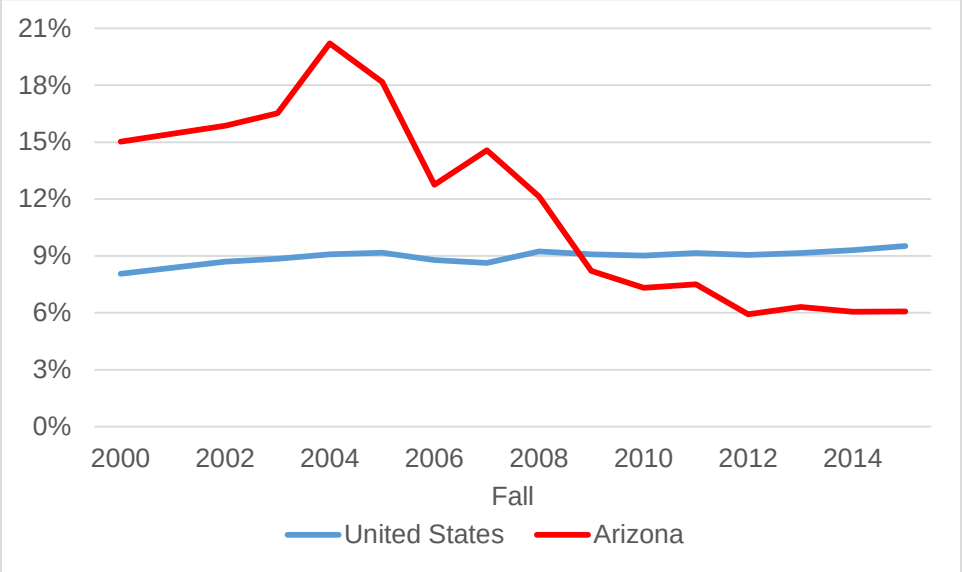
Source: U.S. Department of Education, National Center for Education Statistics.

One way of gauging the size of this disadvantaged population is the percentage of students eligible for the free and reduced-price lunch (FRPL) program. This program is a federal initiative that provides free or inexpensive lunches to children from low-income families. Students must demonstrate eligibility to participate, and schools receive cash subsidies from the U.S. Department of Agriculture to pay for the food. The FRPL data are used to determine funding for various other federal and state programs targeted to students from low-income families. Despite the importance of the data, its accuracy has been questioned, with some states and school districts either not reporting the data or not reporting it correctly.

Nationally, the proportion of public school students eligible for the free and reduced-price lunch program has increased to 52 percent in fiscal year 2015, based on data from the NCES. It had been 38 percent in FY 2001 and 43 percent just prior to the onset of the 2008-09 recession. The figures for Arizona are erratic from year to year, with the state ranging from above-to-below the national average and the rank ranging from 10th to 36th over the last decade. This variability almost certainly reflects reporting error and makes it impossible to compare Arizona to other states on this measure.

Another common student measure is the percentage of public school students participating in English language learner (ELL) programs. Nationally, this proportion has increased slightly from 8.1 percent in fall 2000 to 9.5 percent in fall 2015. In contrast, the share in Arizona has fallen substantially since the peak in fall 2004 (see Chart 15). Through fall 2005, the proportion was considerably higher in Arizona than the national average, primarily due to the large number of unauthorized immigrants settling in Arizona. Two factors account for much of the decline in the

CHART 15
PERCENTAGE OF STUDENTS PARTICIPATING IN ENGLISH LANGUAGE LEARNER PROGRAMS, PUBLIC ELEMENTARY AND SECONDARY EDUCATION



Source: U.S. Department of Education, National Center for Education Statistics.

share in Arizona relative to the nation since 2007:

- Arizona's employer sanctions law, passed in 2007, caused many unauthorized immigrants to leave the state.
- The recession that began at the end of 2007 was deeper and longer in Arizona than in most of the nation, resulting in a number of relatively recent immigrants (legal and unauthorized) leaving the state.

Test Scores

Students take a number of achievement tests, but each test has its shortcomings. Comprehensive testing administered by the State of Arizona cannot be used to compare Arizona to other states, since the tests used are unique to Arizona. Comparisons to test results in Arizona in previous years are limited by changes in the test instrument.[3] Two other types of tests that conceptually can be compared over time and across states are discussed in this subsection.

National Assessment of Educational Progress (NAEP)

Also known as "The Nation's Report Card," the NAEP is the only assessment of student learning by subject that is comparable across the states. The test is given to a representative sample of public school students across the country, but the sample size by state is rather small. Thus, sampling error is a significant issue in comparing states or in comparing scores in a given state over time. In Arizona for example, the math test in 2017 was administered to only 2,300 fourth

[3] Historically, tests such as the Stanford Achievement Test, whose results could be compared to other states administering the test, were used in Arizona. Several years ago, Arizona switched to its own AIMS (Arizona's Instrument to Measure Standards) test. More recently, the AIMS test was replaced by AzMERIT for the subjects of reading, writing, and mathematics.

graders in 120 schools and to 2,300 eighth graders in 110 schools. Less than 3 percent of all students in each grade were tested.

By state, results are available only for public school students in the fourth and eighth grades. In the subjects of reading and mathematics, results are available by state back to the early 1990s. From 2003 through 2017, these tests were administered in odd-numbered years; prior to that, the tests were given irregularly. A test also is given in science, but state-level scores are available infrequently, with the earliest results for 2000 and the latest for 2015. Results by state for the writing test are quite limited, with the most recent data for 2007.

The results of the NAEP test commonly are expressed in two ways: as an average score and as the percentage of students reaching achievement levels of basic, proficient, and advanced. The possible scores range from zero to 500 in the mathematics and reading tests and from zero to 300 in the science and writing tests.

Recent Test Results. The latest results of all students who took the NAEP tests for reading, mathematics, and science are provided in Table 11 for Arizona and the nation. In each test except the eighth grade math test, Arizona's overall average score was significantly less than the national average. Arizona's rank among the 50 states and the District of Columbia on the reading and math tests ranged from 25th (eighth grade math) to 42nd (fourth grade reading). Only 46 states participated in the latest science test in 2015; Arizona ranked 40th among fourth grade students and 41st among eighth grade students. States that consistently scored lower than Arizona on the various tests include Alaska, California, Louisiana, and New Mexico, as well as the District of Columbia. States that scored below Arizona on more than half of the six tests (two grades in each of three subjects) include Alabama, Hawaii, Mississippi, and Nevada.

In the fourth grade tests, the average scores of Arizona students at the low end of the achievement scale — e.g. the 10th percentile — were further below the national average than the average scores of Arizona students at the high end of the achievement scale (see Table 11). This pattern was reversed in the eighth grade tests.

In addition to the statistics of all test takers, the NCES provides test results for various population groups. Scores have been consistently produced by the NCES by test over time for racial and ethnic groups and by gender, though the results are withheld if sampling error is especially large in a particular group. Scores are available erratically by test and over time based on the following characteristics:

- Eligibility for free and reduced price lunch.
- Disability status.
- English language proficiency.
- Maximum educational attainment of parents: not a high school graduate, high school graduate, some college, college degree.

Sampling error for these population groups is greater than for the state total, substantially so for groups with small numbers of test takers. In Arizona in 2017, the sample sizes for the mathematics test in the fourth and eighth grades were less than 120 for non-Hispanic blacks, non-Hispanic Asians and Pacific Islanders, non-Hispanic Native Americans, and non-Hispanic

TABLE 11
RECENT ACHIEVEMENT TEST RESULTS, ALL TEST TAKERS, PUBLIC ELEMENTARY AND SECONDARY EDUCATION

	Fourth Grade			Eighth Grade		
	Nation	Arizona	Differ*	Nation	Arizona	Differ*
Reading, 2017						
Average Score	221	215	-6	265	263	-2
Percentile Score:						
10th	169	162	-7	218	219	1
25th	198	190	-8	243	243	0
50th	225	219	-6	268	265	-3
75th	248	243	-5	290	286	-4
90th	266	263	-3	309	304	-5
Achievement Level:						
Below Basic	33%	39%	6	25%	25%	0
Basic	31	31	0	41	44	3
Proficient	27	23	-4	31	28	-3
Advanced	9	7	-2	4	2	-2
Math, 2017						
Average Score	239	234	-5	282	282	0
Percentile Score:						
10th	197	191	-6	232	233	1
25th	219	212	-7	255	257	2
50th	241	235	-6	282	283	1
75th	261	257	-4	309	309	0
90th	279	276	-3	332	331	-1
Achievement Level:						
Below Basic	21%	27%	6	31%	29%	-2
Basic	39	39	0	36	37	1
Proficient	32	27	-5	24	24	0
Advanced	8	7	-1	10	9	-1
Science, 2015						
Average Score	153	149	-4	153	148	-5
Percentile Score:						
10th	107	101	-6	107	105	-2
25th	131	126	-5	132	127	-5
50th	156	152	-4	156	150	-6
75th	177	174	-3	177	170	-7
90th	195	192	-3	194	187	-7
Achievement Level:						
Below Basic	25%	29%	4	33%	39%	6
Basic	39	38	-1	34	36	2
Proficient	36	32	-4	31	24	-7
Advanced	1	1	0	2	1	-1

Note: Percentages may not add to 100 due to rounding by the NCES. Possible scores range from zero to 500 for mathematics and reading, and from zero to 300 for science.

* Differ: Difference, Arizona minus the nation.

Source: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress.

individuals of two or more races. Such small samples equate to large sampling error; results generally have been withheld for Arizona for those of multiple races. Thus, caution is required in interpreting the results shown in Table 12.

Nationally, females score higher than males on the reading tests, with little difference between the sexes on the math and science tests. Arizona's test score differences from the nation are similar by sex, except that males did relatively better on the eighth grade math test.

Significant differences in test scores are seen by racial/ethnic group. Nationally, non-Hispanic Asians and Pacific Islanders score highest on the reading and math tests, followed by non-Hispanic whites. These two groups have similar scores on the science tests. Non-Hispanic blacks generally post the lowest scores. The scores of Hispanics and non-Hispanic Native Americans also are considerably below the overall average. In Arizona, non-Hispanic whites and non-Hispanic Asians/Pacific Islanders posted scores similar to their national counterparts. Compared to their national counterparts, non-Hispanic blacks scored higher, Hispanics scored slightly lower, and non-Hispanic Native Americans scored significantly lower in Arizona.

The national scores of students eligible for free and reduced price lunch (FRPL) are significantly lower than those of students not eligible for this program. Though results are erratic by test (subject and grade), Arizonans on average score lower than their national counterparts regardless of their status in the FRPL program.

Students with a disability score significantly below the overall average nationally. Though results are erratic by test, Arizonans on average score lower than their national counterparts regardless of their disability status.

Student scores vary with the educational attainment of their parents. Those students whose parents have no more than a high school diploma score significantly below average, those whose parents have attended college without graduating have scores near the overall average, and students whose parents are college graduates score above average. With parental educational attainment only reported for the three eighth grade tests, and with the results erratic in Arizona on these three tests, it is not possible to conclude how parental educational attainment of Arizona students affects the state's test scores relative to the nation.

For the reading tests in 2017, the NCES reported the proportion of test takers by race/ethnicity and by FRPL status. In the fourth grade reading test, Arizona's overall score was 6 points less than the national average. However, if the racial/ethnic composition of Arizona's test takers had been equal to the national average, the state's overall score would have been nearly equal to the U.S. average. Similarly, the differential from the national average would have been significantly narrowed if the FRPL status of Arizona's test takers had matched the national average. In the eighth grade reading test, Arizona's overall score was 2 points less than the national average. However, if the racial/ethnic composition of Arizona's test takers had been equal to the national average, the state's overall score would have been equal to the U.S. average. The differential from the national average would have narrowed slightly if the FRPL status of Arizona's test takers had matched the national average. Thus, the demographic makeup of Arizona's test takers contributes considerably to Arizona's subpar overall test scores.

TABLE 12
RECENT ACHIEVEMENT TEST RESULTS, AVERAGE TEST SCORE BY POPULATION GROUP, PUBLIC ELEMENTARY AND SECONDARY EDUCATION

	Fourth Grade			Eighth Grade		
	Nation	Arizona	Differ*	Nation	Arizona	Differ*
Reading, 2017						
All Test Takers	221	215	-6	265	263	-2
Sex:						
Male	218	213	-5	260	258	-2
Female	224	218	-6	270	268	-2
Race/Ethnicity:**						
White	231	232	1	274	274	0
Black	205	206	1	248	254	6
Hispanic	208	204	-4	255	254	-1
Asian/Pacific Islander	238	240	2	281	277	-4
Native American	203	186	-17	253	254	1^
FRPL:***						
Eligible	208	203	-5	253	254	1
Not Eligible	236	237	1	277	272	-5
Disability Status:						
Disabled	186	183	-3	231	233	2
Not Disabled	226	219	-7	270	266	-4
English Language:						
Learner	189	171	-18			
Proficient	225	221	-4			
Parents' Education:						
No Diploma				250	252	2
High School				254	252	-2
Some College				266	270	4
College Degree				275	272	-3

	Fourth Grade		Eighth Grade			
	Nation	Arizona	Nation	Arizona	Nation	Arizona
Math, 2017						
All Test Takers	239	234	-5	282	282	0
Sex:						
Male	240	236	-4	282	285	3
Female	238	233	-5	282	280	-2
Race/Ethnicity:**						
White	248	247	-1	292	296	4
Black	223	216	-7	260	272	12
Hispanic	229	226	-3	268	269	1
Asian/Pacific Islander	258	253	-5	310	316	6
Native American	228	223	-5	268	263	-5
FRPL:***						
Eligible	228	224	-4	267	270	3
Not Eligible	253	251	-2	297	293	-4
Disability Status:						
Disabled	214	208	-6	246	241	-5
Not Disabled	243	237	-6	287	287	0
Parents' Education:						
No Diploma				265	265	0
High School				266	269	3
Some College				281	285	4
College Degree				294	296	2

(continued)

TABLE 12 (continued)
RECENT NAEP RESULTS, AVERAGE TEST SCORE BY POPULATION GROUP, PUBLIC ELEMENTARY AND SECONDARY EDUCATION

	Fourth Grade			Eighth Grade		
	Nation	Arizona	Differ*	Nation	Arizona	Differ*
Science, 2015						
All Test Takers	153	149	-4	153	148	-5
Sex:						
Male	153	149	-4	154	149	-5
Female	153	148	-5	151	146	-5
Race/Ethnicity:**						
White	165	166	1	165	162	-3
Black	132	139	7	131	131	0
Hispanic	138	137	-1	139	138	-1
Asian/Pacific Islander	166			163	166	3
Native American	141	128	-13	140	130	-10
FRPL:***						
Eligible	140	137	-3	140	137	-3
Not Eligible	169	167	-2	167	161	-6
Disability Status:						
Disabled	131	124	-7	124	119	-5
Not Disabled	156	152	-4	157	151	-6
Parents' Education:						
No Diploma				137	131	-6
High School				141	138	-3
Some College				154	152	-2
College Degree				160	160	0

Note: Test scores for most population groups have very large sampling error. Possible scores range from zero to 500 for mathematics and reading, and from zero to 300 for science.

* Differ: Difference, Arizona minus the nation.
** Hispanics are excluded from each of the racial categories.
*** FRPL: Free and reduced price lunch.
^ Highly inconsistent with historical record, likely reflects sampling error.

Source: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress.

Historical Record. A quick historical summary of Arizona's NAEP test results relative to the national average by subject, grade, and year administered are provided in Table 13. The vast majority of results indicate that Arizona's students have scored below the national average, with the shortfall usually statistically significant. In general, test scores in Arizona relative to the U.S. average were lower between 2002 and 2009 than in earlier or later years. Generally, Arizona's assessments appear to have improved relative to the nation since 2009, but this improvement only offsets the relative decline experienced during the 2000s:

- Fourth-grade math: The relative scores in 2013 and 2015 were the highest of the time series and not significantly less than the U.S. average, but the relative score in 2017 was back down to the historical norm and significantly less than the U.S. average.
- Eighth-grade math: The highest relative scores of the time series occurred in 2015 and 2017; these scores were not significantly different from the U.S. average.

- Fourth-grade reading: The relative scores in 2015 and 2017 were comparable to those during the 1990s and significantly less than the U.S. average.
- Eighth-grade reading: In 2015 and 2017, the relative scores were comparable to the score in 1998 and not significantly different from the U.S. average.
- Fourth- and eighth-grade science: The relative scores in 2015 were similar to those in 2000 and significantly less than the U.S. average.

In most of the tests, Arizona's ranks among the states have been quite low. Since some of tests have not been administered in all states, the rank in the following discussion is expressed as a percentile (where the lowest rank would be in the 100th percentile).

In the science tests, Arizona has scored in the 84th percentile or lower except in the 2000 test administered to eighth graders. The states that scored lower than Arizona in the majority of the nine science tests administered to fourth and eighth graders are Alabama, California, Hawaii, Louisiana, Mississippi, and New Mexico.

The states that scored lower than Arizona in the majority of the four writing tests administered to fourth and eighth graders are Hawaii, Mississippi, Nevada, and New Mexico, as well as the District of Columbia. Arizona ranked in the 80th percentile or lower except in the 1998 test administered to eighth graders.

TABLE 13
ACHIEVEMENT TEST SCORES, PUBLIC ELEMENTARY AND SECONDARY EDUCATION, ARIZONA LESS THE NATIONAL AVERAGE

Test:	Mathematics		Reading		Writing		Science	
Grade:	Fourth	Eighth	Fourth	Eighth	Fourth	Eighth	Fourth	Eighth
1990		-2*						
1992	-4	-2*	-6					
1994			-6					
1996	-4	-3*						
1998			-7	-1*		-5		
2000	-5	-3					-5	-3
2002			-12	-6	-13	-11		
2003	-5	-5	-7	-6				
2005	-7	-4	-10	-5			-10	-7
2007	-7	-4	-10	-6		-6		
2009	-9	-5	-10	-4			-11	-8
2011	-5	-4	-8	-4				-7
2013	-1*	-4	-8	-6				
2015	-2	2*	-6	-1*			-4	-5
2017	-5	0*	-6	-2				

* Not statistically different from the national average; if not indicated by an asterisk, Arizona's score is significantly less than the national average.

Source: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress.

In each of the reading tests taken by fourth graders, Arizona has scored at the 80th percentile or lower. The following states scored lower in a majority of the eight reading tests administered to fourth graders since 2003: California, Louisiana, Mississippi, and New Mexico, as well as the District of Columbia. Arizona's percentile on the reading tests taken by eighth graders has ranged from 62nd (in 1998) to 86th (in 2013). The following states scored lower in at least seven of the eight reading tests administered to eighth graders since 2003: Alabama, California, Hawaii, Louisiana, Mississippi, Nevada, and New Mexico, as well as the District of Columbia.

Arizona's percentile on the mathematics tests taken by fourth graders has ranged from 65th (in 2013) to 92nd (in 2005 and 2009). The following states scored lower in the majority of the eight math tests administered to fourth graders since 2003: Alabama, California, Louisiana, Mississippi, Nevada, and New Mexico, as well as the District of Columbia.

On the eighth grade math test, Arizona's percentile between 1990 and 2013 ranged from 57th to 76th, but Arizona ranked at the middle of the states in 2015 and 2017. The following states scored lower in at least seven of the eight math tests administered to eighth graders since 2003: Alabama, Arkansas, California, Georgia, Hawaii, Louisiana, Mississippi, Nevada, New Mexico, Tennessee, and West Virginia, as well as the District of Columbia.

Across the reading, writing, science, and mathematics tests taken by fourth and eighth graders, the District of Columbia and seven states — Alabama, California, Hawaii, Louisiana, Mississippi, Nevada, and New Mexico — generally scored below Arizona. This list includes three of the five states that border Arizona and three contiguous southern states.

An examination over time of the test scores for various population groups did not disclose reasons why Arizona's scores relative to the nation declined during the 2000s then returned to figures comparable to the 1990s. In years in which Arizona's overall score was relatively high or low versus the U.S. average, most population groups also had relatively high or low scores. No trend can be discerned in the scores of any group relative to other groups. The higher or lower scores in certain years could be real, or could reflect changes in the selection of participating schools. Even for schools with similar demographics, student achievement varies.

College Entrance Exams

College entrance exams are standardized aptitude tests used to evaluate students for college admissions purposes. There are two primary tests used in the United States: the American College Test (ACT) and the Scholastic Aptitude Test (SAT).

While tempting to use the ACT and the SAT test results to compare states and examine changes in test scores over time, significant variations in the percentage of high school students taking these tests — by state and over time — make such comparisons inappropriate. Some states mandate that all high school students take one of the tests (usually the ACT). Another cause of variation in the percentage taking a test is whether public universities in a given state require test scores from one of the tests as part of the admissions process. If so, the proportion of students taking that test is relatively high in that state. In any state, the average test score will decline as the percentage of students taking the test rises.

The range in the percentage of students taking each test is considerable across the states. In the most recent year, less than 15 percent of high school graduates took the SAT in 23 states, while more than 90 percent took the test in seven states. The ACT was mandated in 18 states, but in 14 states, fewer than 35 percent of the students took the test.

The average test score for a state varies substantially depending on the proportion of students taking the test. The average cannot be compared between a state that mandates that all students take the test and a state in which a small minority of students, nearly all of whom are college bound, take the test. Differences in the proportion taking a test over time also can affect the interpretation of the change in test scores over time in a particular state.

In Arizona, 30 percent of high school graduates in 2017 took the SAT, versus 48 percent nationally. Arizona's share was 63 percent of the national figure; since the 1990s, Arizona's percentage taking the SAT has ranged from 53-to-79 percent of the national average. Based simply on the below-average proportion taking the SAT, one would expect Arizona test takers to score above the national average. This has indeed been the case, though the differentials have been small. The average score in Arizona since the 1990s has ranged from 1-to-5 percent above the nation on the writing and mathematics sections of the test, and from 3-to-7 percent above average on the reading portion. Arizona has only ranked among the middle of the states on each section, despite the below-average share taking the test.

Arizona scored further above the national average on the SAT prior to the 1990s, but data on the percentage of high school graduates taking the test are not available from this time period. Thus, one cannot conclude that the performance of Arizonans relative to the nation has been lower since the 1990s.

The percentage of graduates in 2017 who took the ACT was similar in Arizona (62 percent) to the national average (60 percent). Thus, the results should be reasonably comparable. The composite score was 21.0 nationally and 19.7 in Arizona, which ranked tied for 41st. Arizona compared most favorably on the mathematics portion of the test, ranking tied for 35th, and least favorably on the English portion, ranking tied for 44th.

All of the states that scored lower than Arizona on the ACT composite had at least 90 percent of their high school graduates take the test. Other than Hawaii and Nevada, each of the states with a lower score are located in the South. The score in Arizona was the same as New Mexico, which had 66 percent of its graduates take the test. In only four other states was the proportion of test takers within 10 percentage points of Arizona's 62 percent; among these states, the proportion taking the test was lower only in Georgia. The score in Alaska was barely higher than in Arizona, but Georgia, Iowa, and West Virginia scored higher than Arizona.

While it is difficult to compare the results of Arizonans on the college entrance exams due to differences in the share taking the test, it appears that the performance of Arizona students is below average.

Completions

Historically, completion data, expressed as dropout rates and graduation rates, were highly unreliable. Improvements in the system of tracking students has gradually improved quality, but issues remain.

The NCES annually reported the average freshman graduation rate (AFGR) by state from fiscal year 1991 through FY 2013. The AFGR is the percentage of those entering ninth grade who received a regular diploma within four years. It is based on the aggregate number of students in ninth grade and the aggregate number of diplomas four years later. Starting in FY 2011, the NCES produced an enhanced measure, the adjusted cohort graduation rate (ACGR), which adjusts the number of students entering ninth grade by those transferring in and out of a school. For the three years of overlap in the AFGR and ACGR, the ACGR was slightly lower nationally and in Arizona.

Nationally, the public school AFGR in fiscal year 1991 was 73.7 percent, according to the NCES. The figure slipped to 71.0 percent in FY 1996. After that, the AFGR rose, reaching 81.9 percent in FY 2013. The ACGR, which was 81.4 percent in FY 2013, reached 84.1 percent in FY 2016. The annual AFGR figures for Arizona were erratic, ranging from higher to lower than the U.S. average. Fiscal year 2005 was the last time Arizona was above average. Using the ACGR, Arizona has been below average in each year, by as much as 8 percent in FY 2014. In FY 2016, Arizona's figure of 79.5 was 5.5 percentage points less than the national average and ranked 43rd.

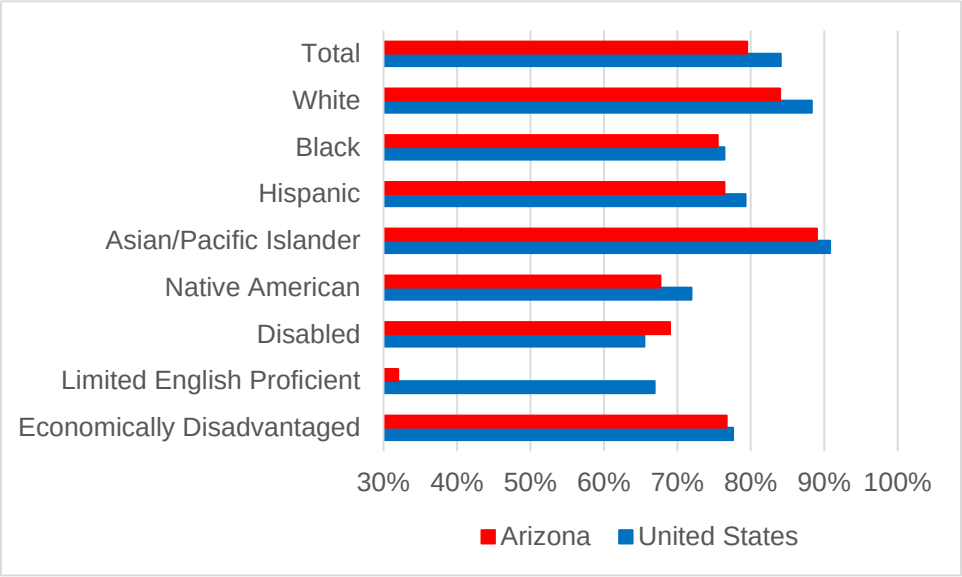
Since fiscal year 2013, the ACGR has been reported by state for several population groups, including five racial/ethnic groups. Nationally, the ACGR has been highest among non-Hispanic Asians and Pacific Islanders; it was 90.8 percent in FY 2016. Non-Hispanic whites also have had an above-average ACGR; it was 88.3 percent in FY 2016. Each of the other racial/ethnic groups have had a below-average ACGR. The FY 2016 figures were 79.3 percent among Hispanics, 76.4 percent among non-Hispanic blacks, and 71.9 percent among non-Hispanic Native Americans. Between FYs 2013 and 2016, the ACGR rose in each group, with non-Hispanic blacks and Hispanics posting the greatest gains, narrowing the gap from non-Hispanic whites and non-Hispanic Asians and Pacific Islanders.

The ACGR also is reported for the following groups:

- Disabled. The FY 2016 ACGR was 65.5 percent nationally, up 3.6 percentage points from FY 2013.
- Limited English proficient. The U.S. fiscal year 2016 ACGR was 66.9 percent, up 5.8 percentage points from FY 2013.
- Economically disadvantaged. The national FY 2016 ACGR was 77.6 percent, up 4.3 percentage points from FY 2013.

In Arizona, the ACGRs have been below the national average in each group except for the disabled, which has fluctuated from higher to lower than the U.S. average. The differential from the nation has been small among non-Hispanic blacks but very large among students with limited English proficiency (see Chart 16). Each group in Arizona except non-Hispanic whites experienced a greater gain between FYs 2013 and 2016 than its national counterpart.

CHART 16
ADJUSTED COHORT GRADUATION RATES, PUBLIC HIGH SCHOOLS, FISCAL YEAR 2016



Source: U.S. Department of Education, National Center for Education Statistics.

College Attendance

For even-numbered school years from 2004 through 2012, the NCES estimated the percentage of high school graduates from the prior year who were attending a degree-granting institution of higher education. Private schools were included — both graduates from private secondary schools and students enrolled at private institutions of higher education. The overall attendance rate was separated into higher education institutions within the same state versus institutions in other states.

In each year, the overall attendance rate was considerably lower in Arizona than in the nation, with the differential particularly large among those attending out-of-state institutions. Arizona was among the lowest-ranked states for the percentage of high school graduates attending an out-of-state institution and was among the bottom 10 states in the overall share attending a degree-granting institution. Nationally in fiscal year 2012, the overall proportion of high school graduates attending a degree-granting institution was 61.7 percent, with 50.0 percent attending an in-state institution and 11.7 percent going out of state. Arizona's overall proportion attending college was 53.1 percent, with 47.0 percent going to an in-state school and 6.1 percent attending an out-of-state institution.

Education Week Report

The publication *Education Week* annually produces a report "Quality Counts: Grading the States." The latest report, released in January 2018, evaluated states in three categories:

- Chance for Success. Indicators are grouped into three subcategories: early foundations (including family income, parental educational attainment, and parental employment), school years, and adult outcomes.

- School Finance. Spending indicators are equally weighted with indicators of spending equity across the state.
- K-12 Achievement. A number of indicators consider the status of achievement, the change over time, and equity measures of achievement.

An overall grade is assigned for each state.

Overall, Arizona ranked tied for 44th. Among 10 western states, it ranked seventh, ahead of Idaho, New Mexico, and Nevada. Other low-ranking states included Alabama, Louisiana, Mississippi, and Oklahoma. Most of the highest-ranking states are located in the northeastern portion of the country; Wyoming and Minnesota also were among the top 10.

In the chance for success category, Arizona ranked 42nd nationally and eighth among the western states, ahead of Nevada and New Mexico. Other low-ranking states included Alabama, Alaska, Arkansas, Louisiana, Mississippi, Oklahoma, and West Virginia.

Arizona compared especially poorly in the school finance category, with a rank of 46th (of 49 states — the District of Columbia and Hawaii each have only one school district and thus could not be evaluated on the equity portion of the category). Arizona's score was 16 percent below the national average. Three western states ranked lower: Idaho, Nevada, and Utah.

Education Week did not update results in the K-12 achievement category; the results are from the 2016 report. At that time, Arizona was ranked in the middle of the states with a score nearly identical to the national average. Four of the western states scored higher: Colorado, Texas, Utah, and Washington.

HIGHER EDUCATION

The NCES collects a variety of data on higher education. Generally, data for private institutions are separated from data for public institutions. The data on private institutions in Arizona are highly misleading since operations of the University of Phoenix that occur elsewhere are reported in Arizona's data. In this section, only public institutions of higher education are discussed.

Enrollment

Enrollment at institutions of higher education is reported in two ways: a headcount of the number of students enrolled in the fall (commonly in October) and full-time-equivalent enrollment, also in the fall. In order to compare enrollment figures across states and over time, higher education enrollment (both the headcount and the FTE measure) is expressed per 1,000 residents (using the July 1 population estimate of the U.S. Census Bureau).

Public higher education enrollment per 1,000 residents in fall 2016 in Arizona was 16 percent higher than the national average, ninth highest in the nation. Enrollment per 1,000 at community colleges was 51 percent above average, sixth highest in the nation, while enrollment per 1,000 at public universities was 7 percent below average and ranked 34th. Compared to the enrollment headcount, full-time-equivalent enrollment per 1,000 at community colleges was not quite as far above average, while FTE enrollment per 1,000 at universities was closer to the U.S. average (see Table 14).

Students at two-year institutions accounted for 52 percent of Arizona's enrollment at public institutions of higher education in fiscal year 2016, compared to a national average of 40 percent. Arizona's share was sixth highest in the nation. On a full-time-equivalent basis, the differential between Arizona and the nation was not as large. FTE students at two-year institutions accounted for 40 percent of Arizona's higher education FTE enrollment at public institutions of higher education in FY 2016, compared to a national average of 32 percent. Arizona's share was eighth highest in the nation. Thus, Arizona has disproportionately high enrollment at community colleges, with an above-average proportion of those students attending part time.

In Table 15, the change in enrollment per 1,000 residents is examined over two time periods: from fall 1992 through fall 2007 (fiscal year 1993 through fiscal year 2008) and from fall 2007 through fall 2016. In the earlier period, enrollment per 1,000 residents (both the headcount and FTE) fell in Arizona relative to the nation, at both four-year and two-year institutions. In the more-recent period, FTE enrollment per 1,000 residents rose in Arizona relative to the nation at four-year institutions and declined less in Arizona than the national average at two-year institutions. FTE enrollment at two-year institutions as a share of the total dropped a little more in Arizona than the national average between fall 1992 and fall 2007; the declines in share in Arizona and the nation were nearly identical between fall 2007 and fall 2016.

The time series of full-time-equivalent enrollment per 1,000 residents is displayed in Chart 17 for Arizona and the nation. At two-year institutions, FTE enrollment per 1,000 residents in Arizona dropped more than the U.S. average. At four-year institutions, FTE enrollment per 1,000 residents in Arizona was above the U.S. average prior to fall 1998, then dropped below average, but has returned to near average.

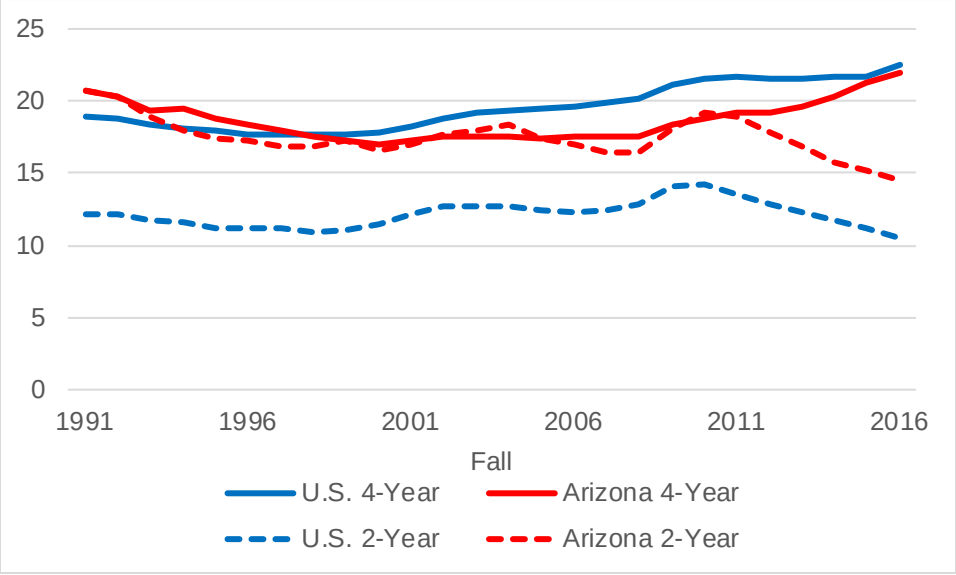
TABLE 14
ENROLLMENT PER 1,000 RESIDENTS,
PUBLIC INSTITUTIONS OF HIGHER EDUCATION, FALL 2016

	Nation	Arizona	Arizona Percent of Nation	Arizona Rank, 51 "States"	Arizona Rank, 10 Western States
Enrollment Per 1,000 Residents					
All Institutions	45.1	52.3	116.0%	9	4
Two-Year	18.1	27.2	150.6	6	3
Four-Year	27.0	25.1	92.9	34	9
Full-Time-Equivalent Enrollment Per 1,000 Residents					
All Institutions	32.9	36.4	110.7	16	4
Two-Year	10.4	14.5	138.6	7	3
Four-Year	22.5	22.0	97.7	31	7
Enrollment at Two-Year Institutions as a Share of the Total					
Total Enrollment	40.1	52.0	129.8	6	3
FTE Enrollment	31.7	39.7	125.2	8	3

Note: The District of Columbia did not have any two-year institutions throughout this time period; two-year enrollment in Delaware was zero in fall 2016.

Sources: U.S. Department of Education, National Center for Education Statistics (enrollment) and U.S. Department of Commerce, Census Bureau (population).

CHART 17
FULL-TIME-EQUIVALENT ENROLLMENT PER 1,000 RESIDENTS,
PUBLIC INSTITUTIONS OF HIGHER EDUCATION



Sources: U.S. Department of Education, National Center for Education Statistics (enrollment) and U.S. Department of Commerce, Census Bureau (population).

TABLE 15
CHANGE IN ENROLLMENT PER 1,000 RESIDENTS, PUBLIC INSTITUTIONS OF HIGHER EDUCATION

	Change			Percent Change				
	Percent of Nation	Rank, 51 "States"	Rank, 10 Western States	Nation	Arizona	Difference	Rank, 51 "States"	Rank, 10 Western States
Enrollment Per 1,000 Residents								
Fall 1992 through Fall 2007								
All Institutions	-27.1	-6	-3	0.9%	-17.6%	-18.5	49	9
Two-Year	-36.5	-3	-2	-1.8	-20.7	-18.9	46	8
Four-Year	-16.6	-12	-3	3.4	-12.5	-15.9	45	8
Fall 2007 through Fall 2016								
All Institutions	-4.2	-1	0	0.7	-2.9	-3.6	37	7
Two-Year	-2.4	-2	0	-14.0	-15.3	-1.3	37	5
Four-Year	1.5	6	-1	13.6	15.6	2.0	9	4
Full-Time Equivalent Enrollment Per 1,000 Residents								
Fall 1992 through Fall 2007								
All Institutions	-26.5	-20	-4	4.8	-16.3	-21.1	49	9
Two-Year	-35.5	-4	-2	2.4	-19.3	-21.7	44	7
Four-Year	-20.0	-16	-4	6.4	-13.3	-19.7	48	9
Fall 2007 through Fall 2016								
All Institutions	5.7	10	2	1.8	7.4	5.6	3	2
Two-Year	7.0	-1	0	-16.1	-11.6	4.5	29	5
Four-Year	9.3	12	2	13.0	25.0	12.0	6	3
Enrollment at Two-Year Institutions as a Share of the Total								
Fall 1992 through Fall 2007								
Total Enrollment	-1.5	1	1	-2.7	-3.8	-1.1	36	5
FTE Enrollment	-1.6	2	1	-2.3	-3.6	-1.3	35	5
Fall 2007 through Fall 2016								
Total Enrollment	2.6	-2	-1	-14.6	-12.8	1.8	38	6
FTE Enrollment	-0.2	-4	-1	-17.6	-17.7	-0.1	36	6

Note: The District of Columbia did not have any two-year institutions throughout this time period; two-year enrollment in Delaware was zero in fall 2016.

Sources: U.S. Department of Education, National Center for Education Statistics (enrollment) and U.S. Department of Commerce, Census Bureau (population).

Tuition

The NCES reports average tuition by state, differentiated by residence status and by type of institution (two-year versus four-year). In Table 16, average tuition in fiscal year 2017 and average tuition in FY 2016 adjusted for the cost of living are presented. The figures do not reflect any form of financial aid.

In fiscal year 2017, average tuition in Arizona for in-state students at the public universities was higher than the national average. Average tuition in Arizona for out-of-state students — at both two-year and four-year schools — was a little above average. In contrast, in-state tuition at Arizona's public community colleges was more than 30 percent below the U.S. average.

The change in average tuition is displayed in Table 17, with the time periods dependent on the earliest data released by the NCES. Between fiscal years 1995 and 2008, average in-state tuition rose much more in Arizona than nationally, at both two-year and four-year institutions. Between FYs 2008 and 2017, average in-state tuition at four-year institutions rose much more than the national average and was the third-largest increase in the nation, but the increase at community colleges was below average in Arizona.

Between fiscal years 2010 and 2017, average in-state tuition at Arizona's four-year institutions increased more than the national average, but in the other categories, the increase in average tuition was less in Arizona than the national average.

TABLE 16
AVERAGE TUITION, PUBLIC INSTITUTIONS OF HIGHER EDUCATION

			Arizona		
	Nation	Arizona	Percent of Nation	Rank, 51 "States"	Rank, 10 Western States
Fiscal Year 2017					
Two Year, In State	$3,156	$2,129	67.5	46	7
Four Year, In State	8,804	10,057	114.2%	13	1
Two Year, Out of State	7,668	7,931	103.4	28	5
Four Year, Out of State	24,854	25,061	100.8	20	5
Fiscal Year 2016 Adjusted for the Cost of Living					
Two Year, In State	3,038	2,148	70.7	47	7
Four Year, In State	8,778	10,301	117.3	16	1
Two Year, Out of State	7,409	8,604	116.1	24	4
Four Year, Out of State	24,354	25,181	103.4	25	5

Note: The tuition figures do not reflect financial aid.

Note: The District of Columbia did not have any two-year institutions in either year; Delaware did not have any two-year institutions in fiscal year 2017.

Sources: U.S. Department of Education, National Center for Education Statistics (tuition) and U.S. Department of Commerce, Bureau of Economic Analysis (regional price parities).

TABLE 17
CHANGE IN AVERAGE TUITION, PUBLIC INSTITUTIONS OF HIGHER EDUCATION

	Change			Real Percent Change				
	Percent of Nation	Rank, 51 "States"	Rank, 10 Western States	Nation	Arizona	Difference	Rank, 51 "States"	Rank, 10 Western States
Fiscal Years 1995 through 2008								
Two Year, In State	10.0	-1	0	31.7	53.0	21.3	22	6
Four Year, In State	12.7	8	1	68.9%	99.2%	30.3	15	3
Fiscal Years 2008 through 2017								
Two Year, In State	-4.1	0	0	33.7	26.0	-7.7	31	8
Four Year, In State	30.9	21	4	29.3	77.3	48.0	3	1
Fiscal Years 2010 through 2017								
Two Year, In State	-4.8	0	0	23.3	15.0	-8.3	32	8
Four Year, In State	13.8	9	1	17.3	33.5	16.2	9	3
Two Year, Out of State	-14.0	-6	-1	12.6	-0.7	-13.3	40	9
Four Year, Out of State	-8.2	0	0	20.2	11.2	-9.0	38	7

Note: The District of Columbia did not have any two-year institutions throughout this time period; Delaware did not have any two-year institutions in fiscal year 2017.

Sources: U.S. Department of Education, National Center for Education Statistics (tuition) and U.S. Department of Commerce, Bureau of Economic Analysis (gross domestic product implicit price deflator).

Average tuition in Arizona as a percentage of the national average is displayed in Chart 18 by category. Average tuition at Arizona's four-year institutions quickly went from well below the national average to considerably above average, with substantial relative increases in fiscal years 2004 and 2005 and again from FYs 2009 through 2013.

Finances

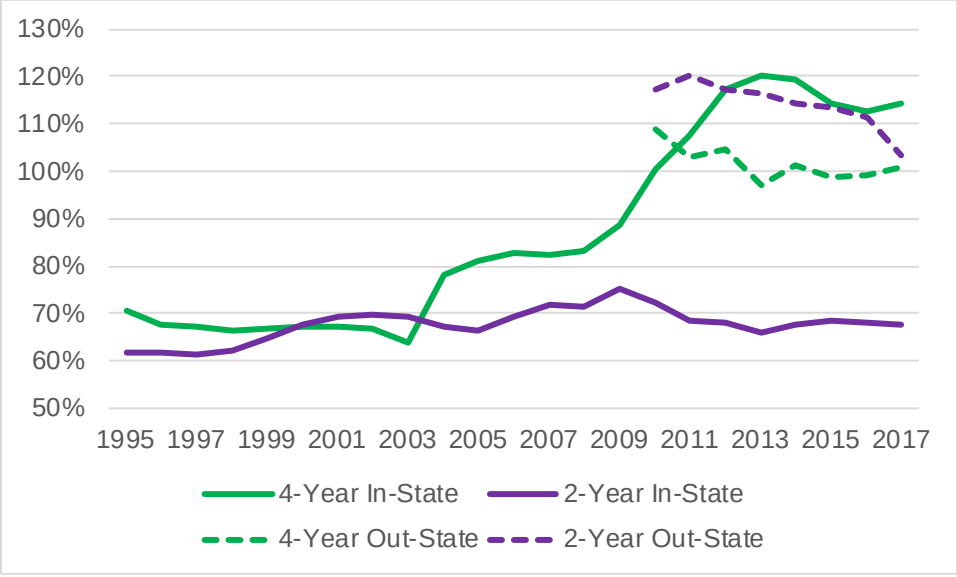
The time series of total revenues and expenditures of higher education was discussed in the September 2018 report "The Relationship Between Government Finance, Educational Attainment, and Economic Performance." Several time series charts of total revenue and state and local government appropriations were included in that paper. Categorical detail is emphasized in this paper.

The NCES provides public higher education revenue and expenditure data by state, but due to changes in the definitions of categories of revenues and expenditures, the categorical time series are relatively short, back to fiscal year 1993 for a few categories but only back to FY 2004 for most categories. Data by state are available online (https://nces.ed.gov/); the latest data are for FY 2016. While revenues are split into a number of categories, little detail is provided for expenditures. The revenue and expenditure data are standardized by dividing the dollar figures by the number of full-time-equivalent students.

NCES Revenue

Per full-time-equivalent student and adjusted for the cost of living, total public higher education revenue in Arizona in fiscal year 2016 was 19 percent less than the national average, among the lowest of the states. The NCES divides higher education revenue into three broad categories.

CHART 18
AVERAGE TUITION, PUBLIC INSTITUTIONS OF HIGHER EDUCATION, ARIZONA AS A PERCENTAGE OF THE NATIONAL AVERAGE



Source: U.S. Department of Education, National Center for Education Statistics.

Total operating revenue, the largest of the categories, was 26 percent below the U.S. average in fiscal year 2016 in Arizona on an adjusted per FTE student basis. Arizona was considerably below the national average in each subcategory except tuition and fees (see Table 18).

The second broad category is nonoperating revenue. Arizona's adjusted per FTE student nonoperating revenue was slightly above average in fiscal year 2016, despite below-average state and local government appropriations. Arizona was far below average on the smaller third category of other revenue.

Table 19 summarizes the change over time in higher education revenue per FTE student. Between fiscal years 1993 and 2008, the increase in Arizona was slightly greater than the U.S. average. The increase in the tuition and fees category also was a little more than the U.S. average. In contrast, between FYs 2008 and 2016, the increase in total revenue per FTE student was a little lower in Arizona than the U.S. average. Arizona's increase in operating revenue exceeded the national average due to a much larger increase in the tuition and fees category. In contrast, nonoperating revenue per FTE student dropped more in Arizona than nationally due to a larger decrease in state and local government appropriations.

The time series of revenue per FTE student in Arizona as a percentage of the national average is shown in Chart 19 for various revenue categories and subcategories. Total revenue per FTE student had been falling in Arizona relative to the nation before larger-than-average increases in tuition and fees began in fiscal year 2005. Despite continued above-average increases in tuition

TABLE 18
REVENUE PER FULL-TIME-EQUIVALENT STUDENT FROM THE NCES ADJUSTED FOR THE COST OF LIVING, PUBLIC INSTITUTIONS OF HIGHER EDUCATION, FISCAL YEAR 2016

			Arizona		
	Nation	Arizona	Percent of Nation	Rank, 51 "States"	Rank, 10 Western States
Total Revenue	$34,478	$28,025	81.3%	43	8
Total Operating Revenue	20,909	15,493	74.1	43	8
Tuition and Fees	7,247	9,315	128.5	13	2
Grants & Contracts: Federal	2,619	2,170	82.8	38	8
Grants & Contracts: Other	1,965	1,366	69.5	41	7
Sales of Auxiliaries	2,610	1,819	69.7	44	6
Sales of Hospitals	4,348	0	0.0	26t	8t
Other	2,120	823	38.8	46	10
Total Nonoperating Revenue	11,800	12,154	103.0	21	6
State & Local Appropriations	7,514	6,644	88.4	36	8
Other	4,286	5,510	128.6	5	3
Other Revenue	1,769	378	21.4	48	10

t: tie

Sources: U.S. Department of Education, National Center for Education Statistics (revenue) and U.S. Department of Commerce, Bureau of Economic Analysis (regional price parities).

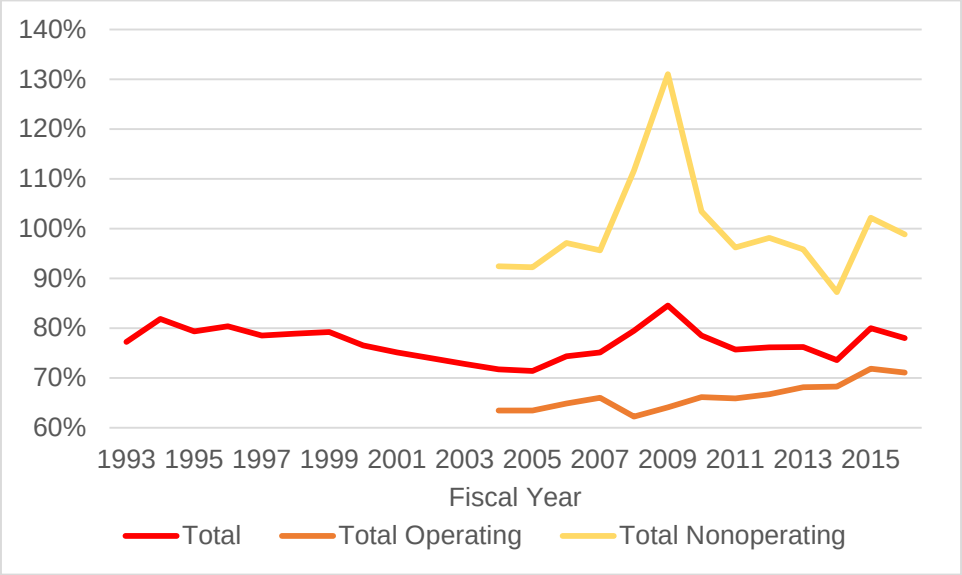
TABLE 19
CHANGE IN REVENUE PER FULL-TIME-EQUIVALENT STUDENT FROM THE NCES, PUBLIC INSTITUTIONS OF HIGHER EDUCATION

	Change			Real Percent Change				
	Percent of Nation	Rank, 51 "States"	Rank, 10 Western States	Nation	Arizona	Difference	Rank, 51 "States"	Rank, 10 Western States
Fiscal Years 1993 through 2008								
Total Revenue	2.3	1	0	49.0%	53.3%	4.3	20	6
Total Operating Revenue								
Tuition and Fees	5.2	-4	0	45.6	54.2	8.6	24	6
Grants & Contracts: Federal	-13.7	-14	-3	29.3	10.6	-18.7	45	8
Grants & Contracts: Other								
Sales of Auxiliaries	-14.3	-6	2	17.9	-0.3	-18.2	39	8
Sales of Hospitals	0.0	7	0	26.1	-	-	-	-
Other								
Total Nonoperating Revenue								
State & Local Appropriations								
Other								
Other Revenue								
Fiscal Years 2008 through 2016								
Total Revenue	-1.5	3	2	9.2	7.1	-2.1	29	6
Total Operating Revenue	8.9	5	2	19.7	36.7	17.0	1	1
Tuition and Fees	29.2	19	2	30.4	70.9	40.5	1	1
Grants & Contracts: Federal	-1.6	-1	1	-11.3	-13.0	-1.7	30	6
Grants & Contracts: Other	27.6	12	3	2.8	75.2	72.4	2	1
Sales of Auxiliaries	-11.4	-5	-1	10.1	-5.9	-16.0	44	8
Sales of Hospitals	0.0	0	0	49.3	-	-	-	-
Other	0.7	0	0	19.9	22.4	2.5	18	5
Total Nonoperating Revenue	-12.8	-6	-2	-3.1	-14.2	-11.1	42	9
State & Local Appropriations	-29.1	-22	-6	-16.4	-37.7	-21.3	48	10
Other	17.9	11	2	34.5	57.4	22.9	17	4
Other Revenue	-12.2	-3	0	-8.8	-42.7	-33.9	40	6

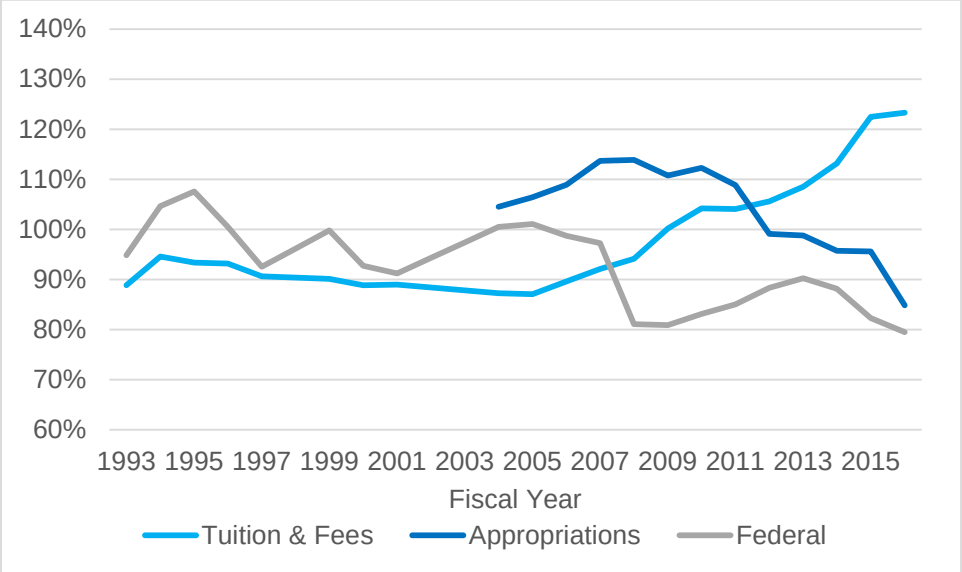
Sources: U.S. Department of Education, National Center for Education Statistics (revenue) and U.S. Department of Commerce, Bureau of Economic Analysis (gross domestic product implicit price deflator).

CHART 19
REVENUE PER FULL-TIME-EQUIVALENT STUDENT FROM THE NCES, PUBLIC INSTITUTIONS OF HIGHER EDUCATION, ARIZONA AS A PERCENTAGE OF THE NATIONAL AVERAGE

BROAD CATEGORIES

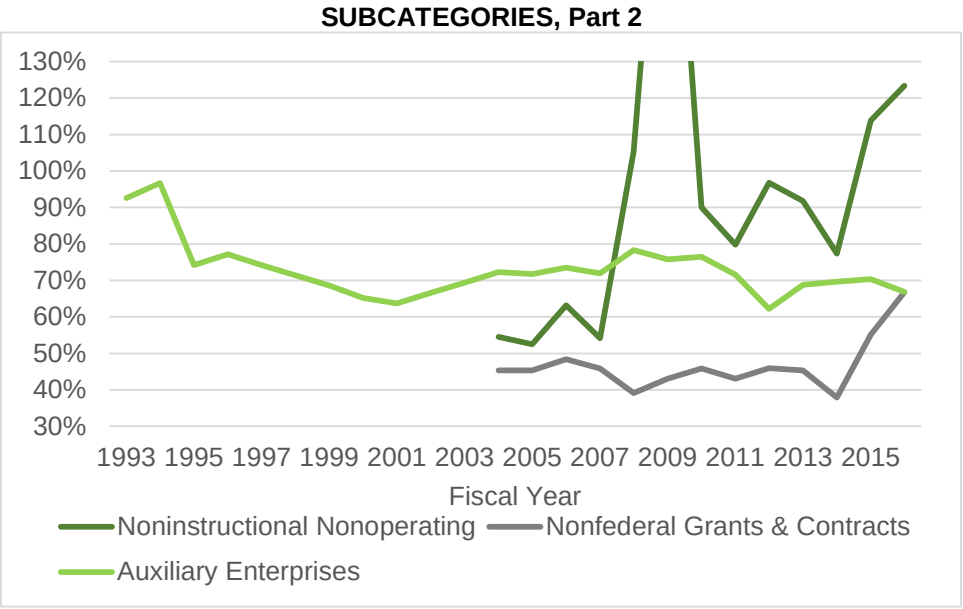


SUBCATEGORIES, Part 1



(continued)

CHART 19 (continued)
REVENUE PER FULL-TIME-EQUIVALENT STUDENT FROM THE NCES,
PUBLIC INSTITUTIONS OF HIGHER EDUCATION,
ARIZONA AS A PERCENTAGE OF THE NATIONAL AVERAGE



Note: The value in FY 2009 in the noninstructional nonoperating subcategory was 220 percent.

Source: U.S. Department of Education, National Center for Education Statistics.

and fees, total revenue per FTE student fell after FY 2009 due to substantial reductions in state and local government appropriations. As a result, overall revenue per FTE student in Arizona has fluctuated, generally between 20-and-29 percent below the U.S. average.

NCES Expenditures

The categorical expenditure detail from the NCES, which is limited to instruction-related expenditures and other spending, is available only for fiscal years 2006 through 2016. Unlike the revenue data, the expenditure data are split by two-year and four-year institutions.

The fiscal year 2016 expenditure data from the NCES are summarized in Table 20. Per full-time-equivalent student adjusted for the cost of living, total expenditures in FY 2016 were considerably below average at Arizona's public universities and a little below average at its community colleges. Total higher education expenditures per FTE student were 21 percent below the national average, 44th in the nation and eighth among the western states.

At four-year schools, noninstructional spending per full-time-equivalent student was further below average than instructional spending, but at two-year schools, instructional spending per FTE student was below average while other spending was a bit above average. As a share of total expenditures, instruction-related spending was above the national average at four-year institutions but below average at two-year institutions.

TABLE 20
EXPENDITURES PER FULL-TIME-EQUIVALENT STUDENT ADJUSTED FOR THE COST OF LIVING, PUBLIC INSTITUTIONS OF HIGHER EDUCATION, FISCAL YEAR 2016

	Nation	Arizona	Arizona Percent of Nation	Arizona Rank, 51 "States"	Arizona Rank, 10 Western States
Expenditures					
All Institutions					
Total Expenditures	$33,561	$26,566	79.2%	44	8
Instruction Expenditures	10,234	8,559	83.6	46	10
Other Expenditures	23,327	18,007	77.2	41	8
Two-Year Institutions					
Total Expenditures	14,872	14,450	97.2	30	4
Instruction Expenditures	6,212	5,632	90.7	37	6
Other Expenditures	8,659	8,818	101.8	28	4
Four-Year Institutions					
Total Expenditures	43,203	35,227	81.5	35	8
Instruction Expenditures	12,309	10,652	86.5	36	7
Other Expenditures	30,894	24,574	79.5	34	8
Instruction as a Share of Total Expenditures					
All Institutions	30.5%	32.2%	105.7	25	3
Two-Year Institutions	41.8	39.0	93.3	37	9
Four-Year Institutions	28.5	30.2	106.1	27	5

Sources: U.S. Department of Education, National Center for Education Statistics (expenditures) and U.S. Department of Commerce, Bureau of Economic Analysis (regional price parities).

The change in higher education expenditures per full-time-equivalent student over the fiscal year 2006-through-2016 period is summarized in Table 21.[4] Overall higher education expenditures per FTE student dropped a little in Arizona relative to the national average, with a larger relative decline in the instructional category than the noninstructional category. Per FTE student spending fell by more at the universities than at the community colleges. However, inflation-adjusted spending per FTE student still rose in Arizona in each category. Between FYs 2006 and 2016, the instructional share fell considerably at the universities but dropped only slightly at the community colleges.

In Chart 20, the time series of higher education expenditures per full-time-equivalent student in Arizona as a percentage of the national average is displayed. Over this period, total expenditures per FTE in Arizona did not change much relative to the national average, similar to total revenue as seen in Chart 19.

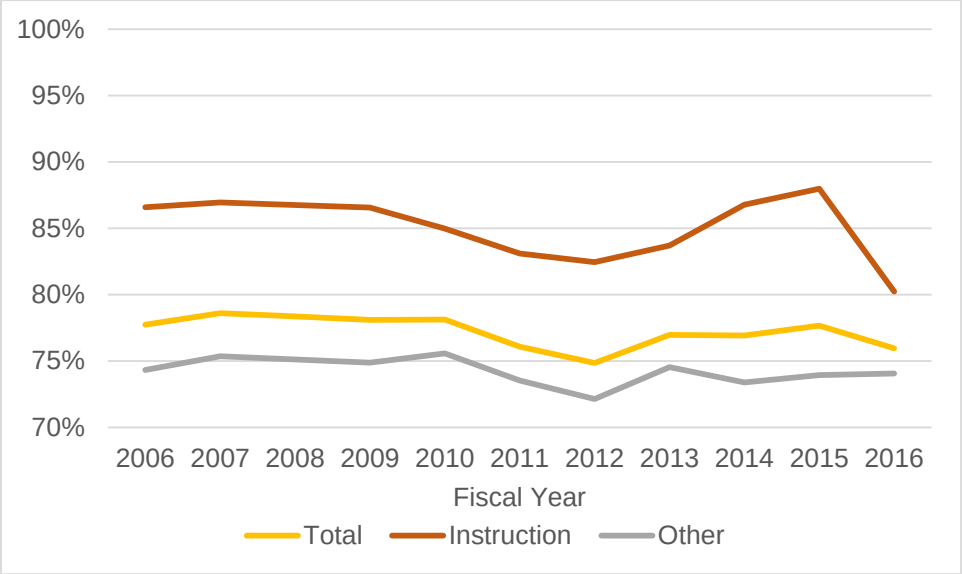
[4] This 10-year period represents the first and last years of data available from the NCES; data for FY 2008 are not available.

TABLE 21
CHANGE IN EXPENDITURES PER FULL-TIME-EQUIVALENT STUDENT, PUBLIC INSTITUTIONS OF HIGHER EDUCATION, FISCAL YEARS 2006 THROUGH 2016

	Change			Real Percent Change				
	Percent of Nation	Rank, 51 "States"	Rank, 10 Western States	Nation	Arizona	Difference	Rank, 51 "States"	Rank, 10 Western States
Change in Expenditures								
All Institutions								
Total Expenditures	-1.7	5	1	17.3%	14.7%	-2.6	27	7
Instruction Expenditures	-6.4	-2	-1	28.7	19.3	-9.4	37	9
Other Expenditures	-0.2	4	0	13.0	12.6	-0.4	25	7
Two-Year Institutions								
Total Expenditures	-1.1	3	3	13.5	12.2	-1.3	28	4
Instruction Expenditures	-1.3	8	4	22.2	20.4	-1.8	29	4
Other Expenditures	-0.4	2	1	8.0	7.6	-0.4	22	2
Four-Year Institutions								
Total Expenditures	-5.1	-2	-1	12.2	5.4	-6.8	39	8
Instruction Expenditures	0.0	-10	-2	25.8	10.3	-15.5	44	9
Other Expenditures	-3.1	-3	-1	7.6	3.4	-4.2	33	8
Change in Instructional Share of Total Expenditures								
All Institutions	-5.7	-9	0					
Two-Year Institutions	-0.4	-1	-2					
Four-Year Institutions	-7.6	-11	-2					

Sources: U.S. Department of Education, National Center for Education Statistics (expenditures) and U.S. Department of Commerce, Bureau of Economic Analysis (gross domestic product implicit price deflator).

CHART 20
EXPENDITURES PER FULL-TIME-EQUIVALENT STUDENT, PUBLIC INSTITUTIONS OF HIGHER EDUCATION, ARIZONA AS A PERCENTAGE OF THE NATIONAL AVERAGE



Source: U.S. Department of Education, National Center for Education Statistics.

SHEEO Revenue

The State Higher Education Executive Officers Association (SHEEO) in their "State Higher Education Finance" project (http://sheeo.org/projects/shef-%E2%80%94-state-higher-education-finance) report revenue data using a much more narrow definition than the NCES. Total revenue includes only two categories:

- State and local government appropriations for public higher education — excluding appropriations for special purposes, research, and medical programs.
- Tuition, excluding tuition monies used for capital or debt service.

Data for fiscal years 1980 through 2017 are available. A measure of full-time-equivalent enrollment that excludes medical students is included in the SHEEO's dataset.

Recent revenue data collected by the SHEEO are summarized in Table 22. In fiscal year 2017, state and local government educational appropriations per FTE student in Arizona were 33 percent below the national average, seventh lowest in the nation and third lowest among the western states. In contrast, net tuition per FTE student in Arizona was 26 percent above average, 20th highest nationally and third highest among the western states. The high tuition largely offset the low appropriations, such that total revenue per FTE student was not substantially below the U.S. average. State and local appropriations accounted for only 39 percent of total revenue in Arizona, considerably below the national average of 54 percent.

Fiscal year 2016 data also are shown in Table 22, adjusted for the cost of the living. The cost-of-living adjustment narrows Arizona's shortfalls from the national average in total revenue and appropriations per full-time-equivalent student. However, Arizona ranks even lower after the

TABLE 22
REVENUE PER FULL-TIME-EQUIVALENT STUDENT FROM THE SHEEO, PUBLIC INSTITUTIONS OF HIGHER EDUCATION

	Nation	Arizona	Arizona Percent of U.S. Average	Arizona Rank, 50 States	Arizona Rank, 10 Western States
Fiscal Year 2017					
Total Revenue	$14,151	$13,098	92.6%	32	3
Appropriations	7,642	5,148	67.4	44	8
Tuition	6,572	8,259	125.7	20	3
Fiscal Year 2016, Adjusted for the Cost of Living					
Total Revenue	$13,846	13,450	97.1	35	3
Appropriations	7,405	5,383	72.7	45	9
Tuition	6,507	8,438	129.7	21	3
Appropriations Share of Total Revenue					
Fiscal Year 2017	54.0	39.3	72.8	40	9

Note: Total revenue is narrowly defined to be the sum of appropriations from state and local governments — excluding those for special purposes, research and medical programs — and net tuition, which excludes tuition monies used for capital or debt service. Revenues of universities and community colleges are combined. Full-time-equivalent enrollment excludes medical students. The District of Columbia is not included.

Sources: State Higher Education Executive Officers Association (revenue) and U.S. Department of Commerce, Bureau of Economic Analysis (regional price parities).

adjustment is made, dropping from 43rd to 45th on appropriations per FTE student and from 32nd to 35th on total revenue per FTE student in FY 2016.

In Table 23, the change in revenue over three periods — fiscal years 1980 to 1993, FYs 1993 to 2008, and FYs 2008 to 2017 — is summarized. In each of the first two periods, the real percent change in total revenue per full-time-equivalent student increased more in Arizona than the national average; above-average increases were measured in tuition per FTE student and in state and local appropriations per FTE student. However, between FYs 2008 and 2017, educational appropriations per FTE student in Arizona dropped significantly more than the national average while net tuition per FTE student increased substantially more than average. Total revenue per FTE student in Arizona rose less than the national average between FYs 2008 and 2017.

Educational appropriations accounted for 79 percent of total revenue in fiscal year 1980, both nationally and in Arizona. As seen in Chart 21, the share dropped at a similar pace nationally and in Arizona through FY 2010. Since then, the share has dropped much more in Arizona than nationally. In Arizona, the 39-percent share in FY 2017 was less than half the share in FY 1980.

The time series of higher education revenue per full-time-equivalent student in Arizona relative to the national average is shown in Chart 22. Between fiscal year 1980 and FY 2006, the percentage of the national average did not change much in any of the categories, with Arizona generally a little below average. Educational appropriations per FTE student rose faster than the national average in FYs 2007 through 2009, as did tuition. Since then, tuition in Arizona has

TABLE 23
CHANGE IN REVENUE PER FULL-TIME-EQUIVALENT STUDENT FROM THE SHEEO, PUBLIC INSTITUTIONS OF HIGHER EDUCATION

	Change			Real Percent Change				
	Percent of Nation	Rank, 51 "States"	Rank, 10 Western States	Nation	Arizona	Difference	Rank, 51 "States"	Rank, 10 Western States
Change in Revenue, Fiscal Years 1980 to 1993								
Total Revenue	6.1	15	3	24.1%	32.7%	8.6	12	2
Appropriations	8.0	10	0	8.5	18.3	9.8	13	5
Tuition	1.3	7	3	83.0	85.8	2.8	17	2
Change in Revenue, Fiscal Years 1993 to 2008								
Total Revenue	1.5	-1	3	32.8	40.0	7.2	19	3
Appropriations	6.4	8	3	24.0	32.3	8.3	14	1
Tuition	6.6	0	0	54.0	71.2	17.2	20	5
Change in Revenue, Fiscal Years 2008 to 2017								
Total Revenue	-2.7	-2	-1	9.0	2.0	-7.0	34	5
Appropriations	-34.3	-25	-4	-8.9	-39.6	-30.7	49	10
Tuition	28.6	10	0	41.6	76.7	35.1	3	1
Change in Appropriations Share of Total Revenue								
Fiscal Years 1980 to 1993	2.0	-2	-1					
Fiscal Years 1993 to 2008	1.2	-3	2					
Fiscal Years 2008 to 2017	-30.0	-21	-2					

Note: Total revenue is narrowly defined to be the sum of appropriations from state and local governments — excluding those for special purposes, research and medical programs — and net tuition, which excludes tuition monies used for capital or debt service. Revenues of universities and community colleges are combined. Full-time-equivalent enrollment excludes medical students. The District of Columbia is not included.

Sources: State Higher Education Executive Officers Association (revenue) and U.S. Department of Commerce, Bureau of Economic Analysis (gross domestic product implicit price deflator).

CHART 21
APPROPRIATIONS AS A SHARE OF TOTAL REVENUE, PUBLIC INSTITUTIONS OF HIGHER EDUCATION

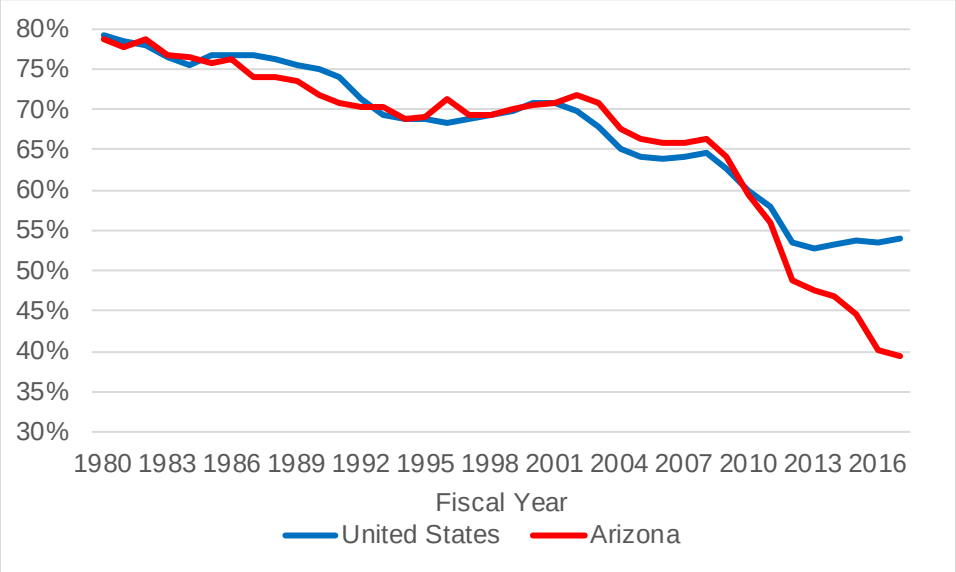
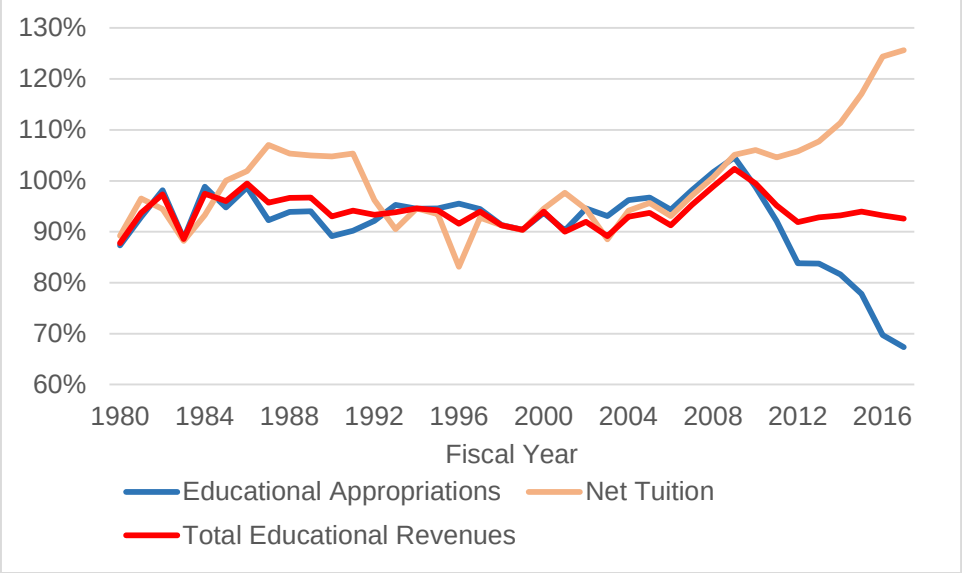


CHART 22
REVENUE PER FULL-TIME-EQUIVALENT STUDENT, PUBLIC INSTITUTIONS OF HIGHER EDUCATION, ARIZONA AS A PERCENTAGE OF THE NATIONAL AVERAGE



Note: Higher education includes community colleges and universities. Appropriations exclude funding for special purposes, research, and medical programs. Net tuition excludes tuition monies used for capital or debt service. The net tuition figure does not deduct student aid. Total revenue is the sum of the narrowly defined appropriations and net tuition.

Source (Charts 21 and 22): State Higher Education Executive Officers Association.

climbed further relative to the U.S. average but state and local appropriations per FTE student have plummeted in Arizona. Total revenue per FTE student has dropped back to the historical norm.

Chart 22 indicates that the tuition increases since fiscal year 2009 have largely offset the decline in appropriations. However, the tuition increases dramatically raised the financial burden on students and their families and, absent a pool of state-provided scholarship money, the universities channeled a significant share of new tuition money back to students in the form of scholarship aid. Thus, university revenue per FTE student available for purposes other than financial aid actually have decreased.

Faculty and Staff

In the left portion of Table 24, the number of full-time-equivalent students per employee — faculty and all staff — at public institutions of higher education in fall 2016 is presented. The figure in Arizona was greater than the national average except for staff at two-year institutions. The right side of Table 24 presents information on the inverse measure of the number of employees per FTE student. Arizona was considerably below the national average and ranked among the 10 lowest states in the nation, except relative to staff at community colleges.

Table 25 displays the change in the number of faculty and staff per full-time-equivalent student for two periods: from the earliest data for fall 1993 through fall 2007 (fiscal years 1994 through 2008) and from fall 2007 through fall 2016. Relative to the nation, the number of faculty/staff per FTE student fell at Arizona's public universities in each time period but the number rose at public community colleges, except for faculty between FYs 2008 and 2017.

TABLE 24
NUMBER OF FACULTY, STAFF, AND FULL-TIME-EQUIVALENT STUDENTS, PUBLIC INSTITUTIONS OF HIGHER EDUCATION, FALL 2016

	Number of FTE Students Per Employee		Number of Employees Per FTE Student, Arizona		
	Nation	Arizona	Percent of Nation	Rank, 51 "States"	Rank, 10 Western States
Faculty					
Two-Year Institution	18.7	20.8	90.0%	41	8
Four-Year Institution	14.4	18.3	78.8	49	9
Staff					
Two-Year Institution	8.7	8.4	103.4	29	5
Four-Year Institution	4.6	5.3	86.8	44	8

Note: Only 49 states have two-year institutions.

Source: U.S. Department of Education, National Center for Education Statistics.

TABLE 25
CHANGE IN NUMBER OF FACULTY AND STAFF PER FULL-TIME-EQUIVALENT STUDENT, PUBLIC INSTITUTIONS OF HIGHER EDUCATION

	Change			Percent Change				
	Percent of Nation	Rank, 51 "States"	Rank, 10 Western States	Nation	Arizona	Difference	Rank, 51 "States"	Rank, 10 Western States
Fiscal Years 1994 through 2008								
Faculty								
Two-Year Institution	22.0	7	0	0.9%	31.7%	30.8	5	2
Four-Year Institution	-3.4	-1	0	3.2	-1.0	-4.2	33	6
Staff								
Two-Year Institution	21.4	9	1	3.2	31.6	28.4	2	2
Four-Year Institution	-1.7	-6	0	0.3	-1.4	-1.7	36	8
Fiscal Years 2008 through 2017								
Faculty								
Two-Year Institution	-3.8	-2	1	3.5	-0.7	-4.2	34	4
Four-Year Institution	-2.0	0	1	2.1	-0.5	-2.6	37	6
Staff								
Two-Year Institution	4.0	8	3	4.8	8.9	4.1	21	2
Four-Year Institution	-9.7	-10	-3	-7.4	-16.7	-9.3	46	8

Note: Only 49 states have two-year institutions.

Source: U.S. Department of Education, National Center for Education Statistics.

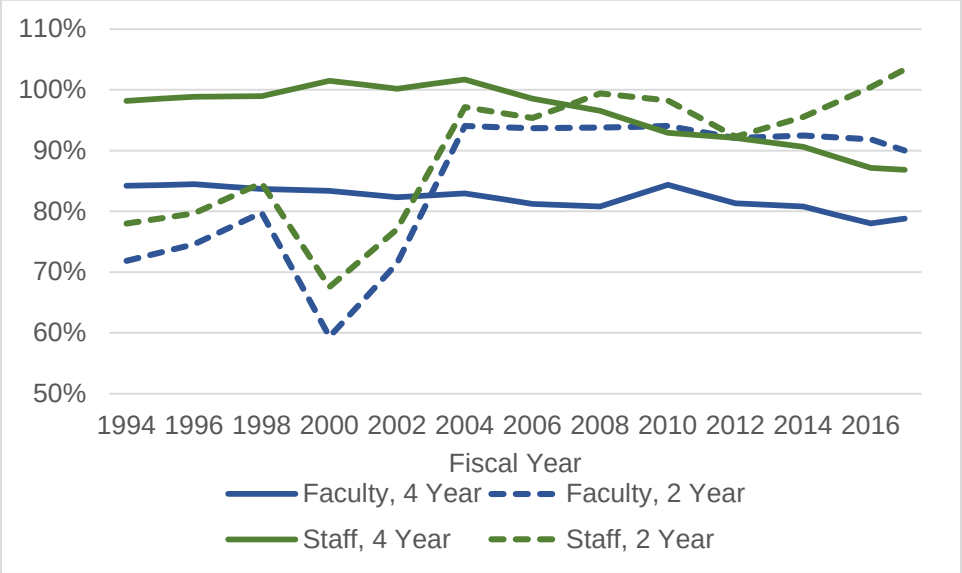
Chart 23 shows the time series of Arizona's percentage of the national average in each of the categories of faculty/staff per full-time-equivalent student. At four-year institutions, the number of faculty and staff per FTE student have gradually declined versus the national average. At two-year institutions, the number of faculty and staff per FTE student have increased versus the national average, though in an erratic annual pattern.

The NCES provides information on faculty salaries. The average faculty salary nationally and in Arizona varies considerably by the type of institution and by the rank of the faculty, as seen in Table 26. Since Arizona's public universities disproportionately are classified in the doctoral category, which has the highest average salary, the state's average for four-year institutions is raised relative to the nation.[5]

In fiscal year 2017, the average salary in Arizona was above average in each category except overall doctoral universities. After adjustment for the cost of living, the average salary in each of the categories was above the U.S. average in FY 2016.

Between fiscal years 1994 and 2008, the real percent change in the average salary at both two-year and four-year institutions was greater in Arizona than the U.S. average (see Table 27). In

CHART 23
NUMBER OF FACULTY AND STAFF PER FULL-TIME-EQUIVALENT STUDENT, PUBLIC INSTITUTIONS OF HIGHER EDUCATION, ARIZONA AS A PERCENTAGE OF THE NATIONAL AVERAGE



Sources: U.S. Department of Education, National Center for Education Statistics.

[5] In some years, the NCES reports salary data for four-year master's institutions and for four-year "other" institutions in Arizona, but the salary data appear to be unreliable. Arizona State University's Polytechnic and West campuses are classified in the master's category. Dine College, the Thunderbird School, and University of Arizona South are classified in the "other" category.

contrast, between FYs 2008 and 2017, the percent changes in Arizona were lower than the national average at both two-year and four-year institutions.

Average salaries in Arizona as a percentage of the national average are shown in Chart 24 for the available time series. At four-year institutions, the average generally rose relative to the nation through fiscal year 2008, but has dropped since then, especially since FY 2013. The percentage of the national average has been erratic at two-year institutions.

Degrees

The NCES reports the number of degrees granted, split into two-year institutions and four-year institutions. One means of standardizing these data is to divide the number of degrees by full-time-equivalent student enrollment (with four-year and two-year institutions separated) in the year the degrees were granted. As seen in the top portion of Table 28, the number of degrees granted relative to FTE enrollment at two-year institutions was below average in Arizona in fiscal year 2016. In contrast, the number of graduates at Arizona's public universities relative to the number of FTE students was above the U.S. average.

Another way to evaluate the number of degrees granted is to express the number per 1,000 residents. A number of factors affect the number of degrees awarded per 1,000 residents by state, including the age distribution of a state's residents and the popularity of the state's institutions with out-of-state students. The number of degrees per 1,000 residents by level of degree are

TABLE 26
AVERAGE FACULTY SALARY, PUBLIC INSTITUTIONS OF HIGHER EDUCATION

			Arizona		
	Nation	Arizona	Percent of Nation	Rank, 51 "States"	Rank, 10 Western States
Fiscal Year 2017					
Total	$81,211	$84,293	103.8%	10	2
Two Year	67,684	68,099	100.6	14	4
Four Year	85,612	87,429	102.1	15	2
Doctoral	91,794	88,868	96.8	27	6
Professor	128,503	128,636	100.1	18	3
Associate Professor	89,321	91,203	102.1	19	4
Assistant Professor	77,687	79,894	102.8	20	4
Fiscal Year 2016, Adjusted for the Cost of Living					
Total	78,856	86,733	110.0	8	1
Two Year	65,965	77,860	118.0	3	1
Four Year	83,398	90,166	108.1	10	1
Doctoral	89,539	91,512	102.2	21	4
Professor	117,049	122,800	104.9	15	2
Associate Professor	81,407	85,213	104.7	18	3
Assistant Professor	69,963	74,856	107.0	11	1

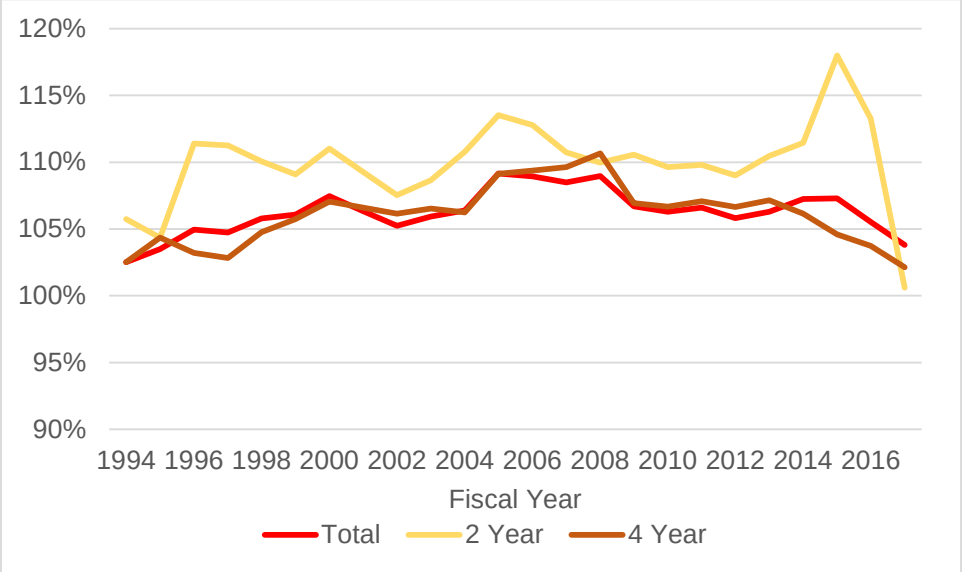
Sources: U.S. Department of Education, National Center for Education Statistics (salaries) and U.S. Department of Commerce, Bureau of Economic Analysis (regional price parities).

TABLE 27
CHANGE IN AVERAGE FACULTY SALARY, PUBLIC INSTITUTIONS OF HIGHER EDUCATION

	Change			Real Percent Change				
	Percent of Nation	Rank, 51 "States"	Rank, 10 Western States	Nation	Arizona	Difference	Rank, 51 "States"	Rank, 10 Western States
Fiscal Years 1994 through 2008								
Total	6.5	7	-1	12.1%	19.1%	7.0	10	2
Two Year	4.3	3	0	8.5	12.8	4.3	19	5
Four Year	8.2	8	0	13.2	22.2	9.0	5	1
Fiscal Years 2008 through 2017								
Total	-5.2	-3	1	2.8	-2.1	-4.9	45	8
Two Year	-9.4	-7	-2	-0.9	-9.4	-8.5	45	10
Four Year	-8.6	-10	0	2.6	-5.3	-7.9	51	10
Doctoral	-7.2	-12	-3	1.2	-5.8	-7.0	44	9
Professor	-1.4	-3	0	3.2	1.7	-1.5	31	8
Associate Professor	1.4	-2	0	2.8	4.3	1.5	20	5
Assistant Professor	-0.6	-6	-1	5.1	4.5	-0.6	28	6

Sources: U.S. Department of Education, National Center for Education Statistics (salaries) and U.S. Department of Commerce, Bureau of Economic Analysis (gross domestic product implicit price deflator).

CHART 24
AVERAGE FACULTY SALARY, PUBLIC INSTITUTIONS OF HIGHER EDUCATION, ARIZONA AS A PERCENTAGE OF THE NATIONAL AVERAGE



Sources: U.S. Department of Education, National Center for Education Statistics.

summarized in the bottom portion of Table 28. Overall, the total number of degrees granted per 1,000 residents in Arizona in fiscal year 2016 was a little above the U.S. average, with above-average figures for each type of degree.

Between the earliest data for fiscal year 1995 and FY 2008, the overall number of degrees granted as a percentage of the number of full-time-equivalent students rose more in Arizona than the national average (see Table 29). At community colleges, the number rose considerably in Arizona relative to the national average, though Arizona's rank barely rose. In contrast, the number at Arizona's public universities was essentially unchanged relative to the nation. While the number of degrees relative to FTE enrollment rose more in Arizona than nationally, the total number of degrees per 1,000 residents did not increase as much in Arizona as the national average. For bachelor's and master's degrees, the per capita number decreased in Arizona but increased nationally. For associate's degrees, a much larger increase occurred in Arizona than nationally.

Between fiscal year 2008 and FY 2016, the overall number of degrees granted relative to the number of full-time-equivalent students continued to rise more in Arizona than the national average, though the number slipped for two-year institutions. The total number of degrees granted per 1,000 residents increased more in Arizona than the national average, though only a slightly greater gain occurred in associate's degrees.

The time series of the number of degrees granted in Arizona as a percentage of the national average is displayed in Chart 25. As seen in the top graph, the number of degrees relative to full-time-equivalent enrollment advanced substantially at community colleges through FY 2009, but

otherwise the percentage of the national average has been little changed. The bottom graph displays the number of degrees per 1,000 residents, again with Arizona's figures expressed relative to the national average. Significant differences in trend were present by level of degree through the mid-2000s, but since then, the number of degrees per 1,000 residents has increased, except for doctoral/professional degrees.

For those receiving bachelor's degrees and master's degrees, the NCES reports the field of study, divided into 10 categories. For both types of degrees, the share of Arizona's graduates in fiscal year 2016 was greater than the national average in business, education, and health-related fields. The share of graduates in Arizona was below the national average in engineering, humanities, science/mathematics, and social sciences/history.

TABLE 28
NUMBER OF DEGREES GRANTED,
PUBLIC INSTITUTIONS OF HIGHER EDUCATION, FISCAL YEAR 2016

	Nation	Arizona	Arizona Percent of Nation	Arizona Rank, 51 "States"	Arizona Rank, 10 Western States
Percentage of Full-Time-Equivalent Enrollment by Type of Institution					
Total	24.1%	23.3%	96.7%	38	8
Two-Year Institution	23.6	18.5	78.5	47	9
Four-Year Institution	24.3	26.7	109.7	9	3
Per 1,000 Residents by Type of Degree					
Total	7.92	8.45	106.7	22	6
Associate's	2.64	2.80	106.0	16	7
Bachelor's	3.86	4.03	104.4	26	5
Master's	1.14	1.33	117.4	16	4
Doctoral/Professional	0.28	0.28	100.5	30	4

Sources: U.S. Department of Education, National Center for Education Statistics (degrees and enrollment) and U.S. Department of Commerce, Census Bureau (population).

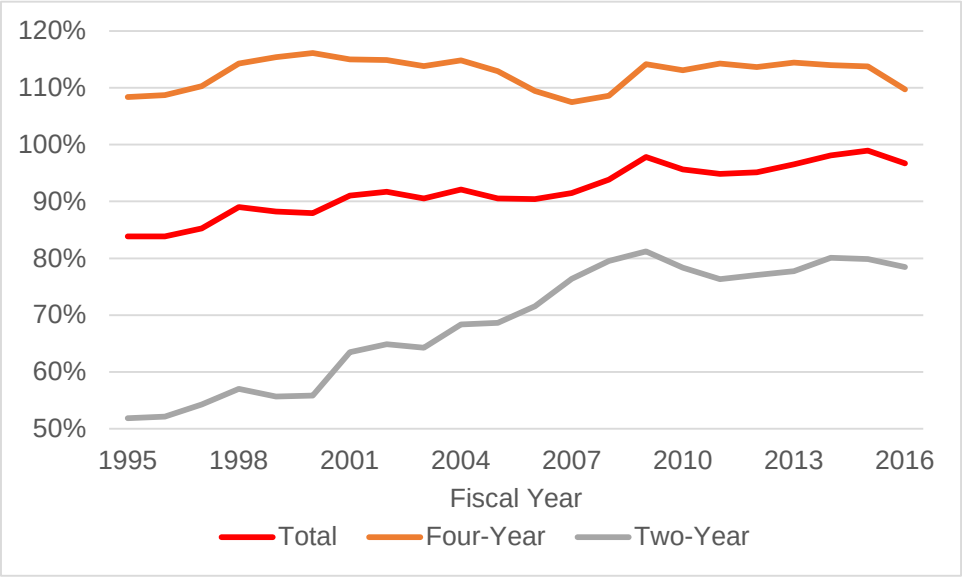
TABLE 29
CHANGE IN NUMBER OF DEGREES GRANTED, PUBLIC INSTITUTIONS OF HIGHER EDUCATION

	Change			Percent Change				
	Percent of Nation	Rank, 51 "States"	Rank, 10 Western States	Nation	Arizona	Difference	Rank, 51 "States"	Rank, 10 Western States
Fiscal Years 1995 through 2008								
As a Percentage of Enrollment by Type of Institution:								
Total	10.1	6	2	3.2%	15.5%	12.3	3	2
Two-Year Institution	27.6	2	1	3.8	59.1	55.3	3	2
Four-Year Institution	0.2	0	0	2.6	2.8	0.2	30	6
Per 1,000 Residents by Type of Degree:								
Total	-7.5	-9	-2	12.7	4.8	-7.9	41	8
Associate's	23.9	12	1	11.9	45.0	33.1	4	1
Bachelor's	-16.6	-13	-4	12.1	-4.8	-16.9	47	10
Master's	-32.5	-15	-3	16.9	-11.5	-28.4	48	10
Doctoral/Professional	-31.6	-19	-3	12.7	4.8	-7.9	41	8
Fiscal Years 2008 through 2016								
As a Percentage of Enrollment by Type of Institution:								
Total	2.8	2	-2	20.1	23.8	3.7	14	6
Two-Year Institution	-1.0	1	0	52.7	50.6	-2.1	23	9
Four-Year Institution	1.1	-1	0	6.2	7.3	1.1	36	6
Per 1,000 Residents by Type of Degree:								
Total	8.2	9	1	22.3	32.4	10.1	6	4
Associate's	1.3	0	-2	37.6	39.3	1.7	20	8
Bachelor's	10.3	12	4	16.8	29.6	12.8	4	1
Master's	15.8	8	2	14.0	31.8	17.8	7	3
Doctoral/Professional	2.2	0	1	22.3	32.4	10.1	6	4

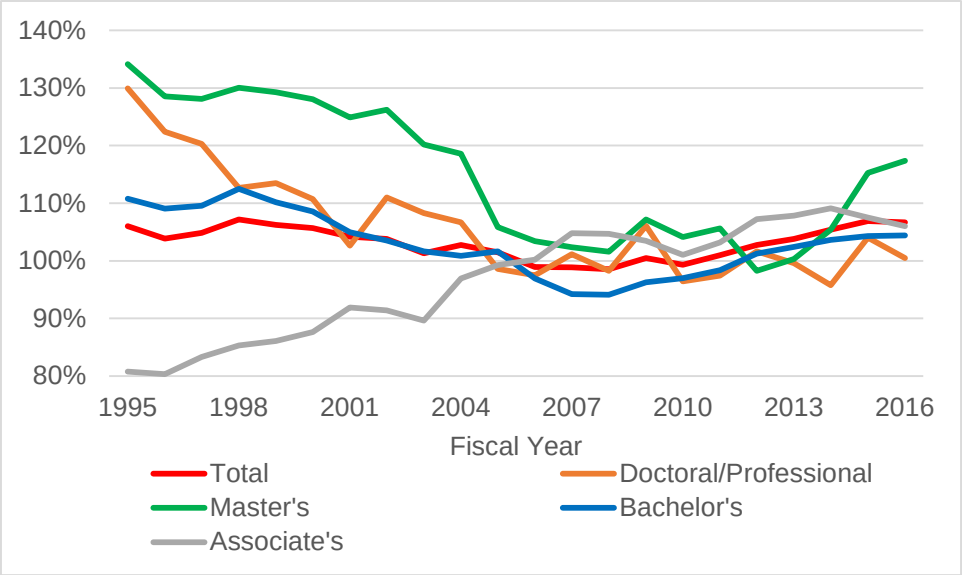
Sources: U.S. Department of Education, National Center for Education Statistics (degrees and enrollment) and U.S. Department of Commerce, Census Bureau (population).

CHART 25
NUMBER OF DEGREES GRANTED, PUBLIC INSTITUTIONS OF HIGHER EDUCATION, ARIZONA AS A PERCENTAGE OF THE NATIONAL AVERAGE

AS A PERCENTAGE OF ENROLLMENT BY TYPE OF INSTITUTION



PER 1,000 RESIDENTS BY TYPE OF DEGREE



Sources: U.S. Department of Education, National Center for Education Statistics.

EDUCATIONAL ATTAINMENT

Educational attainment was discussed in the September 2018 paper "The Relationship Between Government Finance, Educational Attainment, and Economic Performance." A brief summary follows.

The educational attainment of Arizona's adults is below the national average — considerably below average among those younger than 45. The attainment of Arizonans in the workforce also is below average.

Educational attainment is measured for all adults. It is not entirely dependent on a state's educational system, since so many people migrate — from other states and other countries — after completing their education. The educational attainment of migrants is in part dependent on the types of jobs available in the state.

The low overall attainment in Arizona is primarily due to the low attainment of those receiving their education in Arizona and to the low attainment of Arizona's immigrants. In addition, a below-average share of interstate migrants to Arizona have earned at least a bachelor's degree. Since educational attainment is strongly correlated with earnings, educational attainment plays a large role in the state's below-average income.

Arizona's poor performance on educational attainment is a relatively recent phenomenon. Through 1970, Arizona was among the national leaders on educational attainment and it was not until after 1990 that Arizona fell below average. Arizona continues to fall further behind the national average.

EVALUATION OF SPENDING NEEDS FOR EDUCATION

In this paper, per student funding for education in Arizona, adjusted by the cost of living, has been compared to the national average, and Arizona's funding has been ranked among all states and among 10 western states. The national average (or the median of the states) is a reasonable initial benchmark in assessing the adequacy of per student funding. Given (1) the wording in Arizona's Constitution that implies that spending on education should be higher than average, and (2) that spending per student was in excess of the national average for the first several decades of statehood, education funding equal to the national per student average is a conservative target. Moreover, the Constitution's "development and improvement" clause suggests that per student funding should increase more than the national average.

Fiscal Need

Moreover, "fiscal need" — defined as national average spending per capita adjusted for the workload and other factors in a specific state — should be considered. In the case of education, the workload is the number of students. For higher education, the proportion of the population of college age typically is another factor considered in determining fiscal need. For elementary and secondary education, the socioeconomics of the families of the students, generally as measured by the poverty rate, is another factor considered in determining fiscal need.

Numerous studies have indicated that, on average, disadvantaged children — from low-income households, whose parents have limited educational attainment, etc. — reach school age with a lesser grasp of fundamentals than other children. In order to reach the achievement levels of other children, students from disadvantaged households generally require additional resources to be expended, particularly at young ages. For example, in the early grades, research has determined that disadvantaged children should be placed in classrooms with at most 18 students. In such a setting, a disadvantaged child is more likely to receive the specialized attention needed to catch up to other children.

The most-recent study of fiscal need used fiscal year 2012 data.[6] The fiscal need for higher education in Arizona was assessed as being marginally less than the national average, based on the proportion of the population of traditional college age. However, the fiscal need for elementary and secondary education was 11 percent above the national average, reflecting Arizona's high poverty rate. Arizona's need for elementary and secondary spending per student was fifth highest in the nation, but actual per student spending ranked 50th.

Shortfall in Education Funding Relative to National Average

State and local government appropriations for elementary and secondary education in fiscal year 2016 needed to be $4.16 billion higher in Arizona to equal the national average per student, after adjusting for the state's lower cost of living, based on the Census Bureau's data.[7] Bringing this estimate forward to the current fiscal year (2019) requires estimates and projections of inflation and enrollment growth since FY 2016. An estimated $4.49 billion in additional state and local

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[6] Urban Institute, "Assessing Fiscal Capacities of States: A Representative Revenue System–Representative Expenditure System Approach, Fiscal Year 2012," March 2016, https://www.urban.org/research/publication/assessing-fiscal-capacities-states-representative-revenue-system-representative-expenditure-system-approach-fiscal-year-2012.

[7] Based on data from the NCES for FY 2015, a marginally larger shortfall is estimated.

government funding would be required to reach the per student national average in FY 2019, without considering fiscal need or the language in the Arizona Constitution.

State and local government appropriations for higher education in Arizona in fiscal year 2017 needed to be $626 million higher to equal the national average per full-time-equivalent student, after adjusting for Arizona's lower cost of living, based on the SHEEO's data.[8] Bringing this estimate forward to FY 2019, the projected shortfall from the national average in state and local government appropriations for higher education in is $666 million. The combined shortfall is $5.16 billion without considering fiscal need or the language in the Arizona Constitution.

Since FY 2016 — the base period used to calculate the additional funding needed for elementary and secondary education — appropriations have increased as part of the plan announced in April 2018 to raise teacher pay 20 percent by FY 2021. Appropriations will increase by an estimated $645 million in FY 2021. Applying the full amount to the FY 2019 estimated shortfall leaves an elementary and secondary school need of $3.84 billion. Adding the additional funding for higher education brings the remaining amount needed to reach the national average to $4.51 billion.

Considering fiscal need, the projected shortfall in education funding in Arizona in fiscal year 2019 is $658 million for higher education and $4.33 billion for elementary and secondary education — a total of $4.99 billion. This additional funding will be needed in each subsequent year, adjusted for inflation and changes in enrollment.

While additional annual funding in Arizona in the range of $4.5 billion (not considering fiscal need) to $5 billion (considering fiscal need) for pre-kindergarten through graduate school public education may seem like a very large figure, $5.15 billion in additional revenue for the state's general fund would have been realized in fiscal year 2019 had no changes to tax laws been made since the early 1990s. More than half of the net loss of revenue ($2.61 billion) resulted from tax law changes to the individual income tax, primarily through a series of tax rate reductions. Changes in tax laws affecting the corporate income tax reduced revenue by $975 million.

Moreover, according to the Arizona Joint Legislative Budget Committee, Arizona state government spending in fiscal year 2019 could be $6.1 billion higher without exceeding the appropriations limit. The constitutional appropriations limit is 7.41 percent of personal income and applies to most revenue collected by state government, whether deposited to the general fund or to other funds.

Uses of Additional Funding

The plan to boost teacher pay will narrow Arizona's pay gap from the national average, but not bring Arizona equal to the national average. Using the average teacher salary estimates for fiscal year 2017 from the NEA, Arizona's figure was 20.5 percent below the national average and ranked 44th among the 50 states and the District of Columbia. After adjusting for the cost of living (using the BEA's figures for 2016), Arizona's average was 17.1 percent below the national average and ranked 48th. In fiscal year 2021, Arizona's average teacher pay is slated to be 20 percent higher. However, in the four years between the latest figures and FY 2021, the average

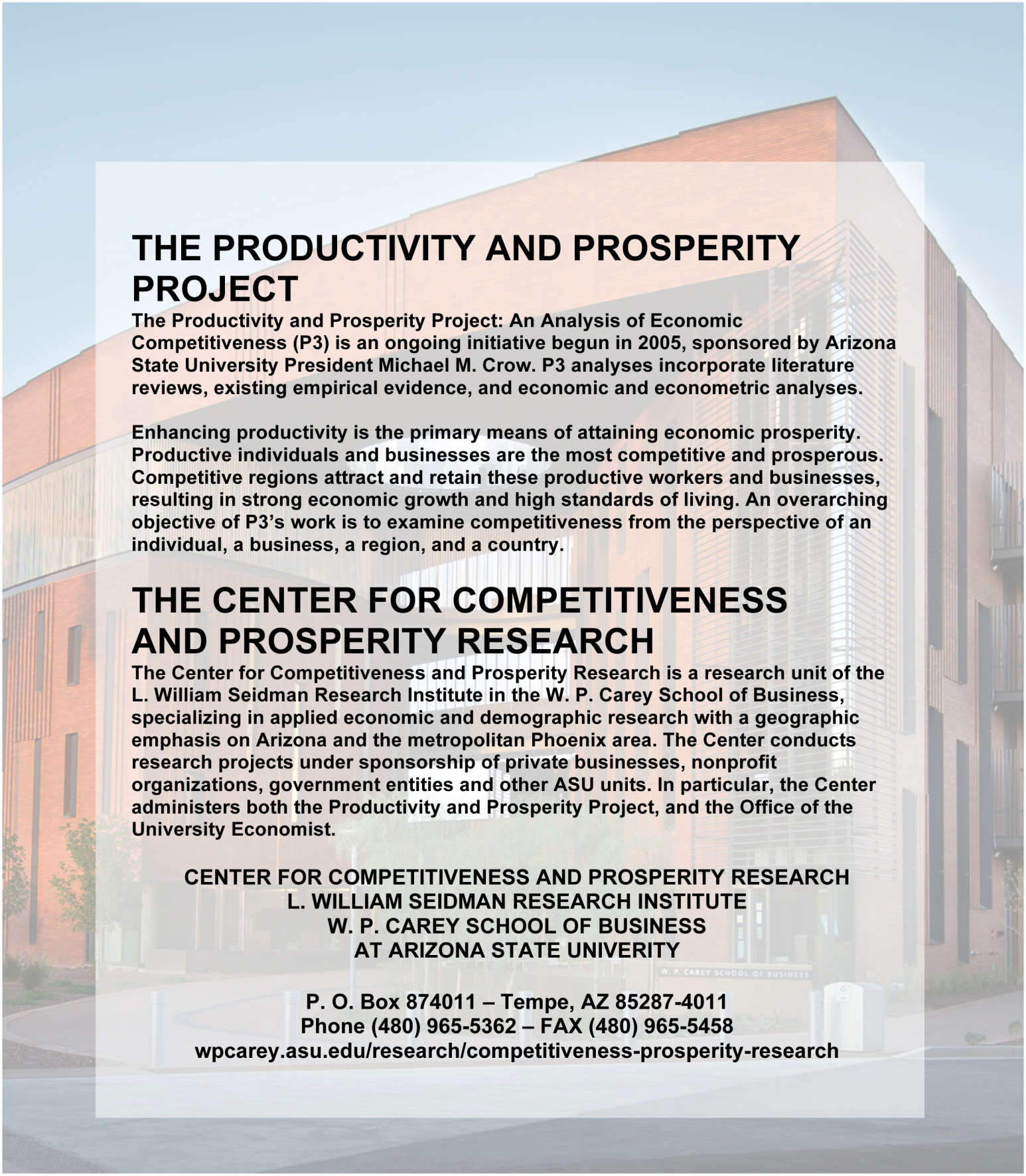
[8] This calculation assumes that Arizona's cost of living in FY 2017 continued to be 4 percent less than the U.S. average.

salary will increase in other states as well, as an adjustment for inflation. Assuming a 2 percent per year increase in each of the other states, Arizona's average teacher salary still will be 11.9 percent below the national average in FY 2021, but will move up to a rank of 29th. After adjusting for the cost of living (assuming that the relative cost differences between states do not change from those estimated for 2016), Arizona's average would be 8.1 percent below the national average and would rank 33rd. The differential from the national average would be cut by more than half and Arizona's rank would improve by 15 from FY 2017.

The Arizona Auditor General (AG) estimates that the average teacher salary in fiscal year 2017 was 2 percent higher than the figure published by the NEA. Substituting the AG figure into the NEA database slightly narrows the FY 2017 difference from the national average and raises Arizona's rank among the states by 4 based on cost-of-living-adjusted data. Basing the 20 percent increase on the AG's figure would leave Arizona's average 6.3 percent below the national average in FY 2021 and ranked 28th. In contrast, using average teacher salary figures from the U.S. Bureau of Labor Statistics (BLS) for May 2017, Arizona's average is further below the national average than using the NEA's data and ranks nearly last in the nation. Based on the BLS data, after the 20 percent increase in FY 2021, Arizona's average teacher salary still would be far below the national average and among the 10 lowest in the nation after adjusting for the cost of living.

While a commitment to boost teacher pay 20 percent by fiscal year 2021 has been made, sustaining this additional funding will be a severe challenge during the next economic downturn, during which state government revenue will fall significantly. Even assuming that appropriations for elementary and secondary education are not reduced, significant funding needs beyond teacher pay are present in elementary and secondary education in Arizona. The $3.8 billion shortfall cited earlier encompasses the need for a much greater number of teachers in order to reduce class size, substantially greater funding for nonteaching staff in the form of higher salaries and an increase in the number of employees, additional funding for supplies (so teachers do not feel the need to purchase supplies with their own money), etc.

According to the SHEEO's data, additional state and local government funding for higher education in Arizona would allow the currently high tuition — particularly in-state tuition at the universities — to be reduced substantially.



THE PRODUCTIVITY AND PROSPERITY PROJECT

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

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

THE CENTER FOR COMPETITIVENESS AND PROSPERITY RESEARCH

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

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