THE IMPACT OF ARIZONA STATE UNIVERSITY GRADUATES EMPLOYED IN ARIZONA IN 2020

A Report from the Office of the University Economist

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SUMMARY

Arizona State University (ASU) graduates are employed throughout the world. This paper examines only those graduates employed in Arizona — those contributing to the productivity and prosperity of the state.

Approximately 266,716 ASU graduates were working in Arizona in 2020. More than one-in-four of the state's working individuals who had earned at least a bachelor's degree had graduated from ASU. The aggregate earnings of the ASU graduates were around $18.6 billion. Based on these earnings, these individuals contributed between $1.32-and-$1.58 billion in state and local government taxes, including between $803 million and $964 million in state government taxes, depending on the tax rate assumed.

The estimate of the number of ASU graduates working in Arizona in 2020 is based on actual employment and wage data for 180,707 individuals who graduated from ASU between 1990 and 2020 and were covered by the state's unemployment insurance program. Estimates of those who graduated from ASU prior to 1990 and of ASU graduates who were not covered by the unemployment insurance program but were working in Arizona in 2020 were added to the 180,707 figure to reach the total of approximately 266,716.

The impact of ASU graduates working in Arizona increased between 2012 and 2014 and was little changed between 2014 and 2016; it increased again in 2017, 2018, 2019, and 2020. The share of the Arizona workforce who were ASU graduates was 6.17 percent in 2012 and increased to 6.97 percent in 2020. The share of aggregate wages earned by ASU graduates increased from 8.28 percent in 2012 to 9.23 percent in 2020. The average wage of ASU graduates climbed from 134.3 percent of the average wage of all workers in 2012 to 137.9 percent in 2019, but decreased to 132.5 percent in 2020. In 2012, graduates of ASU accounted for 25.6 percent of all Arizona workers who had earned at least a bachelor's degree. This percentage increased to 26.9 percent in 2014 and 2015, then dropped to 25.9 percent in 2016, and to 25.6 percent in 2017 and 2018. It slightly increased to 25.7 percent in 2019, and increased to 26.4 percent in 2020.

DESCRIPTION OF DATA

University Graduates Employed in Arizona

For each year from 2012 through 2020, the Arizona Board of Regents (ABOR) has created a dataset of graduates of Arizona's three public universities who were employed in Arizona during the year. While the ABOR dataset includes the number of "degrees awarded," this number really refers to the number of individuals earning a degree. An individual earning more than one degree is counted only once in this dataset, categorized in the year of the most recent degree. Thus, the dataset's number of "degrees awarded" is less than the official number of degrees awarded.

The ABOR dataset is created by matching Social Security numbers of university graduates to the numbers in the unemployment insurance file maintained by the Arizona Department of Economic Security, which works in conjunction with the U.S. Department of Labor. Reporting from the unemployment insurance file — the Quarterly Census of Employment and Wages (QCEW) — is done quarterly, with annual average figures also produced.

Each quarter, every business that employs workers covered by the state's unemployment insurance program must report (1) employment in each of the three months of the quarter during the pay period that includes the 12th day of the month and (2) total wages paid by the business during the quarter. Federal government civilian workers covered by the comparable federal unemployment insurance program also are included in the reporting.

Various members of the workforce are not included in the QCEW: most agricultural workers on small farms, those self-employed, those in the Armed Forces, and various others. Reporting is by job, not by individual — an individual working more than one covered job will appear in the file more than once.

Since the unemployment insurance records are confidential, ABOR's dataset of graduates employed in Arizona includes only aggregate totals. There are two significant limitations to this dataset. First, the unemployment insurance file does not include a significant number of workers — in 2020, the employment count from the unemployment insurance file was only 74 percent of the total employment in Arizona, as reported by the U.S. Bureau of Economic Analysis (BEA). Second, the dataset of graduates employed in Arizona constructed by the Board of Regents only includes graduates since 1990. Thus, the number of graduates of Arizona's public universities who are working in Arizona is understated significantly. This understatement effectively becomes even larger when the number of *individuals* counted in the Board of Regents dataset is compared to the total number of *jobs* reported in the QCEW.

The dataset constructed by the Board of Regents is subdivided by various characteristics:

- university
- bachelor's degrees versus graduate degrees
- those who attended school as Arizona residents versus nonresidents

The analysis described in this paper uses a dataset specific to Arizona State University (ASU) provided by ASU's Office of the University Provost.

By year of graduation, the following data items are available from the dataset of university graduates employed in Arizona:

- number of graduates
- number employed in Arizona (in any quarter during the year)
- percent of graduates employed in Arizona
- total and median wages of graduates employed in Arizona
- estimated state taxes paid by graduates employed in Arizona
- number employed in Arizona in all four quarters
- total and median wages of those employed in Arizona in all four quarters

The number of graduates is reported by academic year — for example, for 2020, the sum of the number graduating in August 2019, December 2019, and May 2020. The employment data are for calendar year 2020.

While the median wage of those employed in all four quarters is a reasonable measure of the typical annual wage of graduates included in the dataset, use of the median wage is arithmetically quite limited. Thus, the average wage of those employed in any quarter during the year also is calculated, as total wages divided by the total number employed.

Employment

The employment figures reported in the QCEW are based on a census of all covered workers and therefore are highly accurate, but as noted above, a large number of workers are not covered by the unemployment insurance program. Thus, focusing only on those covered by the program significantly understates the contribution of university graduates to the Arizona economy.

Employment estimates are available from several sources, but these estimates are not consistent due to definitional differences (certain categories of workers may be excluded by one source but not by another), differences in the way the data are collected (such as a sample of employers versus a census), and timing differences in when the data are collected. In order to provide a more complete picture of the economic activity in Arizona of ASU graduates, more complete employment estimates from the BEA are used in this report.

Most of the employment estimates, including those of the QCEW and BEA, do not differentiate between a person working full time and one working fewer hours. Employment is categorized by the place of work, not by where the worker lives. For example, an Arizona resident of Bullhead City who works across the Colorado River in Laughlin, Nevada is counted in the Nevada employment figures. Further, most of the employment estimates report the number of jobs, not the number of people employed — an individual working two jobs is counted twice in the employment figures. This is an important distinction when comparing the number of ASU graduates (individuals) employed in Arizona to total employment (number of jobs).

Unlike other employment estimates, the employment data reported from the American Community Survey (ACS) reflects the number of individuals working and workers are classified by place of residence. The ACS is an ongoing survey of households conducted by the U.S. Census Bureau that is the source of a wide variety of socioeconomic data. The main shortcoming of the ACS is that it is based on a relatively small number of households. Sampling error can be a

significant concern. The accuracy of self-reporting, particularly for questions related to wages and income, also is an issue. Various ACS tables provide insight on employment in Arizona. The ACS employment figures are based on an individual's employment status at the time the questionnaire is completed.

Educational Attainment

In order to provide context on the contribution of ASU graduates employed in Arizona, the educational attainment of the Arizona workforce is examined. The ACS is the best source of data on educational attainment at a subnational level. In this report, Arizona's educational attainment is compared to the nation using three ACS tables: attainment for the population age 25 and older, attainment in each of five age groups, and attainment by labor force status among those 25-to-64 years old.

While ACS data for five years often are combined to reduce sampling error, the ACS data from 2019 are used in this analysis in order to be consistent with the Board of Regents dataset. For Arizona, sampling error for a single year of ACS data ranges from insignificant for broad measures to significant for small subsets of the population. Thus, the attainment data for the entire population at least 25 years of age is more reliable than the data for each of five age groups.

The Impact of College Graduates on the Workforce

Educational attainment is strongly correlated to an individual's earnings, with a bachelor's degree in particular causing a boost in earnings. The higher earnings realized over a lifetime of work greatly exceeds the costs of attending college.[1] Society also benefits from an educated populace in various ways, such as the lower crime rates of educated individuals.[2]

One of the benefits of having highly educated individuals in the workforce is to raise the wages of the entire workforce. Enrico Moretti specified this relationship in his 2004 *Journal of Econometrics* paper, "Estimating the Social Return to Higher Education: Evidence From Longitudinal and Repeated Cross-Sectional Data."[3] The spillover of benefits to all workers can be traced to the enhanced worker productivity associated with greater educational attainment. Improved productivity results from the sharing of knowledge and skills across workers and from shifts in the industrial mix to knowledge-based activities. These productivity gains translate into higher output and earnings.[4]

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[1] See "Has the Return to Investing in a College Education Declined?," December 2013, and earlier papers at http://economist.asu.edu/p3/education.

[2] See "Benefits From Improving Educational Attainment in Arizona," August 2012, and earlier papers at http://economist.asu.edu/p3/education.

[3] Accessible from http://economist.asu.edu/p3/education.

[4] See "The Economic Impact of Raising the Educational Attainment of Arizona's Workforce; 2019 Update," July 2019, at https://economist.asu.edu/p3/education.

ARIZONA STATE UNIVERSITY GRADUATES EMPLOYED IN ARIZONA IN 2020

Employment

According to the QCEW, annual average Arizona employment in 2020 totaled 2,823,760. The BEA's wage and salary employment estimate was 2,967,485, meaning that 143,725 wage and salary workers were not covered by unemployment insurance. The BEA estimates that the number of proprietors (self-employed, also not included in the QCEW) was 858,677, for a total employment figure of 3,826,162.

According to the ACS, an estimated 3,305,302 Arizonans were employed in 2019[5] in civilian jobs; an additional 24,136 were members of the armed forces. The total of 3,329,438 is 84 percent of the BEA's total number of jobs, suggesting that many workers (1) are employed by more than one business and/or (2) hold a wage and salary job as well as report self-employment income. Other data from the ACS indicates that 22 percent of employed Arizonans worked less than 35 hours per week.

Educational Attainment

Most commonly, educational attainment is expressed for those at least 25 years old. Though the age of 25 is arbitrary, a high proportion of individuals have completed their educations by that age. In 2019, Arizona's educational attainment in this large cohort was inferior to the nation. The share without either a high school diploma or a GED (general education development) certificate was higher in Arizona: 12.4 percent versus 11.4 percent nationally. Relative to the nation, lesser shares of Arizonans had earned a graduate degree (11.3-versus-12.8 percent nationally) and a bachelor's degree (18.8-versus-20.3 percent).

An examination of educational attainment by age group reveals that Arizona was particularly far below the nation among those younger than 35 in 2019. Arizona also was below average among those 35-to-64 years old. In contrast, the educational attainment of those 65 and older was higher in Arizona than nationally. Since few of those age 65 and older are working, the standard statistics on the entire 25-and-older population understate Arizona's educational disadvantage as it applies to the workforce.

Data on educational attainment by labor force status indicate that among those in the workforce, the educational attainment in Arizona of those 25-to-64 years old was below the national figure in 2019. The proportion of those working in a civilian job who had earned at least a bachelor's degree was 33.8 percent in Arizona and 38.9 percent nationally.

Arizona State University Graduates Employed in Arizona

Detailed figures from the dataset of 1990-through-2020 graduates of Arizona State University who were employed in Arizona during 2020 are provided in the appendix. Data are shown by undergraduate versus graduate degree and by residency status while a student.

ABOR's data for graduates in the most recent academic year need to be interpreted carefully. A significant proportion of those graduating in academic year 2020 graduated in May 2020. The

[5] According to the Census Bureau, the COVID-19 pandemic disrupted ACS data collection in 2020. The 2020 data are described as "experimental." Hence, 2019 ACS data are used in this report.

employment and wage information for these individuals in calendar year 2020 may reflect part-time employment prior to graduation and/or full-time employment after graduation. In the latter case, the wage data are for less than a year of full-time employment. For those graduating in academic year 2020, the average wage and median wage is very low and the percentage employed in all four quarters is very low compared to those graduating in prior years.

The following are among the basic conclusions that can be reached using the dataset of ASU graduates from academic years 1990 through 2020:

- The number of individuals earning a degree has increased significantly over time, by 319 percent overall between 1990 and 2020.
- The increase in the number of individuals earning a degree has been higher for graduate students than undergrads, and much higher for those who were classified as nonresidents while attending school than among those classified as residents.
- In 2020, the shares of the total number of graduates were 40.1 percent for resident undergraduates, 28.1 percent for nonresident undergraduates, 10.6 percent for resident graduate students, and 21.2 percent for nonresident graduate students.
- The percentage of graduates employed in Arizona is much higher for residents than nonresidents.
- The share of graduates employed in Arizona decreases significantly with the number of years since graduation, regardless of residency status while students.
- The percentage employed in all four quarters was less than 80 percent among recent graduates but generally was greater than 80 percent among older graduates.
- The average wage and the median wage increase significantly with the number of years elapsed since graduation, though this effect weakens with the number of years elapsed.
- The median wage and the average wage are somewhat higher for those who were classified as nonresidents.
- The average wage exceeds the median wage (for graduates employed in all four quarters, as well as for graduates employed at some point during the year) presumably because of a small number of graduates earning very high wages that boosts the average but not the median. The difference between average and median wages is larger for older graduates.

The number of individuals who graduated from ASU between academic years 1990 and 2020 who worked at jobs in Arizona that were covered by the unemployment insurance program in calendar year 2020 was 180,707. ASU graduates between 1990 and 2020 accounted for 6.4 percent of the QCEW total number employed, but this share is understated since it compares *individuals* with ASU degrees to the *number of jobs*.

The aggregate wages of individuals who graduated from ASU between academic years 1990 and 2020 ($13.5 billion) accounted for 8.2 percent of the QCEW total. ABOR estimates that “state tax revenue” (really, state and local government tax revenue in Arizona) in 2020 by those who graduated from ASU between 1990 and 2020 — based only on wages earned as part of the unemployment insurance program — was $956 million: 7.07 percent of aggregate wages.

A summary of the ASU graduates from 1990 through 2020 is provided in the top portion of Table 1. The bottom portion of Table 1 focuses on academic year 2019 graduates.[6] Table 1 needs to be interpreted carefully. Student characteristics vary by residency status and by undergraduate and graduate programs. For example, the magnitude of the difference in the average wage between undergraduate and graduate degrees in 2019 reflects not only the wage premium of the graduate degree but also the greater number of years of work experience prior to graduation among those with a graduate degree. The differential in the average wage of those with undergraduate and graduate degrees declines with the number of years of work experience. Among graduates from academic year 2019, the average wage in 2020 of those with a graduate degree was 54 percent higher than those with a bachelor's degree, but the differential for graduates over the entire 1990-to-2020 period was 32 percent. According to the 2019 ACS, all Arizona workers with a graduate degree (including those graduating before 1990) earned 28 percent more than those who had earned a bachelor's degree.

Alternative Estimates of Taxes Paid

ABOR estimates state and local government tax payments based on the following income levels and tax rates:

- Less than $25,001: 12.6 percent
- $25,001 to $75,000: 6.8 percent
- $75,001 to $100,000: 7.2 percent
- More than $100,000: 6.9 percent

The average tax rate of ASU graduates between 1990 and 2020 who worked in Arizona in 2020 was 7.07 percent.

ABOR's tax rates come from the 2007 edition of an annual study of tax burdens produced by the government of the District of Columbia.[7] The latest study is for 2019. Since the tax rates from this study fluctuate from year to year with changes in methodology, it is preferable to use the median rates over several years. The last major tax change in Arizona for individuals was fully implemented in 2008. Based on the 2009-through-2019 reports, the median combined state and local government tax rates in Arizona are higher than used by ABOR for those with incomes of $50,000 or more. The median rate at each of four incomes between $50,000 and $150,000 is between 8.4-and-8.8 percent. Since the District of Columbia study does not measure every state and local tax — though it includes income taxes, sales taxes, property taxes, and automobile-related taxes — the overall tax rate would be slightly higher.

A study by the Institute on Taxation and Economic Policy (ITEP), which includes all taxes, reports a similar state and local government tax burden in Arizona.[8] The figure is 8.5 percent for those earning between $55,000 and $96,400; the average wage of ASU graduates employed in Arizona reported by the ABOR is within this range. Using the 8.5 percent tax rate and the aggregate wage figures from the ABOR dataset, Arizona state and local government taxes paid

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[6] Graduates from 2019 instead of 2020 are used since the statistics for those graduating in May 2020 are affected by part-time wages earned while a student and less than full-year wages after graduation.

[7] "Tax Rates and Tax Burdens in the District of Columbia — A Nationwide Comparison," Government of the District of Columbia, https://cfo.dc.gov/node/1534591

[8] Institute on Taxation & Economic Policy, *Who Pays? A Distributional Analysis of the Tax Systems in All 50 States*, October 2018, http://www.itep.org/whopays/.

TABLE 1
ARIZONA STATE UNIVERSITY GRADUATES

	Total	Total Under-grad Degrees	Resident Under-grad Degrees	Non-resident Undergrad Degrees	Total Graduate Degrees	Resident Graduate Degrees	Non-resident Graduate Degrees
Graduates From 1990 Through 2020:							
Number Graduating From Arizona State University	405,849	286,739	213,118	73,621	119,110	65,728	53,382
Employed in Arizona and Covered by the Unemployment Insurance Program in 2020:							
Number	180,707	136,978	124,549	12,429	43,729	35,870	7,859
Share of Graduates (Percent)	45	48	58	17	37	55	15
Aggregate Wages (Dollars, Millions)	13,516	9,502	8,654	847	4,014	3,327	687
Average Wage (Dollars)	74,793	69,365	69,486	68,154	91,795	92,758	87,401
Estimated State and Local Government Tax Payments (Dollars, Millions)	956	675	614	60	282	233	48
Graduates From 2019:							
Number Graduating From Arizona State University	25,739	17,698	10,244	7,454	8,041	2,952	5,089
Employed in Arizona and Covered by the Unemployment Insurance Program in 2020:							
Number	12,517	9,428	7,960	1,468	3,089	2,247	842
Share of Graduates (Percent)	49	53	78	20	38	76	17
Aggregate Wages (Dollars, Millions)	576	383	326	57	193	143	50
Average Wage (Dollars)	45,982	40,607	40,945	38,778	62,385	63,671	58,953
Estimated State and Local Government Tax Payments (Dollars, Millions)	42	28	24	4	14	10	4

Source: Arizona Board of Regents from Arizona State University, Office of the University Provost.

on QCEW wages by those who graduated from ASU between 1990 and 2020 was approximately $1.15 billion in 2020, compared to ABOR's estimate of $956 million.

In order to estimate the amount of taxes paid just to state government, U.S. Census Bureau data were used. In fiscal year 2019, state tax collections accounted for 60.9 percent of combined state and local government tax collections in Arizona.[9] Applying this percentage to the estimates of state and local government taxes paid on QCEW wages by those who graduated from ASU between 1990 and 2020, the result is $803 million based on ABOR's estimate of state and local government taxes and $964 million based on the 8.5 percent state and local government tax rate.

Extending the Analysis to Include Those Who Graduated From ASU Before 1990

In order to provide an estimate of the number of individuals who graduated from ASU before 1990 and who were working in Arizona in 2020, actual data on the number of degrees awarded by ASU before 1990 were collected, with the earliest data from 1971. The official graduation data from ASU count number of degrees — individuals with more than one ASU degree are counted more than once. These data are not consistent with the figures used in the Arizona Board of Regents dataset, which counts individuals, not number of degrees. Thus, in order to estimate the number of individuals who had earned a degree from ASU before 1990, the historical graduation data for the years before 1990 were adjusted, using the ratio from the 1990-through-1999 period of the number of graduates counted in the Board of Regents database to the official count of degrees granted. The ratio was 88.7 percent for those with an undergraduate degree, 91.3 percent for those with a graduate degree, and 89.4 percent for all graduates.

In order to estimate the number of ASU graduates from before 1990 who were working in Arizona in 2020 and counted in the unemployment insurance program, a "backward projection" was made of the percentage of ASU graduates who were employed in Arizona in 2020. The percentage drops with the number of years since graduation; the rate of decline is rapid among recent grads but is lower and relatively stable among earlier graduates. The average annual decrease of 1.32 percentage points between 1990 and 1999 was used for the pre-1990 period. Using the adjusted graduation figures and the estimated percentage of graduates employed in Arizona, the number of employed ASU graduates was calculated by year for the pre-1990 period.

The average wage for graduates in the pre-1990 period was backward projected in the same manner as the percentage employed. The average wage rises significantly by the number of years since graduation for relatively recent graduates. Among earlier graduates, the increase in the average wage by year is lower and more stable. The annual average increase from the 1990-through-1999 period was 0.06 percent; this figure was applied to the pre-1990 period.

Using these backward projections, the number of individuals who graduated from ASU through academic year 2020 who worked at jobs in Arizona that were covered by the unemployment insurance program in 2020 is estimated to be 196,840 — 8.9 percent higher than the number of those who graduated from 1990 through 2020. Due to the high average wage of individuals who graduated prior to 1990, the differential in the aggregate wage of the entire set of ASU graduates relative to the 1990-to-2020 group was greater at 12.7 percent.

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[9] U.S. Department of Commerce, Census Bureau, State and Local Government Finance, https://www.census.gov/programs-surveys/gov-finances.html

This methodology does not directly address the increasing share of retirees among older ASU graduates. While the percentage of ASU graduates working in Arizona declines with the number of years since graduation over the 1990-to-2020 period, this decrease presumably occurs mostly due to out-migration. Few ASU graduates since 1990 — most of whom were less than 55 years old in 2020 — are likely to have retired. In contrast, retirement becomes increasingly likely among those who graduated during the 1970s. Thus, the estimates of the numbers employed in Arizona of graduates from this time period may be overstated. However, the results of the methodology that was used results in only 2.8 percent of 1971 graduates employed in Arizona in 2020. Any overstatement of graduates from the 1970s working in Arizona is partially offset by the exclusion of graduates from before 1971, a few of whom likely were still part of the workforce in 2020. Further, it seems unlikely that the rate of out-migration from Arizona for job-related reasons would be as high among those approaching retirement age as among those who are younger. Thus, the estimated number of older ASU graduates working in Arizona is believed to be reasonable.

Those who have graduated from ASU accounted for 7.0 percent of the QCEW number of jobs in Arizona in 2020, but again this share is understated since it compares *individuals* with ASU degrees to the *number of jobs*. The aggregate wage of individuals who have graduated from ASU accounted for 9.2 percent of the QCEW total. The 2020 average wage of $77,394 of those who have graduated from ASU was 32.5 percent higher than the average of the rest of the QCEW file (a group that includes those without a bachelor's degree and those who earned a degree from another institution). Based on the 7.07 percent tax rate and estimated QCEW wages, ASU graduates paid $1.08 billion in state and local government taxes in 2020, of which $656 million was paid to state government. Using the 8.5 percent tax rate, state and local government taxes paid amounted to $1.29 billion, of which $788 million was paid to state government.

Estimates from the ACS for 2019 indicate that 891,093 Arizona residents between the ages of 25 and 64 who had received at least a bachelor's degree were employed in civilian jobs. Based on various data from the ACS, the estimated total number of people working in civilian jobs in Arizona in 2019 who have earned a bachelor's or higher degree is 1,010,818. The estimated number of ASU graduates employed in the state and covered by the unemployment insurance program accounts for 19.5 percent of the estimated number of civilian workers with at least a bachelor's degree.

Extending the Analysis to Include ASU Graduates Employed in Arizona but Not Covered by the Unemployment Insurance Program

In order to estimate the number of ASU graduates working in Arizona in wage and salary jobs not covered by unemployment insurance or as proprietors (self-employed), the ASU shares of the QCEW total (6.97 percent of employment and 9.23 percent of wages) were applied to the BEA's total employment figure. The result is a total of 266,716 ASU graduates working in Arizona in 2020 (see Table 2). This figure is understated because the 6.97 percent figure is based on individuals with ASU degrees and the number of QCEW jobs.

The estimate of 266,716 ASU graduates working in Arizona accounts for 26.4 percent of the estimated number of employed Arizonans with at least a bachelor's degree in 2020. Thus, more

TABLE 2
ARIZONA STATE UNIVERSITY GRADUATES EMPLOYED IN ARIZONA IN 2020 COMPARED TO TOTAL EMPLOYMENT IN ARIZONA

	Employment	Aggregate Earnings*	Average Earnings
Employment in Arizona:			
QCEW Wage and Salary	2,823,760	$164,982	$58,426
Other Wage and Salary From BEA	143,725	11,196	77,901
Total Wage and Salary From BEA	2,967,485	176,179	59,370
Proprietors From BEA	858,677	25,639	29,859
Total From BEA	3,826,162	201,818	52,747
ASU Graduates Employed in Arizona:			
QCEW Wage and Salary, 1990 Through 2020	180,707	13,516	74,793
Estimate From Before 1990	16,133	1,719	106,526
Total QCEW Wage and Salary	196,840	15,234	77,394
Other Wage and Salary Plus Proprietors	69,876	3,401	48,677
Total	266,716	18,636	69,870
ASU Share of Total Employment in Arizona	6.97%	9.23%	132.5%

* In millions. Consists of wages and salaries and proprietors' Income.

Sources: U.S. Department of Labor, Bureau of Labor Statistics (QCEW: Quarterly Census of Employment and Wages); U.S. Department of Commerce, Bureau of Economic Analysis (BEA); and Arizona Board of Regents from Arizona State University, Office of the University Provost.

than one-in-four working individuals in Arizona who had earned at least a bachelor's degree had graduated from ASU. The aggregate earnings of the ASU graduates were around $18.6 billion. Based on the 7.07 percent tax rate and $18.6 billion in earnings, ASU graduates paid $1.32 billion in state and local government taxes in 2020, of which $803 million was paid to state government. Using the 8.5 percent tax rate, state and local government taxes paid amounted to $1.58 billion, of which $964 million was paid to state government.

The Impacts of ASU Graduates on the Workforce

The estimates of 266,716 ASU graduates working in Arizona, earning $18.6 billion, and paying between $1.32 and $1.58 billion in state and local government taxes do not provide a complete accounting of the impacts of ASU graduates on the Arizona economy. College graduates in the workforce boost the productivity of all workers, which results in an increase in wages for all workers. This is discussed in the May 2019 University Economist Paper, "The Economic Impact of Raising the Educational Attainment of Arizona's Workforce: 2019 Update," https://economist.asu.edu/p3/education.

ARIZONA STATE UNIVERSITY GRADUATES EMPLOYED IN ARIZONA, 2012 THROUGH 2020

The estimated number of ASU graduates (including those graduating prior to 1990) working in Arizona and covered by unemployment insurance accounted for 6.17 percent of all workers in the unemployment insurance program in 2012. Except for a dip in 2015, this share has increased, reaching 6.97 percent in 2020 (see Table 3). Similarly, other than a decline in 2015, the share of aggregate wages earned by ASU graduates increased from 8.28 percent in 2012 to 9.23 percent in 2020.

The average wage of ASU graduates climbed from 134.3 percent of the overall average in 2012 to 137.6 percent in 2015. While the 2016 figure slipped to 137.2 percent, the 2017 figure increased back to 137.6 and the 2018 figure rose to 138.2. The 2019 figure dipped slightly to 137.9 percent, and the 2020 figure fell more to 132.5 percent.

The estimated share of Arizona workers holding at least a bachelor's degree who are a graduate of ASU climbed from 25.6 percent in 2012 to 26.9 percent in 2014, held steady in 2015, then fell to 25.9 percent in 2016, and dropped further to 25.6 percent in 2017 and 2018. It increased slightly to 25.7 percent in 2019 and then increased to 26.4 percent in 2020. While the one-year percentage increase in ASU graduates working in Arizona did not vary much across these years, the annual percentage increase in the total number of employed university graduates in Arizona, derived from the ACS, was much bigger in 2016 through 2019 than in the three previous years.

TABLE 3
SUMMARY OF ARIZONA STATE UNIVERSITY GRADUATES EMPLOYED IN ARIZONA, 2012 THROUGH 2020

	Employment		Aggregate Earnings		Average Earnings		Tax Payments Estimated Range for State and Local Governments in Millions of 2020 Dollars		Share of Workforce With a University Degree
	Number	Share of Total	Millions of 2020 Dollars	Share of Total	2020 Dollars	Share of Total			
2012	203,372	6.17%	$12,420	8.28%	$61,072	134.3%	$893	$1,018	25.6%
2013	211,576	6.27	13,165	8.55	62,221	136.4	944	1,079	26.4
2014	219,106	6.35	13,711	8.71	62,578	137.2	981	1,124	26.9
2015	223,985	6.31	14,251	8.68	63,626	137.6	1,018	1,169	26.9
2016	231,010	6.34	14,788	8.70	64,014	137.2	1,056	1,213	25.9
2017	238,834	6.41	15,768	8.82	66,020	137.6	1,123	1,340	25.6
2018	249,691	6.47	16,403	8.94	65,694	138.2	1,164	1,394	25.6
2019	259,883	6.55	17,393	9.03	66,925	137.9	1,232	1,478	25.7
2020	266,716	6.97	18,636	9.23	69,870	132.5	1,318	1,584	26.4

Note: The upper range of the tax payment is based on an 8.2 percent tax rate from 2012 through 2016 and an 8.5 percent rate in 2017 through 2020.

Source: Calculated by authors.

APPENDIX
ARIZONA STATE UNIVERSITY GRADUATES FROM 1990 THROUGH 2020 EMPLOYED IN ARIZONA IN 2020: DETAIL BY CATEGORY OF DEGREE

Source: Arizona Board of Regents, from Arizona State University, Office of the University Provost.

ALL DEGREES

		2020						
Academic Year of Graduation	Number Earning a Degree	Number Employed in Arizona	Percent Employed in Arizona	Aggregate Wages in Millions	Average Wage	Estimated State and Local Government Tax Payments in Millions	Number Employed in Arizona During All Four Quarters	Percent Employed in All Four Quarters
1990	6,755	1,879	27.8%	$199.2	$106,037	$14.0	1,535	81.7%
1991	7,128	2,225	31.2	238.7	107,276	16.7	1,842	82.8
1992	7,096	2,292	32.3	225.7	98,451	15.9	1,901	82.9
1993	7,650	2,493	32.6	250.4	100,446	17.6	2,058	82.6
1994	7,750	2,653	34.2	276.3	104,130	19.4	2,223	83.8
1995	8,092	2,971	36.7	305.8	102,925	21.4	2,437	82.0
1996	8,044	3,053	38.0	310.5	101,689	21.8	2,589	84.8
1997	8,552	3,317	38.8	342.7	103,331	24.0	2,766	83.4
1998	9,113	3,591	39.4	361.3	100,603	25.3	3,033	84.5
1999	9,216	3,564	38.7	355.6	99,782	24.9	3,008	84.4
2000	9,631	3,947	41.0	415.8	105,340	29.1	3,357	85.1
2001	9,363	3,823	40.8	389.6	101,910	27.3	3,250	85.0
2002	9,878	4,256	43.1	423.2	99,431	29.6	3,580	84.1
2003	10,456	4,531	43.3	450.1	99,346	31.5	3,868	85.4
2004	11,055	4,876	44.1	461.6	94,664	32.4	4,164	85.4
2005	11,299	5,050	44.7	467.9	92,653	32.8	4,262	84.4
2006	11,630	5,270	45.3	494.6	93,858	34.6	4,549	86.3
2007	12,009	5,521	46.0	492.0	89,120	34.5	4,681	84.8
2008	12,681	5,789	45.7	513.8	88,758	36.0	4,891	84.5
2009	13,676	6,034	44.1	510.8	84,652	35.8	5,112	84.7
2010	14,391	6,855	47.6	548.2	79,968	38.5	5,794	84.5
2011	14,813	7,159	48.3	553.7	77,340	38.9	5,932	82.9
2012	15,481	7,558	48.8	549.4	72,693	38.6	6,348	84.0
2013	16,270	7,922	48.7	552.6	69,755	38.9	6,631	83.7
2014	17,135	8,344	48.7	564.0	67,590	39.8	6,983	83.7
2015	18,422	8,852	48.1	554.0	62,588	39.2	7,304	82.5
2016	19,468	9,076	46.6	545.6	60,120	38.7	7,463	82.2
2017	20,989	9,811	46.7	541.5	55,195	38.6	7,929	80.8
2018	23,734	10,897	45.9	564.6	51,816	40.5	8,698	79.8
2019	25,739	12,517	48.6	575.6	45,982	41.9	9,659	77.2
2020	28,333	14,581	51.5	480.8	32,974	37.7	8,596	59.0
TOTAL	405,849	180,707	44.5	13,515.6	74,793	956.1	146,443	81.0

ALL UNDERGRADUATE DEGREES

2020

Academic Year of Graduation	Number Earning a Degree	Number Employed in Arizona	Percent Employed in Arizona	Aggregate Wages in Millions	Average Wage	Estimated State and Local Government Tax Payments in Millions	Number Employed in Arizona During All Four Quarters	Percent Employed in All Four Quarters
1990	5,029	1,526	30.3%	$158.9	$104,144	$11.1	1,263	82.8%
1991	5,270	1,818	34.5	192.0	105,629	13.5	1,516	83.4
1992	5,338	1,863	34.9	180.6	96,941	12.7	1,573	84.4
1993	5,642	1,978	35.1	194.4	98,298	13.7	1,646	83.2
1994	5,612	2,114	37.7	214.3	101,373	15.0	1,782	84.3
1995	5,732	2,307	40.2	228.1	98,873	16.0	1,907	82.7
1996	5,780	2,341	40.5	222.9	95,219	15.7	1,998	85.3
1997	6,085	2,538	41.7	253.1	99,740	17.7	2,141	84.4
1998	6,574	2,770	42.1	262.3	94,678	18.4	2,356	85.1
1999	6,585	2,698	41.0	252.9	93,727	17.7	2,286	84.7
2000	7,005	3,055	43.6	300.2	98,270	21.0	2,620	85.8
2001	6,809	2,975	43.7	280.8	94,384	19.7	2,528	85.0
2002	7,097	3,239	45.6	301.5	93,089	21.1	2,723	84.1
2003	7,488	3,418	45.6	315.0	92,158	22.1	2,913	85.2
2004	7,926	3,714	46.9	332.5	89,514	23.3	3,189	85.9
2005	8,445	3,945	46.7	339.6	86,080	23.8	3,322	84.2
2006	8,651	4,119	47.6	362.1	87,910	25.4	3,546	86.1
2007	8,824	4,297	48.7	356.3	82,918	25.0	3,621	84.3
2008	9,229	4,370	47.4	350.2	80,147	24.6	3,681	84.2
2009	9,563	4,418	46.2	338.8	76,695	23.8	3,734	84.5
2010	10,135	5,042	49.7	375.7	74,524	26.5	4,246	84.2
2011	10,348	5,256	50.8	369.7	70,334	26.1	4,330	82.4
2012	10,997	5,692	51.8	377.2	66,274	26.6	4,721	82.9
2013	11,558	5,958	51.5	376.8	63,246	26.6	4,963	83.3
2014	12,047	6,316	52.4	390.0	61,752	27.7	5,246	83.1
2015	12,546	6,633	52.9	379.2	57,172	27.0	5,445	82.1
2016	13,010	6,749	51.9	367.0	54,378	26.2	5,498	81.5
2017	14,302	7,274	50.9	363.6	49,993	26.1	5,800	79.7
2018	16,088	8,124	50.5	373.9	46,018	27.1	6,393	78.7
2019	17,698	9,428	53.3	382.8	40,607	28.3	7,147	75.8
2020	19,326	11,003	56.9	308.8	28,067	25.1	6,451	58.6
TOTAL	286,739	136,978	47.8	9,501.5	69,365	674.6	110,585	80.7

RESIDENT UNDERGRADUATE DEGREES

2020

Academic Year of Graduation	Number Earning a Degree	Number Employed in Arizona	Percent Employed in Arizona	Aggregate Wages in Millions	Average Wage	Estimated State and Local Government Tax Payments in Millions	Number Employed in Arizona During All Four Quarters	Percent Employed in All Four Quarters
1990	4,115	1,427	34.7%	$149.7	$104,879	$10.5	1,187	83.2%
1991	4,276	1,701	39.8	177.9	104,615	12.5	1,418	83.4
1992	4,338	1,759	40.5	167.9	95,461	11.8	1,486	84.5
1993	4,493	1,831	40.8	178.6	97,516	12.5	1,527	83.4
1994	4,528	1,967	43.4	194.7	98,982	13.7	1,650	83.9
1995	4,730	2,175	46.0	212.0	97,466	14.9	1,802	82.9
1996	4,838	2,216	45.8	210.5	94,977	14.8	1,894	85.5
1997	4,957	2,358	47.6	229.3	97,225	16.1	1,994	84.6
1998	5,131	2,564	50.0	240.2	93,699	16.9	2,185	85.2
1999	5,116	2,471	48.3	227.7	92,159	16.0	2,095	84.8
2000	5,389	2,781	51.6	270.3	97,182	18.9	2,384	85.7
2001	5,270	2,730	51.8	251.6	92,170	17.7	2,310	84.6
2002	5,663	2,998	52.9	275.2	91,804	19.3	2,522	84.1
2003	5,977	3,149	52.7	286.8	91,077	20.1	2,677	85.0
2004	6,363	3,454	54.3	304.5	88,153	21.4	2,964	85.8
2005	6,726	3,666	54.5	311.7	85,029	21.9	3,092	84.3
2006	6,965	3,851	55.3	335.2	87,032	23.5	3,321	86.2
2007	7,089	3,995	56.4	324.2	81,148	22.8	3,372	84.4
2008	7,341	4,094	55.8	327.6	80,019	23.0	3,454	84.4
2009	7,519	4,114	54.7	312.3	75,916	22.0	3,491	84.9
2010	8,094	4,716	58.3	351.1	74,445	24.7	3,993	84.7
2011	8,262	4,907	59.4	341.7	69,626	24.1	4,043	82.4
2012	8,780	5,320	60.6	348.9	65,575	24.6	4,405	82.8
2013	9,120	5,534	60.7	350.5	63,333	24.8	4,636	83.8
2014	9,106	5,836	64.1	357.9	61,327	25.4	4,858	83.2
2015	9,233	6,022	65.2	341.6	56,724	24.3	4,952	82.2
2016	9,269	6,192	66.8	335.7	54,208	24.0	5,067	81.8
2017	9,203	6,495	70.6	322.5	49,646	23.2	5,215	80.3
2018	9,611	7,043	73.3	325.2	46,167	23.5	5,593	79.4
2019	10,244	7,960	77.7	325.9	40,945	24.0	6,129	77.0
2020	11,372	9,223	81.1	265.8	28,822	21.5	5,646	61.2
TOTAL	213,118	124,549	58.4	8,654.4	69,486	614.1	101,362	81.4

NONRESIDENT UNDERGRADUATE DEGREES

2020

Academic Year of Graduation	Number Earning a Degree	Number Employed in Arizona	Percent Employed in Arizona	Aggregate Wages in Millions	Average Wage	Estimated State and Local Government Tax Payments in Millions	Number Employed in Arizona During All Four Quarters	Percent Employed in All Four Quarters
1990	914	99	10.8%	$9.3	$93,550	$0.7	76	76.8%
1991	994	117	11.8	14.1	120,369	1.0	98	83.8
1992	1,000	104	10.4	12.7	121,980	0.9	87	83.7
1993	1,149	147	12.8	15.9	108,037	1.1	119	81.0
1994	1,084	147	13.6	19.6	133,365	1.4	132	89.8
1995	1,002	132	13.2	16.1	122,068	1.1	105	79.5
1996	942	125	13.3	12.4	99,516	0.9	104	83.2
1997	1,128	180	16.0	23.9	132,688	1.7	147	81.7
1998	1,443	206	14.3	22.0	106,860	1.5	171	83.0
1999	1,469	227	15.5	25.2	110,796	1.8	191	84.1
2000	1,616	274	17.0	30.0	109,312	2.1	236	86.1
2001	1,539	245	15.9	29.2	119,053	2.0	218	89.0
2002	1,434	241	16.8	26.3	109,071	1.8	201	83.4
2003	1,511	269	17.8	28.2	104,805	2.0	236	87.7
2004	1,563	260	16.6	28.0	107,603	2.0	225	86.5
2005	1,719	279	16.2	27.9	99,883	2.0	230	82.4
2006	1,686	268	15.9	26.9	100,525	1.9	225	84.0
2007	1,735	302	17.4	32.1	106,333	2.3	249	82.5
2008	1,888	276	14.6	22.6	82,039	1.6	227	82.2
2009	2,044	304	14.9	26.5	87,233	1.9	243	79.9
2010	2,041	326	16.0	24.7	75,657	1.7	253	77.6
2011	2,086	349	16.7	28.0	80,297	2.0	287	82.2
2012	2,217	372	16.8	28.4	76,270	2.0	316	84.9
2013	2,438	424	17.4	26.3	62,105	1.9	327	77.1
2014	2,941	480	16.3	32.1	66,919	2.3	388	80.8
2015	3,313	611	18.4	37.6	61,592	2.7	493	80.7
2016	3,741	557	14.9	31.3	56,269	2.2	431	77.4
2017	5,099	779	15.3	41.2	52,885	3.0	585	75.1
2018	6,477	1,081	16.7	48.7	45,051	3.5	800	74.0
2019	7,454	1,468	19.7	56.9	38,778	4.2	1,018	69.3
2020	7,954	1,780	22.4	43.0	24,157	3.6	805	45.2
TOTAL	73,621	12,429	16.9	847.1	68,154	60.4	9,223	74.2

ALL GRADUATE DEGREES

2020

Academic Year of Graduation	Number Earning a Degree	Number Employed in Arizona	Percent Employed in Arizona	Aggregate Wages in Millions	Average Wage	Estimated State and Local Government Tax Payments in Millions	Number Employed in Arizona During All Four Quarters	Percent Employed in All Four Quarters
1990	1,726	353	20.5%	$40.3	$114,221	$2.8	272	77.1%
1991	1,858	407	21.9	46.7	114,634	3.3	326	80.1
1992	1,758	429	24.4	45.0	105,009	3.2	328	76.5
1993	2,008	515	25.6	56.0	108,697	3.9	412	80.0
1994	2,138	539	25.2	62.0	114,942	4.3	441	81.8
1995	2,360	664	28.1	77.7	117,001	5.4	530	79.8
1996	2,264	712	31.4	87.5	122,962	6.1	591	83.0
1997	2,467	779	31.6	89.6	115,030	6.3	625	80.2
1998	2,539	821	32.3	99.0	120,594	6.9	677	82.5
1999	2,631	866	32.9	102.7	118,646	7.2	722	83.4
2000	2,626	892	34.0	115.6	129,553	8.1	737	82.6
2001	2,554	848	33.2	108.8	128,314	7.6	722	85.1
2002	2,781	1,017	36.6	121.7	119,630	8.5	857	84.3
2003	2,968	1,113	37.5	135.1	121,419	9.4	955	85.8
2004	3,129	1,162	37.1	129.1	111,124	9.0	975	83.9
2005	2,854	1,105	38.7	128.3	116,122	8.9	940	85.1
2006	2,979	1,151	38.6	132.5	115,141	9.2	1,003	87.1
2007	3,185	1,224	38.4	135.7	110,895	9.5	1,060	86.6
2008	3,452	1,419	41.1	163.6	115,276	11.4	1,210	85.3
2009	4,113	1,616	39.3	172.0	106,406	12.0	1,378	85.3
2010	4,256	1,813	42.6	172.4	95,107	12.0	1,548	85.4
2011	4,465	1,903	42.6	184.0	96,691	12.9	1,602	84.2
2012	4,484	1,866	41.6	172.2	92,275	12.0	1,627	87.2
2013	4,712	1,964	41.7	175.8	89,502	12.3	1,668	84.9
2014	5,088	2,028	39.9	173.9	85,773	12.2	1,737	85.7
2015	5,876	2,219	37.8	174.8	78,778	12.3	1,859	83.8
2016	6,458	2,327	36.0	178.6	76,772	12.5	1,965	84.4
2017	6,687	2,537	37.9	177.9	70,110	12.5	2,129	83.9
2018	7,646	2,773	36.3	190.8	68,799	13.4	2,305	83.1
2019	8,041	3,089	38.4	192.7	62,385	13.6	2,512	81.3
2020	9,007	3,578	39.7	172.0	48,065	12.6	2,145	59.9
TOTAL	119,110	43,729	36.7	4,014.1	91,795	281.5	35,858	82.0

RESIDENT GRADUATE DEGREES

2020

Academic Year of Graduation	Number Earning a Degree	Number Employed in Arizona	Percent Employed in Arizona	Aggregate Wages in Millions	Average Wage	Estimated State and Local Government Tax Payments in Millions	Number Employed in Arizona During All Four Quarters	Percent Employed in All Four Quarters
1990	1,112	289	26.0%	$32.4	$112,088	$2.3	226	78.2%
1991	1,332	355	26.7	42.4	119,388	3.0	285	80.3
1992	1,247	391	31.4	41.9	107,203	2.9	299	76.5
1993	1,417	476	33.6	51.2	107,642	3.6	380	79.8
1994	1,546	501	32.4	57.4	114,590	4.0	414	82.6
1995	1,713	614	35.8	70.7	115,073	4.9	485	79.0
1996	1,624	648	39.9	77.3	119,271	5.4	535	82.6
1997	1,714	675	39.4	76.0	112,582	5.3	537	79.6
1998	1,773	719	40.6	82.7	114,987	5.8	595	82.8
1999	1,839	781	42.5	91.8	117,579	6.4	652	83.5
2000	1,773	774	43.7	101.2	130,803	7.1	633	81.8
2001	1,698	735	43.3	95.4	129,736	6.7	624	84.9
2002	1,971	914	46.4	109.0	119,260	7.6	771	84.4
2003	2,042	984	48.2	119.0	120,917	8.3	849	86.3
2004	2,009	996	49.6	109.6	110,045	7.7	830	83.3
2005	1,976	984	49.8	110.9	112,717	7.7	831	84.5
2006	1,891	997	52.7	113.6	113,953	7.9	869	87.2
2007	2,038	1,072	52.6	115.0	107,251	8.0	928	86.6
2008	2,316	1,265	54.6	144.0	113,869	10.0	1,082	85.5
2009	2,436	1,375	56.4	144.0	104,701	10.0	1,173	85.3
2010	2,673	1,563	58.5	144.1	92,199	10.1	1,328	85.0
2011	2,737	1,617	59.1	153.6	94,973	10.7	1,368	84.6
2012	2,608	1,553	59.5	137.0	88,207	9.6	1,360	87.6
2013	2,658	1,636	61.6	140.4	85,815	9.8	1,395	85.3
2014	2,627	1,663	63.3	140.2	84,322	9.8	1,432	86.1
2015	2,674	1,757	65.7	135.1	76,867	9.5	1,480	84.2
2016	2,726	1,824	66.9	138.8	76,118	9.7	1,554	85.2
2017	2,733	1,974	72.2	138.5	70,173	9.7	1,691	85.7
2018	2,882	2,080	72.2	142.9	68,683	10.0	1,770	85.1
2019	2,952	2,247	76.1	143.1	63,671	10.1	1,903	84.7
2020	2,991	2,411	80.6	128.1	53,138	9.3	1,690	70.1
TOTAL	65,728	35,870	54.6	3,327.2	92,758	233.1	29,969	83.5

NONRESIDENT GRADUATE DEGREES

2020

Academic Year of Graduation	Number Earning a Degree	Number Employed in Arizona	Percent Employed in Arizona	Aggregate Wages in Millions	Average Wage	Estimated State and Local Government Tax Payments in Millions	Number Employed in Arizona During All Four Quarters	Percent Employed in All Four Quarters
1990	614	64	10.4%	$7.9	$123,856	$0.6	46	71.9%
1991	526	52	9.9	4.3	82,178	0.3	41	78.8
1992	511	38	7.4	3.1	82,435	0.2	29	76.3
1993	591	39	6.6	4.7	121,571	0.3	32	82.1
1994	592	38	6.4	4.5	119,581	0.3	27	71.1
1995	647	50	7.7	7.0	140,668	0.5	45	90.0
1996	640	64	10.0	10.3	160,330	0.7	56	87.5
1997	753	104	13.8	13.6	130,917	0.9	88	84.6
1998	766	102	13.3	16.3	160,119	1.1	82	80.4
1999	792	85	10.7	10.9	128,450	0.8	70	82.4
2000	853	118	13.8	14.3	121,355	1.0	104	88.1
2001	856	113	13.2	13.5	119,063	0.9	98	86.7
2002	810	103	12.7	12.7	122,912	0.9	86	83.5
2003	926	129	13.9	16.2	125,250	1.1	106	82.2
2004	1,120	166	14.8	19.5	117,598	1.4	145	87.3
2005	878	121	13.8	17.4	143,811	1.2	109	90.1
2006	1,088	154	14.2	18.9	122,830	1.3	134	87.0
2007	1,147	152	13.3	20.8	136,597	1.4	132	86.8
2008	1,136	154	13.6	19.5	126,832	1.4	128	83.1
2009	1,677	241	14.4	28.0	116,134	1.9	205	85.1
2010	1,583	250	15.8	28.3	113,291	2.0	220	88.0
2011	1,728	286	16.6	30.4	106,402	2.1	234	81.8
2012	1,876	313	16.7	35.2	112,460	2.5	267	85.3
2013	2,054	328	16.0	35.4	107,891	2.5	273	83.2
2014	2,461	365	14.8	33.7	92,383	2.4	305	83.6
2015	3,202	462	14.4	39.8	86,047	2.8	379	82.0
2016	3,732	503	13.5	39.8	79,143	2.8	411	81.7
2017	3,954	563	14.2	39.3	69,892	2.8	438	77.8
2018	4,764	693	14.5	47.9	69,148	3.4	535	77.2
2019	5,089	842	16.5	49.6	58,953	3.5	609	72.3
2020	6,016	1,167	19.4	43.9	37,585	3.3	455	39.0
TOTAL	53,382	7,859	14.7	686.9	87,401	48.4	5,889	74.9