



# BENEFITS FROM IMPROVING EDUCATIONAL ATTAINMENT IN ARIZONA

**August 2012**

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

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ARIZONA STATE UNIVERSITY

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## SUMMARY

The educational attainment of Arizona residents is less, and rising less rapidly, than the U.S. average. Among those of prime workforce age, the state's educational attainment is further below average, with the shortfall to the U.S. average largest in the 25-to-44 age group. Relative to the nation, a lower proportion of Arizonans have earned a bachelor's or graduate degree while a higher percentage have not received a high school diploma or the equivalent.

Earnings are highly correlated to educational attainment. Average earnings of those with a bachelor's degree are 2.6 times higher than those who did not complete high school, 1.8 times higher than high school graduates, and nearly 1.5 times higher than those with some college.

Thus, individuals benefit greatly from increasing their educational attainment, even after netting out the costs of education. The community also benefits from a greater proportion of highly educated residents. Those with more attainment earn more, pay more in taxes, and use public services to a lesser extent. Economic benefits include a higher workforce participation rate, a lower unemployment rate, and higher productivity. The higher productivity of the more highly educated workers enhances the productivity of other workers, causing the average wage of less well-educated workers to be higher than if the workforce had a lesser percentage of highly educated workers.

In order to raise the educational attainment of Arizonans in the workforce and to realize the ensuing benefits, public policy must pursue two goals simultaneously: raising the educational attainment of the state's residents and increasing the proportion of Arizona jobs that pay well and require highly educated workers. Arizona's current job mix is tilted to lower-wage jobs that do not require strong educational attainment. Enhancing educational attainment will not benefit the state if highly educated Arizonans must leave the state to find appropriate jobs.

Businesses consider many factors in determining where to locate and expand. Those businesses that create quality jobs are particularly interested in the quality of the local workforce and the quality of the physical infrastructure. Arizona's physical infrastructure, particularly surface transportation, has many needs. The poor educational outcomes (low achievement and attainment) of those educated in Arizona is a significant deterrent to the creation of quality jobs.

If 6 percent of Arizona residents 25-to-34 years old earn a bachelor's degree instead of having a maximum attainment of some college, the percentages in each educational attainment category would be close to the national average. If the job mix shifts commensurately so that the increased percentage of university graduates could find appropriate jobs within the state, the state's gross domestic product would be \$9 billion higher. The impact would be larger if those earning a bachelor's degree were individuals who otherwise would have ended their education in high school. In addition to this initial impact, lasting economic effects will occur from an increase in the educational attainment of young adults. Throughout their working life of around 40 years, such individuals will be more productive and earn higher wages.

Realistically, it would take a minimum of several years, and likely longer, to raise the percentage of young adults with bachelor's degrees by 6 points and to shift the job mix so that these individuals could find jobs in Arizona.

## **EDUCATIONAL ATTAINMENT AND EARNINGS**

The U.S. Census Bureau is the primary source of information regarding the educational attainment of Americans. Historically, attainment data for states and substate areas primarily came from the long form of the decennial census that was completed by about one-in-six respondents; annual data for the nation was provided by the Current Population Study (CPS), which has a much smaller sample. Since 2005, the annual American Community Survey (ACS) has become the primary source of data for all geographies since the long form of the decennial census has been abandoned and the ACS has a larger sample size than the CPS. (Despite the larger sample, survey error from the ACS remains a significant concern except for the most populous areas.)

Traditionally, the Census Bureau has reported educational attainment primarily for a single group: those at least 25 years of age. On this basis, the educational attainment of Arizona residents has been inferior to, and declining relative to, the national average in recent decades. For many purposes, however, the educational attainment of everyone 25 or older is a less-than-ideal measure. For example, for workforce analyses, those who are retired should be excluded.

The Census Bureau provides lesser educational detail for a few other age groups. A standard table from the ACS provides attainment for the age groups shown in Table 1. Based on the latest data for 2010, this age detail indicates that Arizona's inferior educational attainment is most notable among those 25-to-44 years of age. In contrast, the educational attainment of those 65 or older is higher in Arizona than the U.S. average. The higher attainment of the older population results from net in-migration to Arizona of highly educated individuals after they retire. Since few of these older Arizonans are active in the labor market, the use of the entire 25-or-older age group distorts analyses of the state's educational attainment, at least for issues related to the workforce.

Relative to the nation, a larger share of Arizonans 18-to-24 years old have not received a high school diploma and a lesser percentage have earned a bachelor's degree. However, since many of those in the 18-to-24 age group are still pursuing their education, caution is warranted in interpreting these results.

In contrast, a high proportion of those 25-to-34 years old have completed their education. It is in this age group that Arizona's educational attainment compares most unfavorably relative to the national average. In this age group, as well as in the 35-to-44 age group, the percentage without a high school diploma is higher than the national average and the percentage with at least a bachelor's degree is below average. In these age groups and in the older age groups, a disproportionately large share of Arizonans have attended college but not earned a degree, even an associate's degree.

Educational attainment in the United States continues to rise, with a gain between 2000 and 2010 in the percentage with at least a bachelor's degree and a decrease in the percentage without a high school diploma. Improvements in attainment occurred in each of the age groups between 2000 and 2010 (see Table 2). The educational attainment of Arizonans also is rising, but the gains between 2000 and 2010 generally were inferior to the national average. In each age group, the increase in the proportion earning at least a bachelor's degree was less than the national

**TABLE 1**  
**EDUCATIONAL ATTAINMENT BY AGE, 2010**  
**Percentage of the Total in Each Age Group**

<b>Maximum Attainment</b>	<b>18-to-24</b>	<b>25-to-34</b>	<b>35-to-44</b>	<b>45-to-64</b>	<b>65 or Older</b>
<b>ARIZONA</b>					
Less than 9th grade	2.1%	4.8%	6.0%	5.9%	8.6%
9th to 12th grade, no diploma	17.6	10.1	9.0	6.7	7.6
High school graduate, GED	30.7	24.4	23.3	24.0	29.3
Some college, no degree	39.0	27.9	26.4	27.0	24.4
Associate's degree	4.6	9.0	8.5	8.9	5.5
Bachelor's degree	5.4	17.8	17.8	16.8	14.3
Graduate or professional degree	0.6	5.9	9.0	10.6	10.2
<b>UNITED STATES</b>					
Less than 9th grade	2.3	4.3	4.9	5.1	11.1
9th to 12th grade, no diploma	14.5	8.6	7.7	7.2	11.1
High school graduate, GED	29.4	24.4	25.8	29.0	34.3
Some college, no degree	40.2	23.4	21.6	21.7	18.0
Associate's degree	4.4	8.3	8.7	8.4	4.3
Bachelor's degree	8.5	22.0	20.0	17.3	11.9
Graduate or professional degree	0.6	9.0	11.3	11.2	9.4
<b>DIFFERENCE</b>					
Less than 9th grade	-0.2	0.5	1.1	0.8	-2.5
9th to 12th grade, no diploma	3.1	1.5	1.3	-0.5	-3.5
High school graduate, GED	1.3	0.0	-2.5	-5.0	-5.0
Some college, no degree	-1.2	4.5	4.8	5.3	6.4
Associate's degree	0.2	0.7	-0.2	0.5	1.2
Bachelor's degree	-3.1	-4.2	-2.2	-0.5	2.4
Graduate or professional degree	0.0	-3.1	-2.3	-0.6	0.8

Source: U.S. Department of Commerce, Census Bureau, 2010 American Community Survey.

average (and in the older age groups, the declines in the percentage without a high school diploma were not as large). Thus, the educational attainment of Arizonans continues to fall further below average.

Because of the mobility of the population, the educational attainment figures only partially reflect the educational experience of those who were educated in the area. For example, some who receive their education in Arizona leave the state as adults, while others move to the state after their education is completed. In particular, Arizona experiences significant in- and out-migration of young adults (particularly between the ages of 18 and 29).

The Census Bureau reports earnings by educational attainment only for the entire 25-or-older age group. Earnings, which include salaries, wages and self-employment income, are very highly correlated to educational attainment, as seen in Chart 1. Those without earnings — those not

**TABLE 2**  
**EDUCATIONAL ATTAINMENT BY AGE, CHANGE BETWEEN 2000 AND 2010**  
**Change in the Percentage of the Total in Each Age Group**

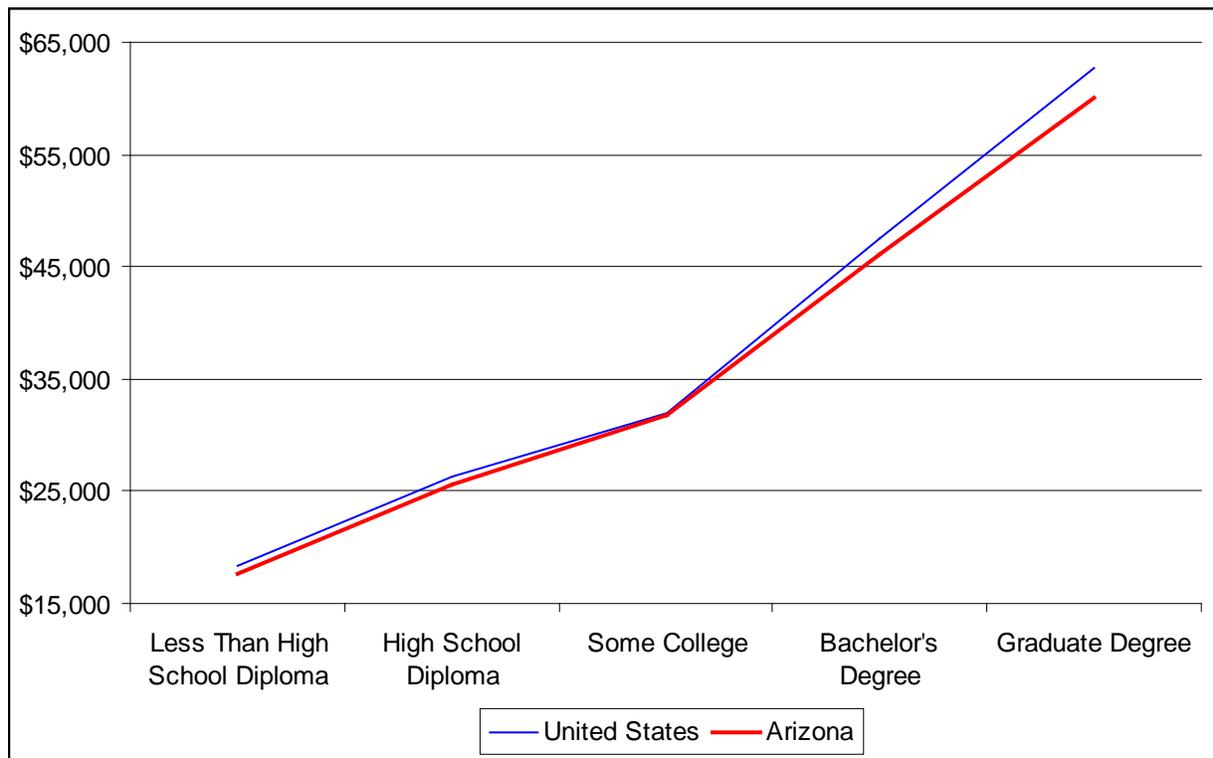
Maximum Attainment	18-to-24	25-to-34	35-to-44	45-to-64	65 or Older
<b>ARIZONA</b>					
Less than 9th grade	-4.4	-2.1	-0.8	-1.0	-2.8
9th to 12th grade, no diploma	-6.7	-3.8	-1.6	-1.7	-5.9
High school graduate, GED	3.6	1.8	0.0	1.1	-0.4
Some college, no degree	6.3	1.4	-0.9	-0.7	1.5
Associate's degree	0.9	1.9	0.3	1.4	2.2
Bachelor's degree	0.1	0.4	1.7	1.5	3.1
Graduate or professional degree	0.2	0.5	1.3	-0.6	2.3
<b>UNITED STATES</b>					
Less than 9th grade	-1.7	-0.5	0.3	-1.2	-5.7
9th to 12th grade, no diploma	-6.8	-2.8	-2.7	-3.4	-6.7
High school graduate, GED	0.9	-1.4	-2.6	0.4	2.4
Some college, no degree	5.9	0.3	-1.0	0.0	2.3
Associate's degree	0.4	0.8	0.6	2.0	1.8
Bachelor's degree	1.3	1.7	2.8	2.4	3.0
Graduate or professional degree	0.1	1.8	2.6	-0.2	3.0
<b>DIFFERENCE</b>					
Less than 9th grade	-2.7	-1.6	-1.1	0.2	2.9
9th to 12th grade, no diploma	0.1	-1.0	1.1	1.7	0.8
High school graduate, GED	2.7	3.2	2.6	0.7	-2.8
Some college, no degree	0.4	1.1	0.1	-0.7	-0.8
Associate's degree	0.5	1.1	-0.3	-0.6	0.4
Bachelor's degree	-1.2	-1.3	-1.1	-0.9	0.1
Graduate or professional degree	0.1	-1.3	-1.3	-0.4	-0.7

Source: U.S. Department of Commerce, Census Bureau, 2010 American Community Survey and 2000 decennial census.

active in the labor force — are not included in the calculation of median earnings, but those working part time are included.

Relative to the overall median earnings of \$33,298 nationally in 2010, those whose maximum educational attainment was less than a high school diploma earned 45 percent less, those with a high school diploma earned 21 percent less, those with some college (in this case, including those with an associate's degree) earned 4 percent less, those with a bachelor's degree earned 42 percent more, and those with a graduate degree earned 88 percent more. Median earnings of those with a bachelor's degree were 2.6 times higher than those without a high school diploma, 1.8 times higher than those whose maximum attainment is a high school diploma, and nearly 1.5 times higher than those with some college.

**CHART 1  
 MEDIAN EARNINGS OF THOSE 25 OR OLDER  
 BY MAXIMUM EDUCATIONAL ATTAINMENT, 2010**



Source: U.S. Department of Commerce, Census Bureau, 2010 American Community Survey.

Median earnings by educational attainment of Arizona residents are similar to the national average. By attainment category, Arizona’s median earnings in 2010 ranged from 1-to-4 percent less than the national average.

It is because of this very strong relationship between enhanced educational attainment and earnings that educational attainment is so important. The benefits of education to individuals are obvious, in the form of much higher earnings. Even after considering the costs of a university education — tuition, fees, government appropriations, and foregone earnings while a student — the average individual is much better off obtaining a bachelor’s degree. A 2005 Seidman Institute study (“The Value of Higher Education: Individual and Societal Benefits” <http://economist.asu.edu/p3/education>) found the net present value of a bachelor’s degree to exceed a quarter-million dollars, with an internal rate of return of nearly 12 percent.

The benefits to the community also are substantial. Since those with higher educational attainments have much higher earnings, they pay considerably more in state and local taxes than those with less attainment. Those with earnings well above the median pay for the public services they consume, while those with lower earnings are a net drain on the public sector. As a group, those with high educational attainment have much lesser demands on public welfare than those with less education and lower earnings. The highly educated commit substantially fewer crimes, are more civically involved, and provide a variety of other social benefits.

A more highly educated populace also provides significant economic benefits. The labor force participation rate rises, and the unemployment rate falls, with increasing educational attainment. Nationally in June 2012 among those 25 or older, the labor force participation rate rose from 45 percent among those who had not graduated from high school to 60 percent among high school graduates to 69 percent among those with some college to 76 percent among those with at least a bachelor's degree. In contrast, the unemployment rate dropped from 12.6 percent among those without a high school diploma to 8.4 percent among high school graduates to 7.5 percent among those with some college to only 4.1 percent among those with at least a bachelor's degree. Thus, despite the weak economy, university graduates were near full employment and had a substantially lower unemployment rate than even those with some college.

Those who are more highly educated are more productive than other workers. Productivity is the key to prosperity, with a direct relationship between productivity increases and rising wages. Not only are highly educated and skilled workers more productive and more highly paid, their presence in an economy raises the productivity of less highly educated and skilled workers, which leads to higher wages for these other workers.

Thus, in addition to the social benefits, there are substantial economic benefits to the community from building an economy with a high proportion of highly educated and skilled workers. Therefore, modern economic development focuses simultaneously on ensuring that the local workforce is educated and skilled and on attracting or creating jobs suitable for workers with high educational attainments.

### **Educational Attainment of Those 25-to-34 Years Old**

The educational attainment of those 25-to-34 years old often is highlighted. Most individuals in this age group have completed their educations and since they have done so recently, their attainment provides insight into the success of those educated locally.

The educational attainment of Arizonans 25-to-34 years old is summarized in Table 3. In 2010, Arizona had a much lower share than the national average of residents with at least a bachelor's degree, ranking 44th among the 51 "states" (including the District of Columbia). In contrast, the state had higher-than-average shares of those without a high school diploma and those with some college (which in this table includes those with an associate's degree).

Between 2000 and 2010, the decline in the percentage without a high school diploma was greater than the national average, but the increase in the share with at least a bachelor's degree was considerably less than the U.S. average, ranking 48th.

Of those living in the United States in 2010 who were between 25 and 34 years of age, 31.1 percent had earned at least a bachelor's degree. Among the 51 states, only 18 had a percentage higher than the national figure. Each of the top seven states, and nine of the top 12, are located along the East Coast, stretching from New Hampshire to Virginia. Only in one western state was the percentage with a bachelor's degree higher than the U.S. average: Colorado ranked 10th at 36.1 percent. Arizona ranked 44th at 23.7 percent. Among 10 western states, Arizona ranked seventh, with a higher percentage than Idaho, Nevada and New Mexico. The percentage in Colorado, California, Oregon, Utah and Washington was considerably higher than in Arizona.

**TABLE 3**  
**EDUCATIONAL ATTAINMENT OF THOSE 25-TO-34 YEARS OLD IN ARIZONA**

<b>Maximum Attainment</b>	<b>Percentage of the Total</b>	<b>Difference from National Average</b>	<b>Rank Among 51 States</b>
<b>2010</b>			
No High School Diploma	14.9%	2.1	9
High School Graduate	24.4	0.0	30
Some College	37.0	5.4	10
Bachelor's Degree or More	23.7	-7.4	44
<b>2000-to-2010 Change</b>			
No High School Diploma	-5.9	-2.6	49
High School Graduate	1.8	3.2	2
Some College	3.2	2.1	5
Bachelor's Degree or More	0.9	-2.6	48

Source: U.S. Department of Commerce, Census Bureau, 2010 American Community Survey and 2000 decennial census.

Arizona's low rank nationally and in the West on the educational attainment of those from 25-to-34 years of age results in part from the large number of relatively uneducated undocumented immigrants who moved to the state as young adults, particularly from the mid-1990s through the mid-2000s. Children of undocumented immigrants, whether born in the United States or in their home country, also have relatively low educational attainment.

The educational attainment of Arizona residents also is affected by the many residents who migrated to the state from elsewhere in the United States after completing their education. In contrast, some who were educated in Arizona were living outside the state in 2010.

## **IMPROVING EDUCATIONAL ATTAINMENT**

With Arizona's "employer sanctions" law likely to greatly restrict the number of undocumented immigrants entering the state, the state should experience a faster rise in the share of young adults with a university degree than over the last decade. Instead of continuing to lose ground relative to the national average, the state may hold its current position. However, for the state's educational attainment to rise relative to the nation and to other states, Arizona will need to implement policies designed to improve the educational attainment of its residents.

To be successful, any such initiative must simultaneously address labor force supply and demand. If the state were to focus only on the education of its residents, it would produce a larger number of highly educated people than could find jobs in Arizona, given the state's substandard job quality. Thus, many of the highly educated would leave the state to find appropriate jobs, resulting in limited gains in educational attainment among Arizona residents. In contrast, if the state were to focus only on economic development, then the low educational achievement and attainment of those growing up in the state and entering the workforce would cause job growth to be less than its potential and/or would disproportionately consist of low-wage jobs. In either case, educational attainment of Arizona residents would not rise much.

While recent legislative actions have lowered the business tax burden, making the state more competitive in economic development in that one dimension, tax policy is just one of many location factors considered by companies. In particular, the poor educational outcomes (low achievement, such as measured by test scores, and low attainment) of those educated in Arizona and the substandard physical infrastructure (particularly the surface transportation system) are significant hindrances to economic development, at least to companies providing quality jobs.

If the state were to invest in itself by making substantial improvements to its physical infrastructure and by implementing programs to improve educational achievement and attainment, starting with preschool and extending through graduate school, it would be certain to realize positive long-term effects in economic development and in a variety of societal measures. However, the benefits would be slow to be realized. A measure such as the percentage of the population earning a university degree is very slow to respond to policy decisions. Without considering other factors that will slow the transition to a more educated populace, a bachelor's degree is rarely earned until 17 years of schooling are completed.

### **Simulation**

The remainder of this section demonstrates the economic effects that would be realized in Arizona if the proportion of young adults with a university degree were increased and a proportionate number of quality jobs were created. The simulation assumes that a portion of those 25-to-34 years old who have attended college without earning a degree had instead completed their bachelor's degree. A swing of 6 percentage points is modeled, based on the increase needed for Arizona's proportion with at least a bachelor's degree to reach the level of the median state in the 25-to-34 age group. Specifically, the percentage with at least a bachelor's degree would rise from 23.7 percent to 29.7 percent, which still would be slightly below the national average of 31.1 percent. The proportion with some college would fall from 37.0 percent to 31.0 percent, leaving that proportion slightly below the national average of 31.6 percent.

In order to obtain the necessary data, the Public Use Microdata Sample (PUMS) from the ACS is used. Because of the small sample in the annual PUMS, the last five years (2006 through 2010) of ACS data are combined. The workforce participation rate and earnings during this period were adversely impacted by the long and deep recession of 2008 and 2009.

The analysis of the ACS PUMS data focuses on those working full time and year round, defined as at least 35 hours a week for at least 50 weeks in the prior 12-month period. This subset of the employed population represented 40 percent of the entire population of those at least 16 years of age in Arizona. Mean earnings, expressed in 2010 dollars, were slightly more than \$50,000. (Because of the very high earnings of a few, the mean is higher than the median.)

The employment-to-population ratio increased with educational attainment in each age group. It also rose with age to its peak in the 35-to-44 and 45-to-54 age groups. Mean earnings also increased with educational attainment in each age group and climbed with age to its peak among those 45-to-54 years of age.

Among those 25-to-34 years old in Arizona, mean earnings were a little more than \$39,000 for those with some college and close to \$56,000 for those with at least a bachelor's degree (a 42 percent differential). The workforce participation rate was slightly less than 57 percent among those with a maximum educational attainment of some college (including associate's degrees) and more than 63 percent among those with at least a bachelor's degree.

Thus, the direct economic benefits from increasing the share of university graduates derive from two sources: the higher earnings and the higher employment rate of university graduates. Based on this analysis of ACS data, an increase in the share of university graduates net of the decrease in share of those with some college would result in a net increase in earnings of \$668 million (a 4 percent increase in aggregate earnings of those 25-to-34 years old, but less than a 1 percent gain in the earnings of the entire population). The increase results from an employment gain of 3,400 (arising from the higher workforce participation rate among those with at least a bachelor's degree versus those with some college) and from 42 percent higher average earnings among the 51,200 individuals who would raise their maximum educational attainment from some college to a bachelor's degree.

A larger benefit results from the "spillover" effects of increasing the percentage of workers with university degrees. The more educated workforce leads to increases in productivity among all workers, which in turn results in wage increases for all workers. According to research conducted by Enrico Moretti ("Estimating the Social Return to Higher Education: Evidence From Longitudinal and Repeated Cross-Sectional Data," *Journal of Econometrics*, July/August 2004, pages 175-212), a 1 percentage point increase in the share of university graduates increases the wages of all workers, by 1.9 percent for those without a high school diploma, by 1.6 percent for those with either a high school diploma or some college, and by 0.4 percent for university graduates.

A 6 percentage point increase in the share of university graduates in the 25-to-34 age group equates to an increase of 2.63 percentage points in the share of university graduates among the

entire workforce. Based on this percentage and Moretti's estimated gains in earnings, the earnings in the Arizona economy would be \$2,726 million higher.

Combining the direct benefit of \$668 million and the "Moretti" effect of \$2,726 million, the total increase in earnings in the Arizona economy would be \$3.394 billion (3.53 percent). This figure is based on the sample data from the ACS that applies only to full-time, year-round workers.

To provide a more comprehensive measure of the economic effects of increasing the percentage of university graduates in the workforce, data reported by the U.S. Department of Commerce's Bureau of Economic Analysis (BEA) were examined for the same 2006-to-2010 period. The sum of wage and salary disbursements and proprietors' income reported by the BEA is conceptually equivalent to earnings reported in the ACS. The broadest measure of the economy is gross domestic product (GDP). After adjustment for inflation, wage and salary disbursements and proprietors' income averaged \$131.799 billion and GDP averaged \$254.567 billion over these five years. Wage and salary disbursements and proprietors' income accounted for 51.77 percent of GDP. Applying the 3.53 percent increase in earnings computed from the ACS data that would result from the increase of 2.63 percentage points in the full-time year-round workforce with a bachelor's degree to the BEA's comprehensive measure of wage and salary disbursements and proprietors' income, the total increase would be \$4.653 billion in Arizona. Dividing this increase by 0.5177, GDP would rise by nearly \$9 billion (3.5 percent).

Though this analysis is based on data from 2006 through 2010, the average GDP and earnings figures for this period are likely to be quite close to the figures for 2012, after adjustment for inflation. Thus, if the percentage of Arizona's workers between the ages of 25 and 34 with at least a bachelor's degree were to suddenly rise 6 percentage points, taken from the ranks of those with some college, the impact on the economy is estimated to be \$4.65 billion on earnings and \$9 billion on GDP. The impact would be larger if those earning a bachelor's degree were individuals who otherwise would have ended their education in high school.

In addition to this initial impact, lasting economic effects will occur from an increase in the educational attainment of young adults. Throughout their working life of around 40 years, such individuals will be more productive and earn higher wages.

Such an increase in educational attainment would have to be accompanied by a substantial shift in the job mix to higher-quality jobs. Such changes cannot occur instantaneously. For perspective on how long it might take to achieve such improvements, the actual rate of increase in educational attainment between 2000 and 2010 is examined. Nationally, the share of the workforce with a bachelor's degree or more has been rising an average of about 0.3 percentage points per year. In Arizona, the average gain has been only half as much. The simulated increase of 2.6 percentage points in Arizona that would put Arizona near the median state and a little short of the national average is in addition to whatever increase occurs nationally. For example, if the gain nationally remains at 0.3 per year and Arizona's increase in the share of university graduates were to rise to 0.5 per year (more than three times as much as between 2000 and 2010), it would take 13 years for Arizona's increase in educational attainment relative to the nation to cumulate to 2.6 percentage points. If Arizona's gain was to average 0.9 percentage points per year, triple the U.S. average and six times higher than in Arizona between 2000 and

2010, it would take between six and seven years for Arizona's figure to rise 2.6 percentage points relative to the national average.

**APPENDIX: CHARACTERISTICS OF ARIZONA'S WORKFORCE,  
WITH COMPARISONS TO THE NATION**

This appendix is based on the analysis of ACS PUMS data for the years from 2006 through 2010. It focuses on workforce participation rates, earnings, and educational attainment of full-time, year-round workers, with comparisons to the entire population and/or entire workforce.

Educational attainment is summarized in Table A-1. Figures are provided for the entire population — including those working full time and year round, those working part time and/or seasonally, and those not in the labor force — and for full-time, year-round workers. For both groups, attainment in Arizona was less than the national average in each age group under the age of 55, with the percentage of those without a high school diploma higher, and the share with at

**TABLE A-1  
EDUCATIONAL ATTAINMENT, AVERAGE FROM 2006 THROUGH 2010**

	Age Group						
	16+	16-24	25-34	35-44	45-54	55-64	65+
<b>ARIZONA</b>							
Population							
Less Than High School Diploma	18.9%	38.1%	16.3%	15.6%	13.6%	11.3%	18.2%
High School Diploma	25.1	25.2	24.8	23.4	24.3	23.0	29.6
Some College	33.2	31.4	34.2	33.6	35.7	35.8	28.7
Bachelor's Degree or More	22.8	5.3	24.7	27.5	26.4	29.9	23.6
Full-Time, Year-Round Workers							
Less Than High School Diploma	10.8	16.4	11.9	11.0	9.2	7.6	11.2
High School Diploma	23.6	34.5	23.2	22.0	23.2	20.9	23.0
Some College	36.4	39.3	35.9	35.3	36.9	37.2	33.5
Bachelor's Degree or More	29.2	9.9	29.1	31.7	30.8	34.3	32.3
<b>ARIZONA, DIFFERENCE FROM NATIONAL AVERAGE</b>							
Population							
Less Than High School Diploma	0.7	3.4	3.1	3.0	1.5	-1.6	-6.1
High School Diploma	-3.3	0.1	-0.5	-3.6	-5.4	-5.6	-4.8
Some College	4.2	-1.8	3.7	4.0	5.5	7.0	7.5
Bachelor's Degree or More	-1.7	-1.8	-6.3	-3.2	-1.6	0.3	3.6
Full-Time, Year-Round Workers							
Less Than High School Diploma	1.9	4.0	2.9	2.2	1.2	-0.5	-1.6
High School Diploma	-3.2	-2.0	-0.2	-3.8	-5.2	-5.3	-5.1
Some College	5.1	2.3	4.7	4.5	5.5	6.8	7.5
Bachelor's Degree or More	-3.8	-4.2	-7.4	-2.9	-1.4	-1.0	-0.8

Source: U.S. Department of Commerce, Census Bureau, 2010 five-year American Community Survey, Public Use Microdata Sample.

least a bachelor's degree lower, than the U.S. average. The educational attainment of those working full time and year round was substantially higher than that of the entire population in each age group in Arizona, but was considerably less than the attainment of full-time, year-round workers nationally. In the age groups under the age of 35, the shortfall from the national average was greater among full-time, year-round workers than among the entire population.

Labor force participation rates are displayed in Table A-2. The participation rate is calculated in two ways: based on the percentage of individuals with any earnings over the last 12 months, and the percentage who worked at least 35 hours per week for at least 50 weeks over the last year. For both definitions, the labor force participation rate rose with educational attainment in each age group. Among all workers, the highest participation rates generally were in the 35-to-44 age group, but the rates were nearly as high in the 25-to-34 and 45-to-54 age groups. Among those

**TABLE A-2**  
**LABOR FORCE PARTICIPATION RATE, AVERAGE FROM 2006 THROUGH 2010**

	Age Group					
	16-24	25-34	35-44	45-54	55-64	65+
<b>ARIZONA</b>						
All Workers						
Less Than High School	42.4%	67.1%	67.8%	64.0%	48.2%	9.9%
Diploma						
High School Diploma	75.1	78.6	79.1	77.4	57.6	13.6
Some College	81.3	85.6	85.7	83.0	65.2	19.5
Bachelor's Degree or More	89.9	90.8	90.0	89.7	73.1	24.2
Full-Time, Year-Round Workers						
Less Than High School	9.5	39.3	40.6	38.5	27.2	3.6
Diploma						
High School Diploma	30.1	50.6	54.1	54.6	36.6	4.5
Some College	27.5	56.7	60.5	59.2	41.8	6.8
Bachelor's Degree or More	41.4	63.4	66.4	66.6	46.1	8.0
<b>ARIZONA, DIFFERENCE FROM NATIONAL AVERAGE</b>						
All Workers						
Less Than High School	-0.7	-2.0	-2.0	0.4	1.5	-0.4
Diploma						
High School Diploma	-1.4	-2.3	-2.7	-2.0	-4.1	-2.2
Some College	2.5	-1.5	-1.1	-1.8	-4.4	-3.0
Bachelor's Degree or More	0.9	-0.8	0.0	-1.0	-5.4	-4.7
Full-Time, Year-Round Workers						
Less Than High School	2.9	2.1	-0.5	-0.2	-0.1	0.1
Diploma						
High School Diploma	3.5	-0.2	-2.0	-1.4	-3.3	-0.9
Some College	7.1	0.8	-0.8	-1.8	-4.2	-1.4
Bachelor's Degree or More	5.1	-1.0	0.2	-0.9	-5.9	-3.0

Source: U.S. Department of Commerce, Census Bureau, 2010 five-year American Community Survey, Public Use Microdata Sample.

working full time and year round, the participation rates in the 25-to-34 age group were a little lower than those in the 35-to-44 and 45-to-54 groups.

Among full-time, year-round workers, the labor force participation rate was higher in Arizona than nationally in each educational attainment category in the 16-to-24 age group. Except among those without a high school diploma, the rates in Arizona were lower than the national average in the two oldest age groups. Among the primary working ages of 25 to 54, participation rates in Arizona ranged from above to below the national average across the various age/educational attainment categories, but averaged somewhat below average.

Compared to the nation, a lesser proportion of Arizonans worked part time and/or seasonally in most of the age/attainment categories, especially among those 16 to 24 and 65 or older. Considering all individuals who had earnings during the last 12 months, the workforce participation rates in Arizona were below the national average in 19 of the 24 age/attainment categories. The overall rates in the 25-to-54 age group were further below average than among those working full time and year round.

Mean earnings, expressed in 2010 dollars, are shown in Table A-3. As expected, mean earnings of full-time, year-round workers were higher than those of all workers. For both sets of workers, earnings rose substantially with educational attainment in each age group. The largest increase with attainment occurred between the some college and university graduate categories. The highest earnings were among those 45-to-54 years old.

Concentrating on the earnings of full-time, year-round workers, the mean in Arizona was less than the national average in each age group among those without a high school diploma and among each age group other than 16 to 24 for those with at least a bachelor's degree. In contrast, the mean earnings of those with a high school diploma and those with some college were equal to, or a little higher than, the national average in each age category under the age of 55.

**TABLE A-3  
MEAN EARNINGS IN THOUSANDS, AVERAGE FROM 2006 THROUGH 2010**

	Age Group					
	16-24	25-34	35-44	45-54	55-64	65+
<b>ARIZONA</b>						
All Workers						
Less Than High School	\$ 8.0	\$20.5	\$24.1	\$26.0	\$24.1	\$19.6
Diploma						
High School Diploma	14.1	26.9	32.8	37.0	32.8	21.1
Some College	14.2	32.3	41.5	44.3	41.4	26.2
Bachelor's Degree or More	24.1	47.6	70.8	77.3	67.8	44.7
Full-Time, Year-Round Workers						
Less Than High School	20.0	25.9	30.0	31.7	30.8	29.0
Diploma						
High School Diploma	23.7	33.2	39.4	43.8	40.3	34.1
Some College	25.3	39.2	49.4	52.1	51.3	42.5
Bachelor's Degree or More	35.0	55.7	81.5	88.4	85.1	79.0
<b>ARIZONA, PERCENTAGE DIFFERENCE FROM NATIONAL AVERAGE</b>						
All Workers						
Less Than High School	-7%	3%	-1%	-1%	-6%	1%
Diploma						
High School Diploma	12	3	0	4	-2	-6
Some College	25	5	2	0	-2	-10
Bachelor's Degree or More	11	-3	-4	-5	-9	-17
Full-Time, Year-Round Workers						
Less Than High School	-1	-9	-3	-3	-6	-10
Diploma						
High School Diploma	5	2	0	4	-2	-13
Some College	6	3	3	0	-1	-14
Bachelor's Degree or More	1	-3	-5	-5	-6	-13

Source: U.S. Department of Commerce, Census Bureau, 2010 five-year American Community Survey, Public Use Microdata Sample.

# 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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