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Arizona State University's Monthly Newsletter on the Arizona Economy

Economic performance solid in 2000

Quarterly Economic Forecast

The economy continues to expand in 2000, both locally and on the national level, with growth in output, employment and income. Unemployment remains low, while inflation outside of the energy sector is still moderate. In addition, recent revisions to 1999 data show stronger growth than previously reported.

NATIONAL

The performance of the national economy continues to be excellent. Consumer spending, business investment in new equipment and increased productivity are fueling the U.S. economy. Low unemployment, low inflation and high productivity are all key elements of the current cycle.

Real Gross Domestic Product (GDP) grew at a rate of 4.1 percent last year, following a 4.3 percent gain in 1998. Real GDP is expected to increase 4.0 percent in 2000 and 3.0 percent in 2001. National unemployment is hovering around 4 percent, near a three-decade low, while inflation remains benign, averaging slightly above 2 percent per year over the last several years.

The upward trend in interest rates that began in 1999 has slowed the housing and private construction sectors, although a rebounding world economy and rising exports are restoring health to the U.S. manufacturing sector. Housing starts are expected to slow in 2000, down 4.5 percent compared to 1999.

The U.S. economy is reaping the benefits brought about by a revolution in the use of computers and other high-tech devices to make workers more productive. In the last four years, productivity gains have shot up to nearly 3 percent annually. This is allowing wages to increase without causing a rise in the inflation rate.

Job gains will moderate in 2000 and 2001, primarily because of labor force shortages rather than falling demand. The unemployment rate is forecasted to fall again this year to 4.0, before rising to 4.2 percent in 2001.

On the international front, most areas of the globe are beginning to recover, bringing the promise of an extended period of worldwide stability. For example, the Asian economies experienced a healthy recovery last year, growing at a 6 percent clip after the 1998 currency crisis nearly crippled economic growth in this region. Growth is expected to increase slightly this year and will improve even further in 2001.

The spike in oil prices early this year is not expected to have any long-lasting impact on the general price level as investment in technology continues to make our economy less energy-dependent, and greater global competitiveness makes it increasingly difficult to pass on price increases. The price of oil, which serves as a raw material in a number of consumer goods, increased more as the result of OPEC's decision to cut production last year than due to any real imbalance between supply and demand.

ARIZONA

Revisions in the state's wage and salary employment figures for 1998 and 1999 were released, showing impressive increases across most sectors. The total number of new jobs added in 1999 reached 85,600, a 4.1 percent increase over the year. This followed growth of 90,100 jobs (a 4.5 percent increase) in 1998. Forecasts have been revised to reflect an increase of 3.8 percent for 2000 and 2.8 percent in 2001.

Arizona's economy is expected to have another great year. The state's unemployment rate averaged 4.2 percent last year and will remain low, at 4.3 percent in 2000 and 4.6 percent in 2001. Increasingly, employers are attracting workers by using incentives like hiring bonuses, flexible hours,

INSIDE

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family leave, educational training, stock options and other perks.

In 1999, the three sectors creating the largest number of new jobs in the state were services (53,400), trade (13,300) and construction (10,800). The services sector will continue to be the major provider of new jobs in 2000, with an expected increase of 40,700 new jobs compared to a year ago, a 6.0 percent gain.

The manufacturing sector is expected to rebound slightly in 2000. The Tucson metropolitan area has already begun to show signs of improvements, adding more than 4,000 new jobs in manufacturing during the first two months of the year compared to the same period last year. The only continued weakness expected this year will be in the mining sector, declining an additional 10 percent compared to the previous year.

The state's retail sales held strong in 1999 with an increase of 10.0 percent over 1998. Retail sales forecasts for 2000 and 2001 were revised upward to 7.0 percent and 5.5 percent respectively. Maricopa County also registered strong growth at 10.4 percent in 1999. Strong growth in retail sales is expected to continue, mirroring the state forecast.

Construction activity in Arizona continued at a brisk pace in 1999. The number of single family building permits issued remained high, with 51,764 new permits being issued during the year. A combination of several economic and demographic factors sustained

TABLE 1

2000 AND 2001 ECONOMIC FORECASTS: UNITED STATES

	Actual 1996	Actual 1997	Actual 1998	Actual 1999	Forecast 2000	Forecast 2001
Gross Domestic Product						
Billions of 1996 Dollars	7,813.1	8,144.9	8,495.7	8,848.2	9,202.2	9,478.2
Percent Change	3.6	4.2	4.3	4.1	4.0	3.0
Industrial Production (Percent Change)	4.4	6.3	4.3	3.5	3.8	3.0
Net Exports (Billions of 1992 Dollars)	–89.0	–112.2	–217.6	–323.0	–370.0	–360.0
Housing Starts						
Number in Thousands	1,476.8	1,474.0	1,616.9	1,663.0	1,588.2	1,499.2
Percent Change*	9.1	–0.2	9.7	2.9	–4.5	–5.6
Unemployment Rate (Percent)	5.4	4.9	4.5	4.2	4.0	4.2
Consumer Price Index (Percent Change)	2.9	2.3	1.6	2.2	2.7	2.6
Three-Month Treasury Bill Rate (Percent)	5.0	5.1	4.8	4.6	6.0	6.2
10-Year Treasury Note Rate (Percent)	6.4	6.4	5.3	5.6	6.2	6.4

* Calculated prior to rounding

TABLE 2

2000 AND 2001 ECONOMIC FORECASTS: ARIZONA

	Actual 1996	Actual 1997	Actual 1998	Actual 1999	Forecast 2000	Forecast 2001
Personal Income						
Millions of Current Dollars	93,391	100,160	108,086	115,435	122,592	129,212
Percent Change	8.0	7.2	7.9	6.8	6.2	5.4
Retail Sales						
Millions of Current Dollars	32,319	34,584	37,094	40,794	43,650	46,050
Percent Change	5.9	7.0	7.3	10.0	7.0	5.5
Unemployment Rate (Percent)	5.5	4.6	4.2	4.2	4.3	4.6
Wage and Salary Employment						
Number in Thousands	1,892.2	1,984.6	2,074.7	2,160.2	2,242.5	2,306.3
Percent Change	5.4	4.9	4.5	4.1	3.8	2.8
Population						
Number in Thousands	4,438	4,570	4,703	4,837	4,963	5,082
Percent Change	3.3	3.0	2.9	2.8	2.6	2.4
Single-family Units Permitted						
Number	40,386	42,993	50,997	51,764	46,329	39,379
Percent Change	4.9	6.5	18.6	1.5	–10.5	–15.0
Multi-family Units Permitted*						
Number	11,688	13,043	13,218	12,067	10,559	9,503
Percent Change	0.5	11.6	1.3	–8.7	–12.5	–10.0

*Apartment complexes of three or more units

Source (Tables 1 and 2): Bank One Economic Outlook Center, L. William Seidman Research Institute, College of Business, Arizona State University.

the high level of residential construction. The most important factor was low mortgage rates. Although rates have moved up from their 30-year low of 6.7 percent in fourth quarter 1998, they remained favorable throughout 1999. In 1999, mortgage rates ranged between 6.8 percent and 7.8 percent. Other factors that led to the increased number of permits issued in 1999 included strong consumer confidence, and a stock market boom that has helped fuel demand for second homes as well as moving up by existing homeowners. These factors have contributed to the prolonged strength of the current housing cycle.

The recent increase in mortgage rates is expected to slow the state's residential activity in 2000 and 2001. Permits are expected to decline to 46,329 units in 2000 and 39,379 units in 2001. Single-family construction bottomed out in 1990 at 18,507 units and activity has been above 30,000 units since 1993.

Maricopa County led the state throughout most of the current expansion so it is no surprise that much of the moderation in economic activity also is occurring there. Economic growth in Pima County is accelerating after taking a breather for a few years.

—Yolanda Strozier
Research Economist
—Tracy Clark
Senior Economist
Bank One Economic Outlook Center

TABLE 3

2000 AND 2001 ECONOMIC FORECASTS: MARICOPA COUNTY

	Actual 1996	Actual 1997	Actual 1998	Actual 1999	Forecast 2000	Forecast 2001
Retail Sales						
Millions of Current Dollars	21,664	23,360	25,207	27,825	29,829	31,499
Percent Change	8.2	7.8	7.9	10.4	7.2	5.6
Unemployment Rate (Percent)	3.6	3.0	2.7	2.8	3.0	3.3
Wage and Salary Employment						
Number in Thousands	1,272.5	1,344.2	1,418.9	1,487.1	1,545.1	1,591.4
Percent Change	7.0	5.6	5.6	4.8	3.9	3.0
Population						
Number in Thousands	2,621	2,706	2,794	2,882	2,966	3,046
Percent Change	3.7	3.2	3.3	3.1	2.9	2.7
Single-Family Units Permitted						
Number	28,319	30,466	35,603	35,430	30,680	25,732
Percent Change	2.1	7.6	16.9	–0.5	–13.4	–16.1
Multi-family Units Permitted*						
Number	9,723	10,787	10,529	9,524	8,229	7,324
Percent Change	21.1	10.9	–2.4	–9.5	–13.6	–11.0

*Apartment complexes of three or more units

TABLE 4

2000 AND 2001 EMPLOYMENT FORECASTS: ARIZONA
(In Thousands)

	Actual 1996	Percent Change	Actual 1997	Percent Change	Actual 1998	Percent Change	Actual 1999	Percent Change	Forecast 2000	Percent Change	Forecast 2001	Percent Change
Manufacturing	199.9	3.2	207.4	3.8	216.0	4.1	211.4	–2.1	216.6	2.5	221.0	2.0
Mining	14.0	8.5	13.8	–1.4	13.0	–5.8	11.5	–11.5	10.3	–10.0	10.2	–1.0
Construction	126.2	5.4	131.8	4.4	143.8	9.1	154.6	7.5	157.7	2.0	151.4	–4.0
TCPU*	91.8	5.3	96.6	5.2	100.9	4.5	103.7	2.8	106.8	3.0	109.5	2.5
Trade	464.4	4.5	482.4	3.9	498.0	3.2	511.3	2.7	529.2	3.5	542.5	2.5
FIRE**	117.1	8.6	127.7	9.1	135.6	6.2	139.7	3.0	144.3	3.3	150.1	4.0
Services	560.9	8.1	596.7	6.4	626.1	4.9	679.5	8.5	720.2	6.0	756.2	5.0
Government	317.9	2.4	328.2	3.2	341.5	4.1	348.7	2.1	357.4	2.5	365.6	2.3
Total Wage and Salary Employment	1,892.2	5.4	1,984.6	4.9	2,074.7	4.5	2,160.2	4.1	2,242.5	3.8	2,306.3	2.8
Total Employment	2,087.7	0.4	2,083.1	–0.2	2,178.3	4.6	2,301.5	5.7	2,402.8	4.4	2,494.1	3.8
Total Unemployment	121.7	9.3	101.5	–16.6	94.3	–7.1	100.9	7.0	107.7	6.8	119.3	10.8
Labor Force	2,209.5	0.9	2,184.6	–1.1	2,272.5	4.0	2,402.4	5.7	2,510.5	4.5	2,613.4	4.1
Unemployment Rate	5.5%		4.6%		4.2%		4.2%		4.3%		4.6%	

*Transportation, Communications and Public Utilities **Finance, Insurance and Real Estate

Source (Tables 3 and 4): Bank One Economic Outlook Center, L. William Seidman Research Institute, College of Business, Arizona State University.

Bank One Arizona Leading Index drops in January

The Bank One Arizona Index of Leading Economic Indicators fell again in January to 109.2. This is 0.2 percent below the 109.4 figure for December 1999 but 2.5 percent above January 1999's 106.5 (1987 = 100).

Production, new orders, delivery times, inventories and employment from the Purchasing Managers Index were negative. Hours worked in manufacturing, the inflation-adjusted value of the money supply M2, the inflation-adjusted value of Maricopa County residential building permits, and sensitive materials prices were positive.

ANALYSIS

All measures from the Purchasing Managers Index were negative in January, while the rest of the Leading Index measures were positive. The net contribution of the Purchasing Managers components has been positive in seven of the last 12 months, negative in the other five. Overall, the Index maintains a positive trend and the declines for the last two months are not large enough to cause concern.

The employment index from the Purchasing Managers Index dropped substantially in October. It did not return to its previous value until March (see page 11). Employment growth is expected to continue slowing in 2000 and 2001 but should remain positive.

In 1999, total employment growth in Arizona was fast enough to rank the state second in the nation behind Nevada. The growth rate so far in 2000 has been even stronger. Manufacturing and mining suffered absolute declines in 1999. The future for mining remains grim, however, manufacturing has begun to grow again. The remaining employment sectors performed well and are expected to do well in 2000. The unemployment rate is low enough that employment growth may be constrained by the small size of the remaining labor pool.

The other components of the Purchasing Managers Index — delivery times, new orders, production and inventories — had been on bumpy but generally positive upward trends prior to January. The low values in January were aberrations, as each posted higher figures in February and March.

The inflation-adjusted value of Maricopa County building permits has started a downward trend indicating that the rate of growth of residential construction has begun to slow. The 2000 consensus forecast is for a lower level of activity than that for 1999 — an event many forecasters have been predicting for quite some time. However, activity will only be modestly lower by historical standards.

Hours worked in manufacturing was on an upward path again in 1999 after dropping in the aftermath of the Asian crisis. Manufacturers appear to be using overtime more since the labor market is tight and hiring costs are high. The trend in hours worked suggests that manufacturing is back on track.

Higher sensitive materials prices tend to reinforce the improving picture for manufacturing, since they usually imply higher demand. Fortunately, the rate of increase is slowing suggesting that inflationary pressure is dropping.

Money supply growth finally is slowing, which may mean the brakes applied by the Federal Reserve Board are starting to take hold. However, the recent drop in the stock market may do more to slow the economy than the Fed's actions.

–Tracy L. Clark
Senior Economist
Bank One Economic Outlook Center

TABLE 1

NET CONTRIBUTION OF INDIVIDUAL COMPONENTS TO THE ARIZONA INDEX OF LEADING ECONOMIC INDICATORS

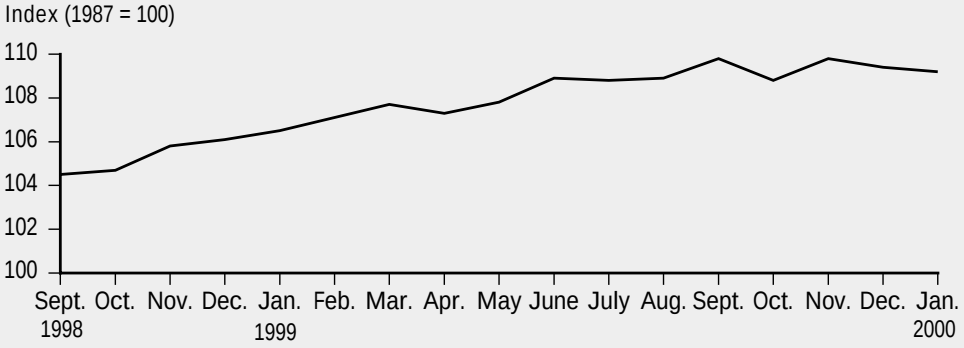
	Net Contribution+			
	Oct.	*Nov.*	*Dec.*	*Jan.*
Delivery Time*	0.07	0.17	–0.12	–0.10
Inventory Levels*	–0.09	0.02	–0.11	–0.05
New Orders*	–0.13	–0.02	0.01	–0.15
Production*	–0.14	0.30	–0.10	–0.27
Employment*	–0.51	0.24	0.00	–0.01
Residential Building Permits	–0.17	0.18	–0.27	0.06
Average Workweek, Manufacturing	0.03	–0.17	–0.11	0.14
Money Supply	0.09	0.16	0.23	0.13
Change in Sensitive Materials Prices	–0.12	0.06	–0.01	0.02

+ The net contribution of each component is calculated by multiplying the monthly percent change in its index by its relative importance.

*Based on indicators from the Purchasing Management Association of Arizona, Purchasing Management Association of Southern Arizona and the Northern Arizona Group.

FIGURE I

ARIZONA INDEX OF LEADING ECONOMIC INDICATORS



Source: (Table 1 and Figure I): Bank One Economic Outlook Center, L. William Seidman Research Institute, College of Business, Arizona State University.

Retail sales growth accelerated in 1999

Retail sales in Arizona rose 10 percent in 1999, up from a 7 percent advance in 1998. Adjusting for inflation, the real sales gain of 8.4 percent in 1999 was considerably higher than the 5.9 percent advance in 1998 (see Table 1).

Arizona's annual real growth rate in retail sales was greater than in 1999 in only two years since 1980 (1983 and 1994). In both years, gains were high because of a recovery in sales from a recent recession. The strong growth recorded in 1999 followed seven straight years of moderate-to-strong increases, making the 1999 advance more remarkable.

Retail growth rates in Arizona accelerated throughout 1999. Sales in November and December were 13 percent higher than in the year before. Sales were strongest in categories not typically associated with holiday shopping, such as motor vehicles. Sales at general merchandise and apparel and accessory stores were weak during the 1999 holiday season.

Retail sales in Arizona totaled $40.8 billion in 1999. Among the categories shown in Table 2, sales volumes were greatest for motor vehicles and restaurants and bars, though the not-categorized sales exceeded the sum of these two categories. The growth rate was higher in 1999 than in 1998 in most categories, but the doubling of the growth rate in motor vehicle sales accounted for much of the overall acceleration.

Between 1991, the end of the last recession, and 1999, retail sales climbed the most in the motor vehicles and other vehicles categories. Increases were only about half the overall figure in food stores, miscellaneous retail, apparel and accessory stores and general merchandise stores.

In Maricopa County, retail sales in 1999 reached $27.8 billion, a little more than two-thirds of the state's total. The real advance in Maricopa County (8.8 percent) continued to exceed that in Pima County (7.2 percent) and in the balance of the state (8.0 percent). Each area had a 1999 growth rate at least two percentage points higher than in 1998.

The real increase in retail sales in Arizona in 1999 exceeded the national figure for the seventh time in eight years. The cumulative inflation-adjusted gains over these eight years were 65 percent in Arizona and 39 percent nationally. However, Arizona's much more rapid population growth accounted for nearly all of the state's greater advance. Real per capita growth in Arizona between 1991 and 1999 was 30 percent, compared to the national average of 28 percent. The cumulative advance in Maricopa County was 37 percent, but it was only 17 percent in Pima County and 14 percent in the balance of the state.

Retail sales per capita were $8,440 in 1999 in Arizona, an inflation-adjusted increase of 5.4 percent. The average boost of the seven prior years was 3 percent. In Maricopa County, real per capita retail sales climbed 5.5 percent in 1999, the eighth consecutive gain and an increase slightly more than in the rest of the state. Pima County's real per capita sales went up 4.8 percent in 1999 and were 21 percent less than Maricopa County's $9,655. Real per capita sales in the balance of the state advanced 5.4 percent and were 39 percent less than in Maricopa County.

Arizona's strong per person gain in 1999 was less than the 6.5 percent rise in national per capita retail sales (which is defined somewhat differently – see box). The national advance was the greatest of the last two decades. Between 1995 and 1999, the Arizona figure increased 12 percent, compared to 15 percent nationally.

—Tom R. Rex
Research Manager

The retail sales data discussed in this article are derived from sales taxes collected by the Arizona Department of Revenue. This data source is limited in that it is designed to be an accounting series in which the emphasis is on collection of taxes, thus categorical and timing errors in the reports of retailers are not corrected. Information is available only for items subject to the general sales tax; food purchased to be consumed at home and gasoline are excluded. The categorical figures shown in Table 2 should be viewed as estimates. The Arizona data are not consistent with national data, which include food and gasoline but exclude sales made by companies whose primary business is not retail trade.

TABLE 1

ARIZONA RETAIL SALES
(Percent Change)

	Nominal	Real	Real per Capita
1992	7.7%	5.4%	2.6%
1993	9.0	6.2	3.1
1994	12.0	9.7	6.2
1995	8.8	6.5	3.3
1996	5.9	4.1	0.7
1997	7.0	5.3	2.2
1998	7.2	5.9	2.9
1999	10.0	8.4	5.4

TABLE 2

ARIZONA RETAIL SALES
(In Millions)

		Real Percent Change			
	1999	*1999*	*1998*	*1997*	*1991–99*
Not Categorized*	$12,013	10.3%	8.6%	4.5%	88%
Motor Vehicles	6,018	14.7	7.2	5.4	111
Restaurants and Bars	5,778	7.2	6.6	3.7	56
General Merchandise	3,682	2.2	–3.0	10.3	33
Food Stores**	2,881	5.6	3.2	6.2	26
Miscellaneous	2,594	7.2	3.6	5.3	32
Apparel and Accessories	2,145	3.6	9.9	5.9	30
Building Materials	1,932	9.0	5.5	4.6	71
Furniture Stores	1,932	9.0	6.5	1.7	79
Miscellaneous Vehicles	1,821	5.2	7.3	6.1	89
TOTAL	40,796	8.4	5.9	5.3	65

* Sales by companies whose primary business is not retail trade
** Sales of non-food items only

Source (Tables 1 and 2): Center for Business Research, L. William Seidman Research Institute, College of Business, Arizona State University. Retail sales from Arizona Department of Revenue. Inflation-adjustment uses the GDP Implicit Price Deflator of the U.S. Department of Commerce.

The value of ASU as a provider of education services

Arizona State University sponsors and supports a diverse set of activities that directly benefit the community, including pure and applied research, cultural events and other public service activities. But the primary mission of the university is to provide quality education for its students. The economic value of a college education is reflected in the earnings premium realized by workers with college degrees.

The purpose of this article is to estimate collectively for all students ASU has graduated over the past three decades, how much greater their current earnings are because of their college education. The estimate is made by combining information on the number of ASU degrees awarded since 1970 with U.S. Bureau of the Census data on the average earnings of workers with varying educational attainments.

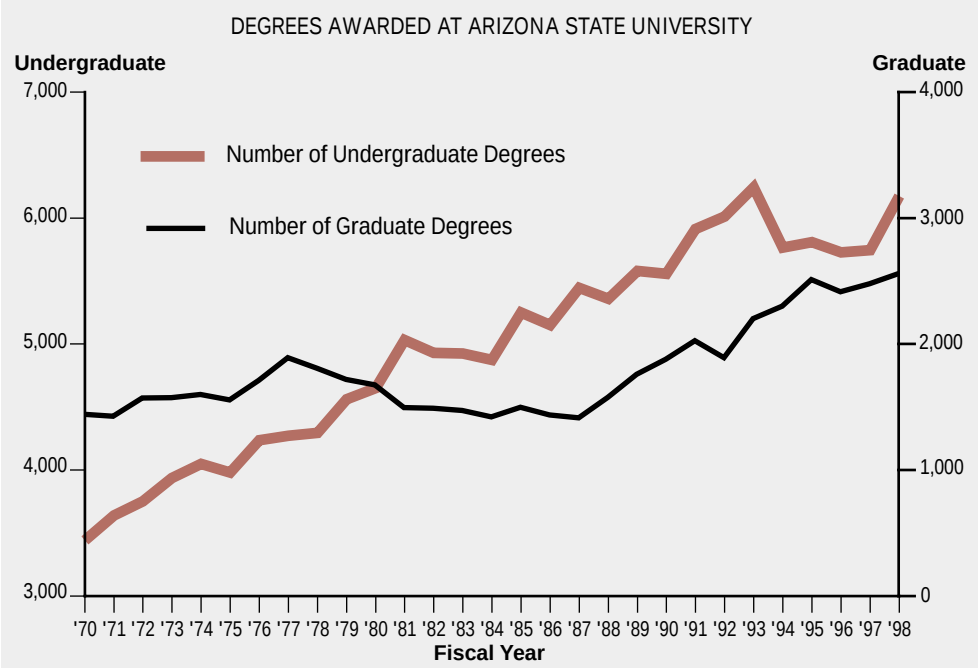
DEGREES AWARDED

ASU is a major provider of collegiate education services. The university awarded a total of 8,735 degrees during the 1997–98 academic year. This is up from 4,884 degrees awarded in 1969–70, 6,328 degrees in 1979–80, and 7,437 degrees in 1989–90.

Figure I provides a historical perspective on the number of undergraduate and graduate degrees awarded from ASU since 1970. Growth in undergraduate degrees has been relatively steady over the past three decades. Interest in graduate-level education has been more cyclical. Over the period from 1970 through 1977, graduate and undergraduate degrees grew at comparable rates, with graduate degrees accounting for between 28 and 30 percent of total degrees in each of those years. Graduate degrees awarded then declined almost continuously from 1978 through 1987, reaching a low of 1,413 degrees in 1986–87 and accounting for only 21 percent of total degrees awarded in that year. Since then, interest in graduate education has surged. Graduate degrees as a percent of total ASU degrees is near 30 percent currently.

The college within ASU awarding the most undergraduate degrees is the Liberal Arts College, with 2,007 degrees awarded in 1997–98 (or 33 percent of all undergraduate degrees). This is substantially higher than the 1,294 degrees the college awarded in 1987–88 (only 24 percent of all degrees in that year). The College of Business awarded 1,374 undergraduate degrees in 1997–98, the second highest in the university and 22 percent of the total. But 10 years earlier, the college had graduated 1,666 students, or 31 percent of the university total. Other colleges accounting for a high percentage of ASU undergraduate degrees are Public Programs (with 15 percent of all undergraduate degrees), Education (9 percent) and Engineering (9 percent).

FIGURE I



Source: Office of Institutional Analysis, Arizona State University.

The College of Business awarded the most graduate degrees during the 1997–98 academic year. The 505 degrees that year was 20 percent of total graduate degrees awarded. The College of Business also has shown the most growth in graduate degrees awarded. In 1987–88, the college awarded only 216 graduate degrees, or 14 percent of the total in that year. The College of Education had the second highest number of graduate degrees in 1997–98, with 479 degrees (19 percent of the total). This represents an absolute increase of 91 degrees over the number awarded 10 years earlier. But the College of Education accounted for a much higher percentage of total university graduate degrees at that time (25 percent in 1987–88). Other colleges that provide a large number of graduate degrees include Engineering, with 431 graduate degrees awarded in 1997–98 (17 percent of the total), and Liberal Arts, with 428 degrees awarded (17 percent of the total).

EARNINGS PREMIUM FOR COLLEGE GRADUATES

A college education provides important non-pecuniary benefits to a student — enhanced social skills, greater awareness of human achievement and an appreciation for cultural diversity. But college is increasingly viewed by students as an investment — an opportunity to acquire skills that are valued by employers and a means of increasing future earnings potential. Figure II illustrates, with recent earnings information for workers of different ages, the unmistakable connection between education and earnings. People who have completed high school earn more than those who have not; people with some college earn more than those with no college; those with a college degree earn more than those with a partial college education; and those with a graduate education earn more than those with only an undergraduate degree.

The earnings premium to a college education is substantial. Male workers between ages 30 and 34 earn on average $21,500 or 69 percent more if they have completed college than if they have only a high school degree. Men between ages 40 and 44 earn $30,000 or 82 percent more if they have a college degree. A college education also enhances the earnings power of women. Female workers between ages 30 and 34 earn $14,400 or 63 percent more with a college degree. Women between ages 40 and 44 earn $18,500 or 74 percent more with a college education.

The earnings premium to education has been increasing since the late 1970s (see Figure III). This trend seems to reflect a broad-based increase in the demand for skilled workers that is occurring throughout the industrialized world. A rising skill premium is evident not only in the earnings of educated workers but also in the earnings of those with work experience and skills acquired on the job. Labor market economists attribute the rise in the education/skills premium to several factors: skill-using technological advances (especially involving the computer), increased trade with less-developed countries, and a decline in the importance of unions and wage-setting institutions in some countries.

Although the high return to schooling should eventually lead to a greater supply of educated workers, the consensus opinion of experts is that the demand for skilled workers will continue to grow and the return to education will remain high into the foreseeable future.

VALUE OF ASU DEGREES

One can gain a sense of the economic value of ASU as a provider of education by using U.S. Bureau of the Census information on earnings of individuals by level of educational attainment. The most recent information from the 1998 Current Population Survey (CPS) is available by age and sex, as well as education. The data are national in coverage and include people who have been educated at schools throughout the country and are employed across all fifty states. More specific CPS information on earnings by education for the state of Arizona is too limited to be reliable, while decennial census data are 10 years old. In an age of high mobility, however, the job market is increasingly national in scope. Indeed, alumni records indicate that 48 percent of ASU graduates now reside outside the state of Arizona.

The incremental value of an undergraduate degree for an individual of a given age and sex is calculated as the difference between the mean earnings of U.S. workers of that age and sex who hold a bachelor's degree (and no more) and the mean earnings of workers with the same demographic characteristics who only completed high school and have no college experience. The incremental value of a graduate degree is calculated in a similar way using the difference between the mean earnings of workers with a graduate degree and the mean earnings of those with an undergraduate degree. The value of a college education increases with work experience. For example, the incremental value of an undergraduate degree is approximately $13,000 for a male fresh out of school but almost $36,000 for a male 50 years old. (To relate year of graduation to age, the calculations assume that individuals earn undergraduate degrees at the age of 21 and graduate degrees at the age of 25.)

Collectively, those who have graduated from ASU since 1970 earned $3.5 billion more in 1999 because of their collegiate education. Approximately one-half of ASU graduates currently reside in the state of Arizona, and mean earnings in Arizona are roughly 90 percent the national average. Together these facts suggest that Arizona income is some $1.6 billion higher because of education services provided by ASU.

Individuals who graduated during the 1970s earned $22,800 more per person because of their degrees; those graduating during the 1980s earned $20,890 more per person; and those graduating from 1990 through 1998 earned $11,540 more per person. On average, an ASU graduate earns almost $18,000 per year more because of his or her college education.

These figures demonstrate the soundness of an economic investment in a college education. A full-time student at ASU can expect to spend approximately $4,000 per year on tuition and fees. More importantly, time spent in class and studying is time that could be spent working. However significant these costs appear to be to a young adult, they are costs incurred for a period of perhaps four years. They should be compared with incremental earnings of some $18,000 per year to be earned over the entire working life of the student.

—Kent Hill
Research Economist

FIGURE II

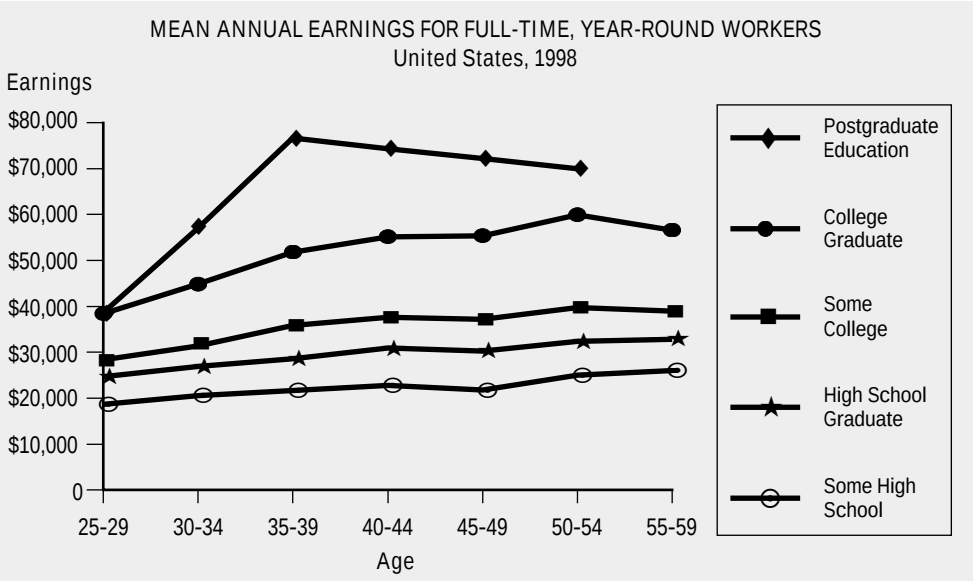
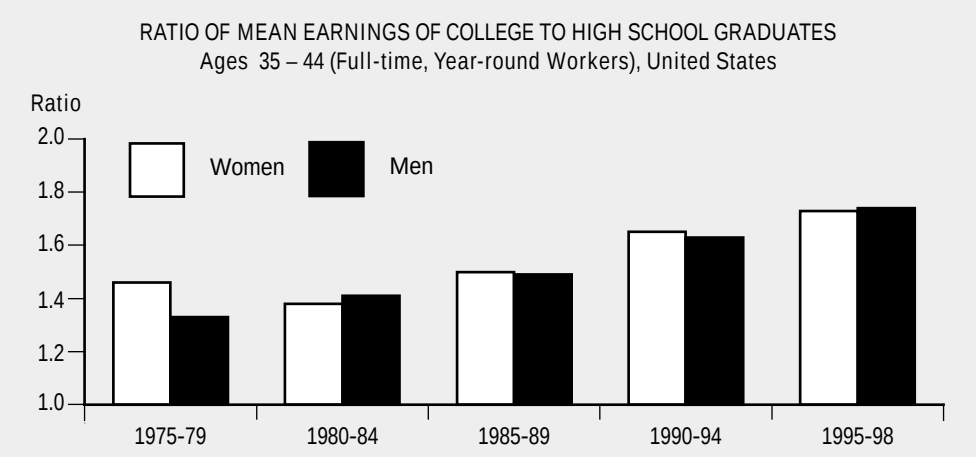


FIGURE III



Source (Figures II and III): U.S. Department of Commerce, Bureau of the Census, Current Population Survey.

Phoenicians spend more on housing and transportation

Residents of the Phoenix metropolitan area spend proportionately more of their total expenditures for housing and transportation, but less for food and health care, than the national average.

In 1998, the U.S. Bureau of Labor Statistics began collecting price and expenditure data in the Phoenix area as part of producing the national Consumer Price Index (CPI). While the decision whether to publish a CPI for the Phoenix area will be made at a later date, expenditure data for metropolitan Phoenix already are available for the first time from the Consumer Expenditure Survey.

The survey provides information on average annual expenditures by type for 28 metropolitan areas (the 26 most populous, plus Anchorage and Honolulu), four regions and the nation as a whole. Characteristics of the consumer units (households) that were surveyed also are provided.

NATIONAL

The profile of the 1998 national sample of households shows an average age of the reference person (head of household) of 48, with an average household size of 2.5 people and an average number of wage earners of 1.3. Nearly two-thirds of the households owned their home. Average income before taxes was $41,600. On average, 85 percent of the before tax income was spent ($35,500).

While average expenditures of low-income households were considerably less than those of higher-income households, these low-income households still spent far more than their incomes. Low-income households had a smaller average household size and disproportionately consisted of retirees. High-income households, many consisting of families with children living at home, spent less than their incomes. The highest incomes occurred in households where the head of household was between 45 and 54 years old. The lowest incomes were among retirees and very young adults. Expenditures per person were highest in the 45-to-64 age group and lowest among adults less than 35 years of age.

As discussed on page 6, incomes (and expenditures) vary widely by educational attainment. Those households with a head who was not a high school graduate had an average income of only $20,700 in 1998, with average expenditures of $21,400. In contrast, those households in which the householder had earned a college degree beyond a bachelor's degree had an average income of $79,900 and spent $59,000 on average. (The average household size of these two groups was nearly the same.) Similarly, incomes and expenditures vary widely with occupation.

Average annual expenditures rose 2.1 percent between 1997 and 1998, slightly in excess of the CPI inflation rate of 1.6 percent. Spending on food at home decreased while housing expenses increased 4 percent.

METRO PHOENIX

The household characteristics of those surveyed in the Phoenix area nearly matched those of the national sample. The average age of the household head was a little lower at 45, but the proportions of children and retirees were the same. (The Phoenix area has fewer middle-age adults and more young adults than the national average.) Corresponding to the younger age, a lesser proportion (57 percent) of the Phoenix area households owned their home.

The average income in the Phoenix area, $44,205, exceeded the national average by 6 percent, but only six of 28 metro areas had a lower figure. Average spending also was 6 percent higher in Phoenix. Income levels are highest in populous urban areas, as is the cost of living to a lesser extent. Adjusting for living costs, Phoenix ranked in the middle of the metro areas on both incomes and expenditures.

Purchasing patterns in the Phoenix area are somewhat different from the national average (see Table 1). Overall, Phoenicians in 1998 spent a lesser share of their total expenditures on food, health care and some miscellaneous categories, but a greater share on housing and transportation.

Phoenix area residents spent considerably less than the national average on food purchased at grocery stores, ranking 24th of the 28 metropolitan areas. Spending was particularly low on cereals and bakery products, meats (Phoenix ranked last among the 28 metros), and fruits and vegetables. In contrast, Phoenix figures on restaurant expenditures were marginally above average. Lesser shares of spending for health care, life insurance and tobacco products reflect a regional pattern.

Higher than the national average expenditures on housing also was in line with the West. Shelter costs in particular were high, but unlike the western region as a whole, these proportionately higher expenditures occurred only in rented dwellings; homeownership costs were average. Phoenix area residents also spent more on household operations, such as repair and maintenance. Unlike the western region, transportation spending was high in Phoenix, mostly in vehicle purchases.

–Tom R. Rex
Research Manager

TABLE 1

AVERAGE ANNUAL EXPENDITURES BY HOUSEHOLD
Phoenix Metropolitan Area, 1998

Selected Categories	Spending	Share of all Spending	Percentage of National Average	Rank Among 28 Metro Areas
Food at Home	$2,574	6.9%	92.6%	24
Food away from Home	2,170	5.8	106.9	13
Housing	12,958	34.6	110.6	18
Owned Dwellings	4,426	11.8	104.3	19
Rented Dwellings	2,406	6.4	121.6	13
Utilities	2,577	6.9	107.2	12
Apparel	1,902	5.1	113.6	15
Transportation	7,236	19.3	109.4	12
Health Care	1,736	4.6	91.2	19
Entertainment	1,898	5.1	108.7	11
Personal Insurance and Pensions	3,432	9.2	101.5	23
TOTAL EXPENDITURES	37,504	100.0	105.5	17
INCOME BEFORE TAXES	44,205		106.2	22

Source: Center for Business Research, L. William Seidman Research Institute, College of Business, Arizona State University from the Consumer Expenditure Survey, U.S. Department of Labor, Bureau of Labor Statistics.

1997 Economic Census: another four sectors available

Data from the 1997 Economic Census have been released for Arizona for four more sectors: utilities, management of companies and auxiliaries, transportation and warehousing, and finance and insurance. County and place data are not available for any of these sectors, though metropolitan area results are published in most cases. Results for 15 NAICS (North American Industry Classification System) sectors were available in early April 2000. Only three more sectors remained to be released by the U.S. Bureau of the Census, all scheduled for April or May.

UTILITIES

The utilities sector consists of three subsectors: electric power generation, transmission and distribution; natural gas distribution; and water, sewage and other systems. Its 1997 employment was second lowest of the 15 available sectors in Arizona, though its revenues placed it in the middle. The average number of employees per establishment and revenue per employee (a measure of productivity) each were second largest of the 15 sectors and payroll per employee was the highest.

Most data for the electric power and natural gas subsectors were not disclosed for Arizona and are shown combined in Table 1. (The federal government withholds data if the number of establishments in a category is small or if a few companies, with one or more establishments, dominate the sector.) The electric power subsector accounted for between 73 and 88 percent of the combined employment. Of 45 establishments, only eight generated power. The much smaller water, sewage and other systems subsector consisted mostly of establishments that supply water.

The Phoenix metropolitan area (Maricopa and Pinal counties) accounted for 71 percent of the state's revenue in the utilities sector, but only 59 percent of its employment (slightly less than its share of population). The Tucson metro area (Pima County) was responsible for 15 percent of the revenue and 18 percent of the employment, compared to 17 percent of population.

Per capita revenue and per capita employment in Arizona's utilities sector each was about 15 percent lower than the national average. The large establishment size and high revenue per employee each was slightly below the national average. Payroll per employee, however, was 8 percent higher than the national average.

MANAGEMENT AND AUXILIARIES

Management of companies and enterprises is split into two pieces. Data on corporate, subsidiary and regional managing offices are available, while information has not yet been released on holding companies. In addition, data on auxiliaries (establishments engaged in providing services to other establishments of the same enterprise) have been released.

Adding auxiliaries to corporate, subsidiary and regional managing offices places the employment of this sector in the middle of the 15 reported so far for Arizona. Since these types of establishments generally do not produce products or provide services to customers, sales were the lowest of any of the sectors. Payroll per employee in Arizona ranked second as the average wage in the management of companies subsector topped $50,000. Average employment size was the highest of the 15 sectors.

Nationally and in Arizona, employment in the auxiliaries subsector was greatest in the warehousing and storage industry group. Auxiliaries also were common in the scientific research and development services category.

Sales, both per capita and per employee, were far less in Arizona than the national average. Employment per capita was about 20 percent lower. Also below average were payroll per employee and average establishment size.

TRANSPORTATION AND WAREHOUSING

As a whole, this sector's employment was in the mid-range of the 15 available sectors, with revenues toward the low end. Establishment size, revenue per employee and payroll per employee all ranked in the middle.

Transportation of goods and passengers made up most of this sector. Trucking was by far the largest subsector, based on both employment and revenue. Support activities, such as air traffic control and arrangement of freight transportation, was a relatively large subsector, as was pipelines, which had extremely high revenue per employee and high payroll per employee. The couriers and messengers subsector was second largest of all the subsectors and had a large average establishment size.

The Phoenix metro area dominated the state, with 74 percent of the sector's revenue and 80 percent of its employment. The Tucson area contributed less than 10 percent of the state total.

Revenue per capita in transportation and warehousing was 25 percent less than the national average, while employment per capita was 10 percent less. Most subsectors contributed to these low figures, with only the couriers and messengers subsector above the national norm for revenue per capita. Revenue per employee and payroll per employee each was 15 to 20 percent below average.

FINANCE AND INSURANCE

The revenue of the finance and insurance sector, even excluding insurance carriers (for which figures were not reported for Arizona), was fourth highest of the 15 available sectors. Employment was fifth highest, though less than half that of the fourth ranking sector. Revenue per employee and payroll per employee each ranked fourth. The Phoenix metro area was even more dominant in this sector, accounting for 85 percent of the state's jobs.

The largest of four subsectors, especially in terms of employment, was credit intermediation. Its largest component was commercial banks, with sales financing, consumer lending, credit card issuing and credit unions being other sizable components.

Insurance carriers, agencies and brokerages was the second largest subsector. Insurance carriers, mostly dealing with life, health, property and casualty insurance, employed nearly as many as commercial banks and paid a higher average wage. Securities intermediation paid a much higher average wage than the other subsectors. It includes securities brokerages, investment banking and securities dealings, portfolio management and other activities. Real estate investment trusts (REITs) were the only portion of the funds, trusts and other financial vehicles subsector included in the economic census. Revenue per employee in REITs was especially high.

Revenue per capita in Arizona was far less than the national average in the finance and insurance sector. It was particularly low in securities intermediation. Employment per capita was only 15 percent below average, as the low figure in the securities subsector was partially offset by a high figure in the insurance subsector. The sector as a whole had very low revenue per employee and payroll per employee relative to the national average.

OTHER SECTORS

National data have been released for four sectors for which Arizona data were reviewed in earlier issues of *AZB/Arizona Business*. In the professional, scientific and technical

services sector, per capita receipts in Arizona were 33 percent less, and per capita employment was 15 percent less, than the national average in 1997. Arizona was below average in all nine subsectors on each measure. Receipts per employee were 25 percent below average and payroll per employee was 11 percent below average. The average establishment size also was considerably below the national norm.

The comparisons were considerably different in the other three sectors. In the arts, entertainment and recreation sector, per capita receipts in Arizona were 39 percent higher than the national average in 1997. Per capita employment was 18 percent higher. Employment per establishment was very high in Arizona, receipts per employee were above average and payroll per employee was marginally higher than the national average. Arizona's per capita receipts and employment were considerably above average in the small museums and historical sites subsector and in the much larger amusement, gambling and recreation subsector. In the gambling portion of the latter subsector, receipts per person were more than three times the national average and the number of workers per resident was 73 percent higher. While about average in the performing arts and spectator sports subsector, Arizona was above average in the spectator sports portion and below average in performing arts.

In the accomodation and food services sector, Arizona's per capita sales and employment also were greater than the national average. This was particularly true in the accomodation subsector, which reflects the state's large number of tourists and seasonal residents. In this subsector, per capita sales were 31 percent, and per capita employment was 41 percent, above average. Average establishment size also was above average in both subsectors, but sales per employee were slightly below average and payroll per employee was about average.

Within the administrative and support and waste management and remediation sector, per capita receipts and employment in Arizona were above average in the administrative and support subsector, which makes up about 95 percent of the total. Arizona was well above average in employment services (such as temporary workers), business support and travel arrangement. Average establishment size was large. Receipts per employee were 20 percent below average and payroll per employee was 6 percent less than the national average. Arizona was far below the national average on all measures in the waste management and remediation subsector.

Of the 15 sectors for which 1997 data have been released, Arizona's per capita sales (or receipts or revenues, depending on sector) were above average in four and below average in eight. Per capita employment was above average in five and below average in eight.

—Tom R. Rex
Research Manager

TABLE 1

ECONOMIC CENSUSES, ARIZONA, 1997

	Number of Establishments	Revenue* in Millions	Payroll in Millions	Employment	Employment per Establishment	Revenue*per Employee	Payroll per Employee
UTILITIES TOTAL	235	$5,840	$595	10,546	44.9	$553,800	$56,500
Electric Power and Natural Gas	86	5,692	553	9,243	107.5	615,800	59,900
Water and Sewerage	149	148	42	1,303	8.7	113,600	32,000
MANAGEMENT AND AUXILIARIES TOTAL	920	164	2,047	44,376	48.2	3,700	46,100
Management of Companies	710	129	1,700	33,703	47.5	3,800	50,400
Auxiliaries	210	35	347	10,673	50.8	3,300	32,500
TRANSPORTATION AND WAREHOUSING TOTAL	2,257	4,086	1,107	45,233	20.0	90,300	24,500
Air Transportation	62	205	22	844	13.6	242,500	25,700
Truck Transportation	1,236	2,017	587	23,467	19.0	86,000	25,000
Ground Passenger Transportation	155	147	71	3,799	24.5	38,700	18,600
Pipeline Transportation	31	447	17	300	9.7	1,490,900	58,000
Transportation Support Activities	477	459	134	4,705	9.9	97,600	28,500
Other Transportation**	36	39	9	523	14.5	74,100	17,400
Couriers and Messengers	181	712	249	10,797	59.7	66,000	23,000
Warehousing and Storage	79	60	18	798	10.1	74,700	23,100
FINANCE AND INSURANCE TOTAL***	6,568	11,905	3,008	84,970	12.9	181,500	35,400
Credit Intermediation	2,642	8,962	1,371	45,314	17.2	197,800	30,200
Securities Intermediation	832	1,313	391	6,905	8.3	190,200	56,600
Insurance Carriers and Agencies***	3,070	1,370	1,215	31,826	10.4	110,000	38,200
Real Estate Investment Trusts	24	260	31	925	38.5	280,700	33,900

* For the auxiliaries sector, sales are measured
** Includes water transportation and scenic and sightseeing transportation
*** Excludes revenue of insurance carriers, which is unavailable

Source: Center for Business Research, L. William Seidman Research Institute, College of Business, Arizona State University using data from the U.S. Department of Commerce, Bureau of the Census, *1997 Economic Censuses, Arizona.*

Arizona employment growth in 1999 revised up

Every year the Arizona Department of Economic Security (DES) revises its monthly non-farm wage and salary employment estimates (hereafter simply referred to as employment) for the year just ended and for the prior year. The estimates are derived from a survey of employers and are revised as more complete data become available. The latest revision produced slightly lower figures for 1998, but higher figures for 1999, for Arizona.

Based on the revised figures, annual average employment rose 85,600 (4.1 percent) in Arizona in 1999, the fifth consecutive year of slightly slower growth than the year before; peak growth in 1994 was 107,700. The 1999 gain still was historically strong, exceeded only in 1984, 1985 and (marginally) 1978.

The nation also experienced somewhat slower employment growth in 1999, with an annual average increase of 2.8 million (2.2 percent) compared to 3.1 million (2.6 percent) in 1998. The 1999 gain was above that of 1996, but lower than the other years from 1994 through 1998.

While annual average growth was less in 1999, the year-end 1999 growth was stronger than at year-end 1998. Until late 1998, year-over-year employment gains (a comparison, for example, of June 1998 to June 1997) exceeded 90,000 and 4.5 percent. Growth slowed substantially during fourth quarter 1998, with year-over-year advances dropping below 80,000 and 4 percent. Growth accelerated during 1999, with year-over-year gains back to 90,000 and exceeding 4 percent during the fourth quarter.

The slowdown in Arizona's employment growth in late 1998 occurred primarily in the Phoenix metropolitan area. Annual average gains in the Tucson area were slightly higher in 1999 than in 1998, while growth in the balance of the state rebounded from the low figures of 1998. More than 75 percent of the state's 1999 numeric employment increase occurred in the Phoenix area for the fifth consecutive year. The Phoenix area's advance of 4.6 percent was well above that of the Tucson area (3.2 percent) and the balance of the state (3.0 percent).

The services industry accounted for 62 percent of the state's total employment increase in 1999, its largest share during the eight years of economic expansion. Employment growth in services was strong across the state. The 53,400 rise in services employment compares to 14,100 in second-place retail trade. Within services, business services posted a particularly strong increase. Other non-goods-producing industries — finance, insurance and real estate; transportation, communications and public utilities; government and wholesale trade — experienced lesser gains in 1999 than in 1998.

Construction continued to post strong advances, but manufacturing employment declined in 1999 after six years of moderate or stronger growth. Mining employment decreased for the third straight year. Goods-producing industries accounted for only 6 percent of the state's 1999 employment gain (5 percent in Maricopa County). The share was 30 percent in Pima County, but goods-producing jobs decreased in the balance of the state.

—Tom R. Rex
Research Manager

AZ Purchasing Managers Index up again in March

The Arizona Purchasing Managers Index advanced again in March. The seasonally adjusted index shifted upward to 62.0 from 56.9 in February. An Arizona Purchasing Managers Index reading of over 50 percent generally indicates that the local economy is growing, while a reading below 50 percent suggests a slowdown in the overall level of economic activity in the near term.

ANALYSIS

The overall index showed impressive strength in March, rising to the highest level since June 1997. New orders, production and employment grew sharply while inventory levels held steady, and delivery times slipped.

Prices paid for major commodities rose to 70.4 from 64.0. The price index continues to trend upward, reaching a level not seen for nearly five years.

Approximately one-third of survey respondents noted an increase in new hires in March, while 56 percent reported no change over the month. Both Phoenix and Tucson metropolitan areas continue to outpace the nation with regards to healthy employment growth.

—Yolanda Strozier
Research Economist
Bank One Economic Outlook Center

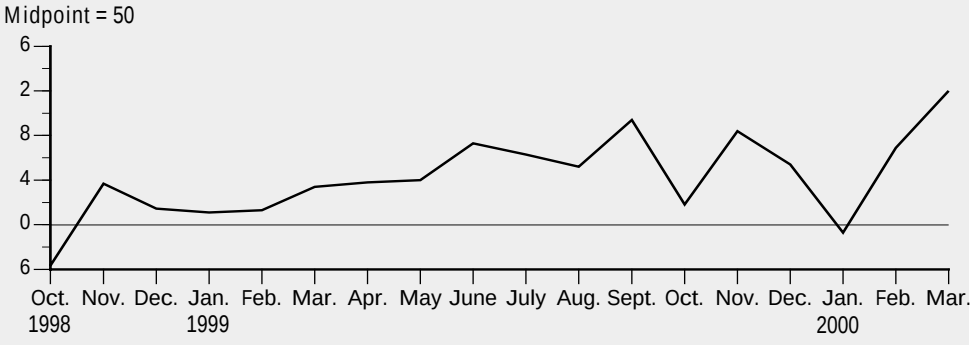
TABLE 1

ARIZONA PURCHASING MANAGERS INDEX AND PRICE INDEX

	Mar.	Feb.	Jan.	Dec.	Nov.	Oct.
Overall Index	62.0	56.9	49.3	55.4	58.4	51.8
Delivery Times	64.8	67.4	60.0	62.7	68.6	59.4
Purchased Materials Inventory Level	51.3	52.8	42.8	44.8	51.0	50.5
New Orders	65.6	58.7	47.9	54.9	55.1	55.8
Production	63.2	56.3	47.3	60.6	66.0	50.5
Employment	58.2	49.5	49.2	49.6	50.2	42.4
Price Index	70.4	64.0	67.2	57.8	65.0	68.0

FIGURE I

ARIZONA PURCHASING MANAGERS INDEX*



* Excludes Price Index

Source: (Table 1 and Figure I): Bank One Economic Outlook Center, L. William Seidman Research Institute, College of Business, Arizona State University.

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ARIZONA ECONOMIC INDICATORS

	Month or Quarter	Current Value	Previous Value	Percent Change Previous Period	Percent Change from Year Ago	Year-to-Date Value	Year-to-Date Percent Change from Year Ago
LEADING ECONOMIC INDEX (1987 = 100)							
Arizona	Jan.	109.2	109.4	–0.2	2.5	NA	NA
PURCHASING MANAGERS INDEX							
Arizona	March	62.0	56.9	8.8	16.4	NA	NA
BUILDING PERMITS (Thousands of $)							
Maricopa County	Feb.	662,722	542,491[r]	22	–13	1,205,213	–13
Pima County	Feb.	118,226	77,307	53	43	195,533	18
Balance of State	Feb.	107,163	119,367[r]	–10	–27	226,530	–20
Arizona	Feb.	888,111	739,165[r]	20	–11	1,627,276	–11
TOTAL HOUSING UNITS AUTHORIZED							
Maricopa County	Feb.	4,210	2,848[r]	48	12	7,058	–12
Pima County	Feb.	698	522	34	24	1,220	12
Balance of State	Feb.	1,031	1,054[r]	–2	–11	2,085	–8
Arizona	Feb.	5,939	4,424[r]	34	8	10,363	–9
HOME SALES							
Maricopa County - Number	Feb.	6,070	8,140	–25.4	–3.8	14,210	17.2
Maricopa County - Median Price($)	Feb.	129,000	126,000	2.4	8.2	127,500	6.3
HOUSING AFFORDABILITY INDEXES							
Metropolitan Phoenix - New Homes	4th Qtr.	94	94	0.0	–13.8	NA	NA
Metropolitan Phoenix - Resale Homes	4th Qtr.	114	114	0.0	–14.3	NA	NA
MORTGAGE RATES (30-year Fixed)							
Maricopa County	March	7.8	7.8	0.0	18.2	NA	NA
POPULATION ESTIMATES (Thousands)							
Maricopa County	4th Qtr.	2,924	2,903	0.7	3.1	NA	NA
Arizona	4th Qtr.	4,900	4,869	0.6	2.7	NA	NA
RETAIL SALES (Millions of $)							
Maricopa County	Feb.	2,392	2,247	6.5	14.1	4,639	12.4
Arizona	Feb.	3,498	3,264	7.2	12.2	6,762	11.3

Note: The above figures reflect the latest data available as of date of publication and are subject to revision. NA = Not Applicable [r] = Revised

Source: Center for Business Research, Arizona Real Estate Center, and Bank One Economic Outlook Center, affiliates of the L. William Seidman Research Institute, College of Business, Arizona State University. Retail sales data are from the Arizona Department of Revenue.