

A Revenue Forecasting Model for the Pima County RTA Updated to 2018

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Regional Transportation Authority

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Executive Summary

This report presents updated 30-year revenue projections for the Regional Transportation Authority (RTA). The original enabling legislation allowed counties to develop a referendum that, if passed, would impose a sales tax rate on taxable sales categories at 10 percent of the Arizona state sales tax rate. The resulting RTA tax rate for most taxable sales categories is 0.5 percent, with the exception of hotels/motels (0.55 percent). Total RTA revenues are derived by summing forecasts for: hotels/motels, communications, contracting, restaurants and bars, personal rentals, retail, utilities, and other categories.

The revenue projections are derived from an econometric model that relates the Pima County sales tax base to relevant indicators of macroeconomic performance at the county and national level. Forecasts are provided for three alternative scenarios: baseline, optimistic, and pessimistic. The baseline scenario assumes no national recession during the forecast. The optimistic scenario assumes stronger growth in the short and long-term than envisioned in the baseline. The pessimistic scenario assumes a moderate national recession in the near term, followed by weaker growth and higher inflation in the long run.

Total RTA collections during the 30-year period from fiscal year 2019 to 2048 are forecast to total \$4.075 billion, before adjustment for inflation. The intermediate projections call for collections of \$458 million from 2019 to 2023, \$989 million from 2019-2028, and \$2.310 from 2019-2038. Under the optimistic scenario, RTA revenues during the 30-year period rise to \$4.442 billion, while revenues under the pessimistic scenario total \$4.121 billion. Note that total revenues under the pessimistic scenario exceed the baseline. This is driven by higher projected inflation in the pessimistic scenario. After adjustment for inflation, revenues in the pessimistic scenario fall far below the baseline and optimistic results.

The remainder of this report includes an overview of sales-tax related revenues for the RTA, including an analysis of historical factors driving past trends. Then I turn to the forecast, with a summary of the macroeconomic forecasts for the Tucson MSA, and the revenue projections for the RTA under alternative scenarios. I then provide a summary of the data, econometric model, variable notation, and regression equations used to generate the revenue forecasts. I conclude the report with the Forecasting Project Third Quarter 2018 Economic Outlook publication, which provides more detail on the macroeconomic outlook used to drive the revenue forecasts. Also provided as part of this report are six Excel files with data and tables containing the annual and cumulative RTA revenue forecasts. The filenames are:

RTA_2019_baseline.xls...baseline scenario forecasts, current dollars
RTA_2019_optimistic.xls...optimistic scenario forecasts, current dollars
RTA_2019_pessimistic.xls...pessimistic scenario forecasts, current dollars
RTA_2019_baseline_2020dollars.xls...baseline scenario forecasts, inflation adjusted
RTA_2019_optimistic_2020dollars.xls...optimistic scenario forecasts, inflation adjusted
RTA_2019_pessimistic_2020dollars.xls...pessimistic scenario forecasts, inflation adjusted

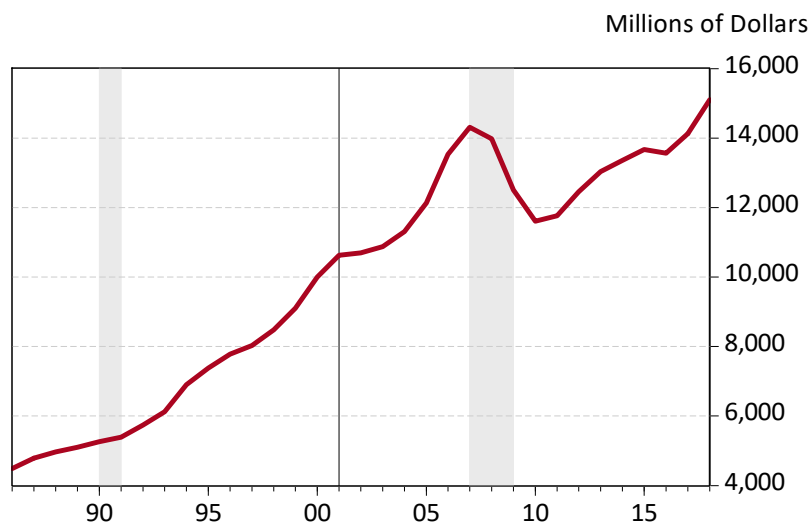
A Revenue Forecasting Model for the Pima County RTA

Introduction

This report presents updated revenue projections for the Regional Transportation Authority (RTA). The original enabling legislation allowed counties to develop a referendum that, if passed, would impose a sales tax rate on taxable sales categories at 10 percent of the Arizona state sales tax rate. The resulting RTA tax rate for most taxable sales categories is 0.5 percent, with the exception of hotels/motels (0.55 percent). Total RTA revenues are derived by summing forecasts for: hotels/motels, communications, contracting, restaurants and bars, personal rentals, retail, utilities, and other categories.

Let's first examine long-run trends in the sales tax base and some major influencing factors. Exhibit 1 shows total taxable sales (the sales tax base) for the RTA from 1986 to 2018, before inflation adjustment, with U.S. recessions shaded.¹ Note that the national recessions in the early 1990s and 2000s slowed growth in the tax base, but did not produce significant declines. In stark contrast, the Great Recession (2007-2009) generated a massive drop in the tax base, similar to the huge decline in jobs experienced at the time. From the peak in 2007 to the trough in 2010, the RTA tax base declined by \$2.7 billion or 18.9 percent.

Exhibit 1: Total Estimated Tax Base of the RTA, Fiscal Year, U.S. Recessions Shaded



¹ In order to show a long-term trend, Exhibit 1 displays the seven largest taxable sales categories in Pima County: retail, restaurants and bars, utilities, contracting, communications, personal rentals, and hotels and motels. Hotel/motel taxable sales are adjusted to reflect the RTA tax rate.

After hitting bottom in 2010, the tax base began to grow again and is now, eight years later, finally above the 2007 peak. Since 2010, tax base growth averaged 3.4 percent per year, before adjustment for inflation.

Note that tax base growth surged in fiscal year (FY) 2018, hitting 6.9 percent, which was the fastest increase since the Great Recession. That was driven in large part by a rapid increase in contracting of 33.4 percent. Sales at hotels and motels and rentals of personal property also generated double-digit growth rates last fiscal year. Retail, the largest category, increased by 4.3 percent.

While the RTA tax base has exceeded the previous peak before adjustment for inflation, the story changes when we remove the impact of rising prices, using the U.S. consumer price index for all urban consumers. Exhibit 2 shows the RTA tax base adjusted for inflation, from 1986 to 2018. The real tax base peaked in 2007, but did not hit bottom until 2011, posting a peak-to-trough decline of 24.1 percent. Growth resumed in 2012, but at a halting pace which averaged 1.6 percent per year through 2018. Further, after accounting for inflation, the tax base was still 13.2 percent below the 2007 peak in FY2018.

Exhibit 2: Total Inflation-Adjusted Estimated Tax Base of the RTA, Fiscal Year, U.S. Recessions Shaded

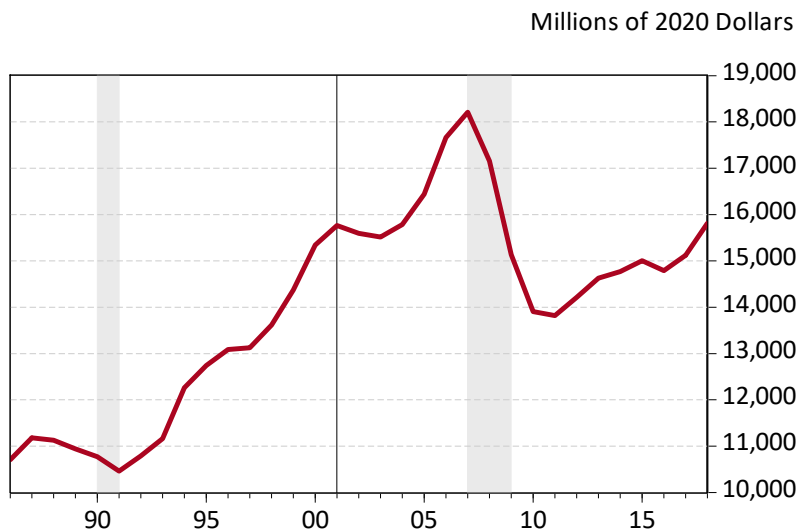
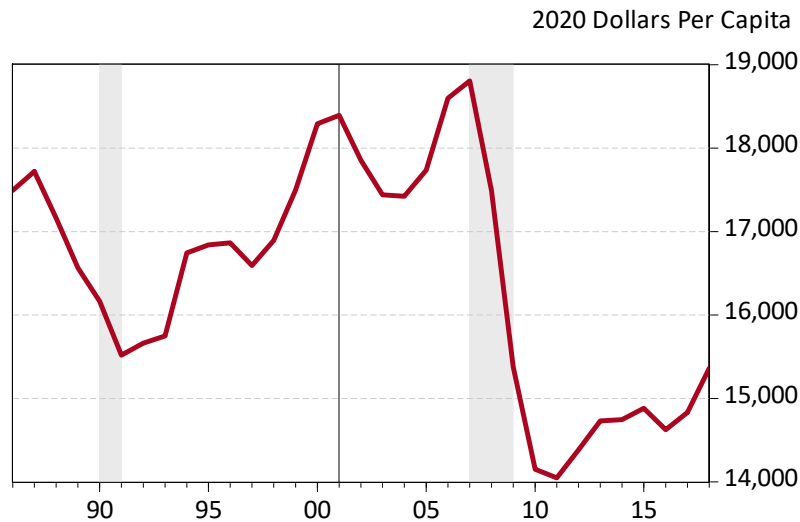


Exhibit 3 shows how the real tax base has evolved on a per capita basis. This also illustrates the devastating impact of the Great Recession, with the real per capita tax base declining from \$18,804 in 2007 to \$14,048 in 2011. That translated into a 25.3 percent drop. Growth resumed in 2012 and averaged 1.3 percent per year through 2018. By this measure the tax base remained 18.3 percent below the 2007 peak in 2018.

**Exhibit 3: Per Capita Inflation-Adjusted RTA Tax Base, Fiscal Year,
U.S. Recessions Shaded**



The tax base has been declining relative to income for more than 30 years, as Exhibit 4 shows. In 1986 the ratio was 53.9 percent. In the decades since, it has fallen significantly, reaching 34.6 percent in 2017. The latest income data available ends in 2017. Deterioration in the tax base relative to income reflects a number of factors, including a shift of consumer spending away from goods and toward services (like health care) which are not taxed.

**Exhibit 4: RTA Tax Base Relative to Pima County Personal Income, Fiscal Year,
U.S. Recessions Shaded**

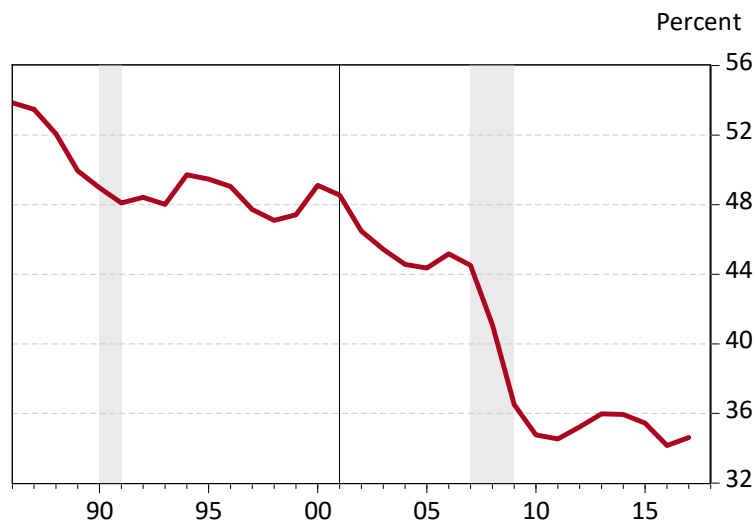
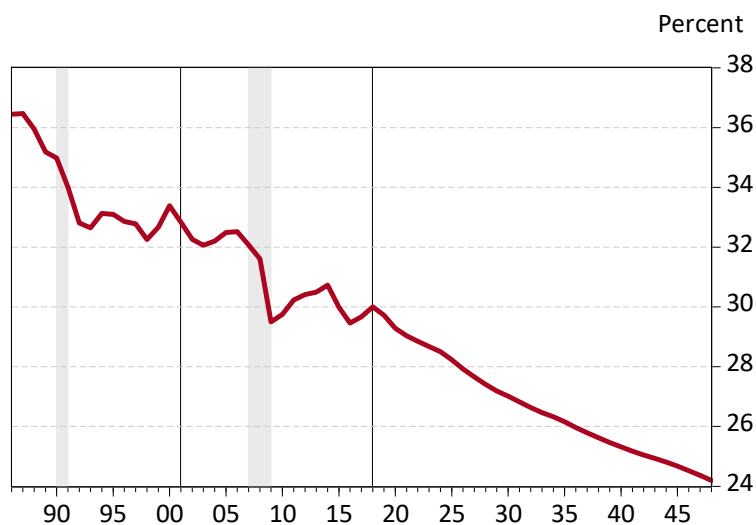


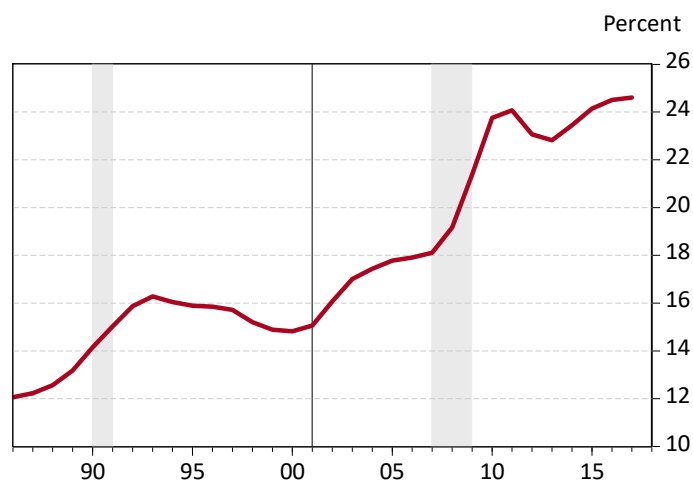
Exhibit 5 shows the ratio of consumption of goods to disposable income for the U.S. The exhibit shows that the same trend has been playing out nationally, with the goods consumption (by households) falling from 36.4 percent in 1986 to 30.0 percent by 2018. Note that the long-term forecast calls for the trend to continue during the next 30 years.

Exhibit 5: U.S. Consumption of Goods Relative to Disposable Income, Fiscal Year, U.S. Recessions Shaded



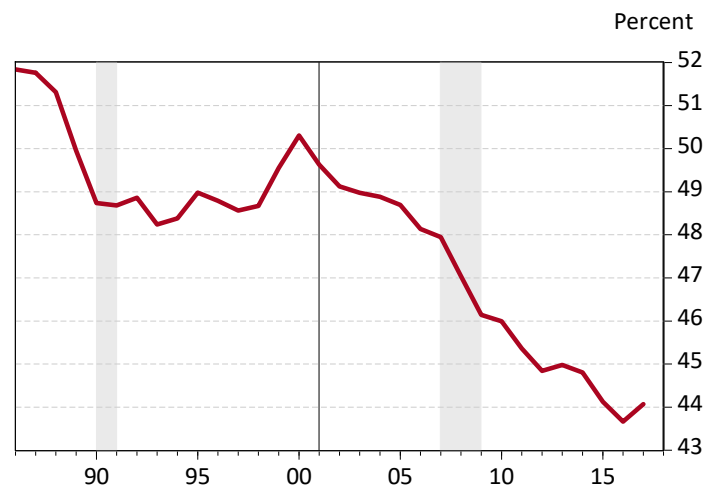
Another factor driving this trend is illustrated by the ratio of transfer payments to personal income (Exhibit 6). Transfer payments (primarily by governments to households) include Medicare, Medicaid, Social Security, and welfare payments. This ratio has more than doubled since 1986, from 12.1 percent to 24.6 percent in 2017. This reflects demographic shifts (aging of the baby boom generation) and the lingering impacts of the Great Recession.

Exhibit 6: Share of Pima County Personal Income from Transfer Payments, Fiscal Year, U.S. Recessions Shaded



The Great Recession hit Pima County hard, with large job losses. One way to illustrate this is by the share of wages and salaries to personal income (Exhibit 7). Note that the ratio was already trending down before 2007, reflecting growth in transfer payments and asset income (dividends, interest, and rental income). The ratio nosedived during the Great Recession, falling from 47.9 percent in 2007 to 44.1 percent in 2018. The declining wage share reflects in part the slow recovery in Pima County since the end of the Great Recession, which has depressed job and wage gains.

Exhibit 7: Share of Pima County Personal Income From Wages and Salaries, Fiscal Year, U.S. Recessions Shaded



Forecasts of RTA Tax Revenues

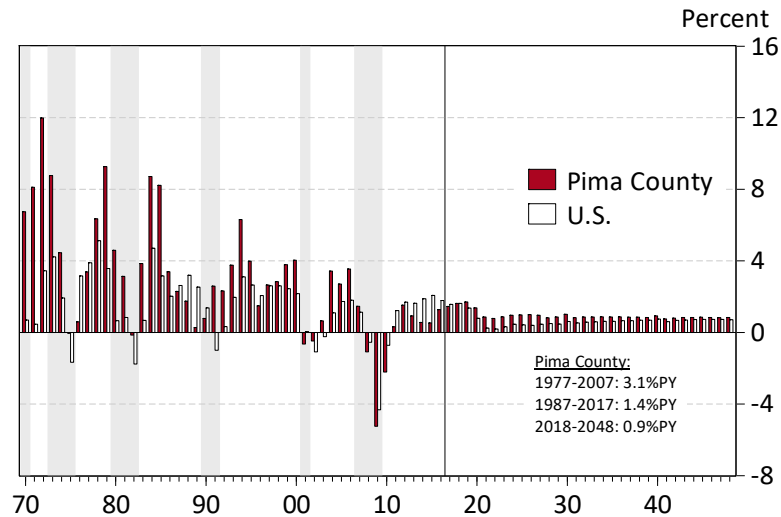
The RTA sales tax base depends on the economic performance of Pima County. Forecasts for Pima County economic variables come from the Forecasting Project at the Economic and Business Research Center in the Eller College at the University of Arizona. These forecasts are generated quarterly, with a 30 year forecast created in August of the year. The long-term forecast used in this study was generated in August 2018. It includes a baseline (or control) forecast, as well as two alternative scenarios: optimistic and pessimistic. The baseline forecast was assigned a probability of 65 percent. The pessimistic scenario was assigned a probability of 20 percent and the optimistic scenario had a probability of 15 percent.²

The baseline forecast for Pima County calls for continued growth through the 30 year forecast period. As Exhibit 8 shows, the forecast calls for job growth to gradually slow during the forecast period. Overall, Pima County job growth is forecast to average 0.9 percent per year

² During the past six months, the odds of recession have risen modestly. IHS Markit, which provide the national data underpinning the Pima County forecast, now gives the baseline scenario a 60 percent probability, with the pessimistic assigned 30 percent. The optimistic scenario has a 10 percent probability.

through 2048. That's well below the average growth rate for the past 30 years of 1.4 percent per year.

**Exhibit 8: Pima County and U.S. Job Growth,
U.S. Recessions Shaded**



The story is similar for population growth, as Exhibit 9 shows. Pima County population growth is projected to average 0.7 percent per year through 2048, which is well below the average of 1.6 percent per year during the previous 30 years.

Population and job growth are also projected slow nationally, not just in Pima County. The driving force behind the slowdown is demographic aging, in particular the aging of the baby boom generation.

**Exhibit 9: Pima County and U.S. Population Growth,
U.S. Recessions Shaded**

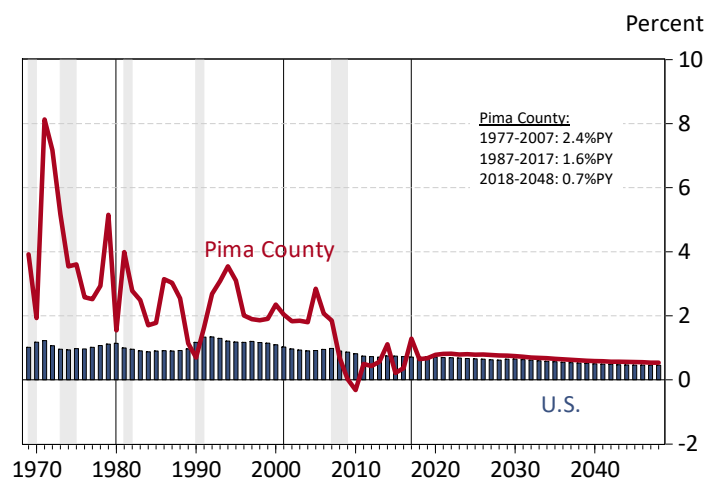


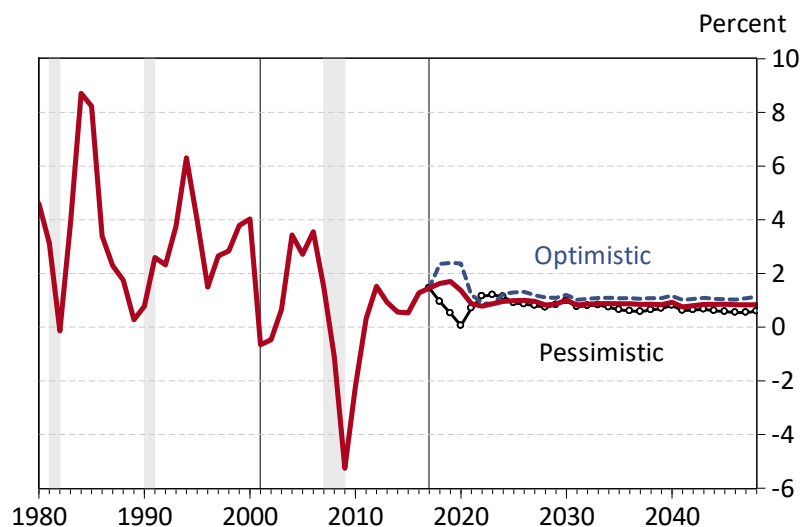
Exhibit 10 summarizes the baseline 30 year forecast for Pima County by decade for population, jobs, and personal income. Note that growth rates summarize activity during the previous decade. Thus, the annual population growth rate from 2008 to 2018 was 0.5 percent per year. Note that job, population, and income growth rates gradually decline as we move through the forecast. Keep in mind that the growth rates for the 2008-2018 period include the Great Recession and are relatively low.

**Exhibit 10: Pima County Forecasts for Population, Jobs, and Income
Growth Rates Are the Average of Previous Decade**

	2008	2018	2028	2038	2048
Population (000s)	984	1,033	1,116	1,195	1,264
Ann. %Ch.		0.5	0.8	0.7	0.6
Nonfarm Jobs (000s)	381	383	425	463	504
Ann. %Ch.		0.1	1.0	0.9	0.8
Personal Income (Bil\$2010)	35	36	45	56	68
Ann. %Ch.		0.3	2.2	2.2	2.0

Exhibit 11 shows how job growth differs under the alternative scenarios. The pessimistic scenario assumes a moderate national recession in the second half of 2019. This takes the wind out of Pima County's sales with job growth dropping to zero by 2020. Thereafter growth recovers before again falling below the baseline after 2030. In contrast, job growth is much stronger in the near term under the optimistic scenario. However, after the initial burst, job gains decelerate to a pace closer to the baseline.

**Exhibit 11: Pima County Job Growth Under the Baseline and Alternative Scenarios
U.S. Recessions Shaded**



The macroeconomic forecasts for Pima County combine to generate revenue projections for the RTA using econometric model specifications provided in detail in later sections of this report. Exhibit 12 provides a summary table for the baseline nominal (before adjustment for inflation) projections.

As the exhibit shows, total collections during the 30-year period are expected to total \$4.075 billion, before adjustment for inflation. The intermediate projections call for collections of \$458 million from 2019 to 2023, \$989 million from 2019-2028, and \$2.310 from 2019-2038.

Exhibit 12: Projected Yield for the RTA, Thousands of Nominal Dollars, Baseline Scenario, Fiscal Year

	Actual				Cumulative Over Period			
	2015	2016	2017	2018	5 years 2019-2023	10 years 2019-2028	20 Years 2019-2038	30 years 2019-2048
Hotel/Motel	1,760	1,810	1,910	2,150	11,340	22,640	46,630	74,540
Communications	1,840	1,540	1,390	1,410	7,370	16,220	37,170	61,410
Contracting	6,420	4,630	5,290	7,060	44,270	96,380	228,530	398,400
Restaurant & Bar	8,460	8,810	9,220	9,560	56,430	128,330	315,830	568,510
Rental - Personal	2,110	2,040	2,120	2,350	12,980	27,220	61,440	109,390
Retail	40,630	42,180	43,490	45,350	251,100	540,780	1,265,470	2,251,140
Utilities	7,120	6,820	7,210	7,640	41,080	89,490	214,490	394,990
Other	5,490	7,210	5,850	6,270	33,410	68,050	140,580	216,990
Total	73,830	75,040	76,480	81,790	457,990	989,100	2,310,140	4,075,360

Source: Economic and Business Research Center, Eller College, University of Arizona
Updated 4-30-19

Exhibits 13 and 14 show the time trend for annual nominal revenues from 2006 to 2048. Revenues are forecast to increase from \$81.8 million in fiscal year 2018 to \$201.3 million by 2048 (Exhibit 13).

Exhibit 13: Projected Yield for the RTA, Thousands of Nominal Dollars, Baseline Scenario, Fiscal Year, U.S. Recession Shaded

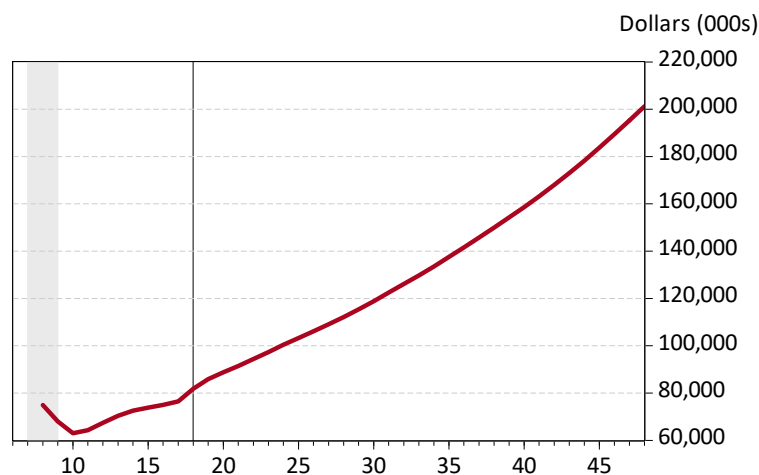


Exhibit 14 shows annual growth rates for RTA revenues. Annual growth is forecast to decelerate from 6.9 percent in 2018 to 5.1 percent in 2019 and then gradually to the 3.0 percent per year range.

**Exhibit 14: Growth of the Projected Yield for the RTA, Nominal Dollars
Baseline Scenario, U.S. Recession Shaded**

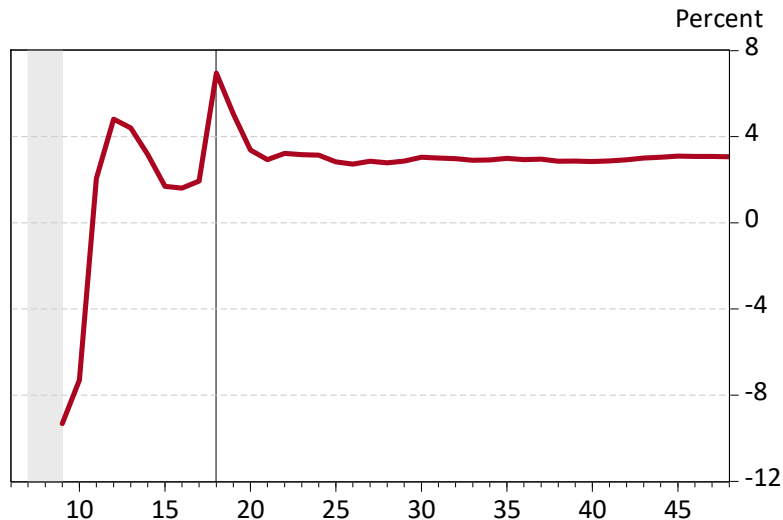


Exhibit 15 shows projected yields for the RTA under the optimistic scenario, before adjustment for inflation. Under these assumptions, projected revenues rise to \$4.442 billion during the 30-year period.

**Exhibit 15: Projected Yield for the RTA, Thousands of Nominal Dollars
Optimistic Scenario**

	Actual				Cumulative Over Period			
	2015	2016	2017	2018	5 years 2019-2023	10 years 2019-2028	20 Years 2019-2038	30 years 2019-2048
Hotel/Motel	1,760	1,810	1,910	2,150	11,350	22,650	46,630	74,530
Communications	1,840	1,540	1,390	1,410	8,120	19,030	47,700	86,740
Contracting	6,420	4,630	5,290	7,060	44,540	97,250	232,120	407,510
Restaurant & Bar	8,460	8,810	9,220	9,560	57,580	131,450	324,130	580,440
Rental - Personal	2,110	2,040	2,120	2,350	13,300	28,310	65,670	119,310
Retail	40,630	42,180	43,490	45,350	261,800	574,530	1,387,660	2,543,380
Utilities	7,120	6,820	7,210	7,640	41,390	90,510	218,860	407,040
Other	5,490	7,210	5,850	6,270	33,690	68,870	143,490	223,400
Total	73,830	75,040	76,480	81,790	471,770	1,032,600	2,466,260	4,442,330

Source: Economic and Business Research Center, Eller College, University of Arizona
Updated 4-30-19

Exhibit 16 shows projected yields for the RTA under the pessimistic scenario, before adjustment for inflation. Under these assumptions, RTA revenues hit \$4.121 billion during the 30-year period.

**Exhibit 16: Projected Yield for the RTA, Thousands of Nominal Dollars
Pessimistic Scenario**

	Actual				Cumulative Over Period			
	2015	2016	2017	2018	5 years 2019-2023	10 years 2019-2028	20 Years 2019-2038	30 years 2019-2048
Hotel/Motel	1,760	1,810	1,910	2,150	11,340	22,650	46,760	75,100
Communications	1,840	1,540	1,390	1,410	6,800	14,570	33,310	56,230
Contracting	6,420	4,630	5,290	7,060	44,020	95,730	226,190	392,250
Restaurant & Bar	8,460	8,810	9,220	9,560	55,460	126,470	319,370	604,260
Rental - Personal	2,110	2,040	2,120	2,350	12,760	26,640	60,140	109,320
Retail	40,630	42,180	43,490	45,350	241,870	520,470	1,239,390	2,284,450
Utilities	7,120	6,820	7,210	7,640	40,790	88,730	211,660	386,910
Other	5,490	7,210	5,850	6,270	33,160	67,430	138,690	212,730
Total	73,830	75,040	76,480	81,790	446,210	962,690	2,275,510	4,121,270

Source: Economic and Business Research Center, Eller College, University of Arizona
Updated 4-30-19

Exhibit 17 shows annual yields for the RTA under the three scenarios, before adjustment for inflation. Note that yields under the optimistic scenario exceeds the baseline immediately, driven by stronger economic growth. The pessimistic scenario revenues exceed the baseline by 2036, driven by faster projected inflation.

**Exhibit 17: Projected Yield for the RTA, Thousands of Nominal Dollars
All Scenarios, U.S. Recession Shaded**

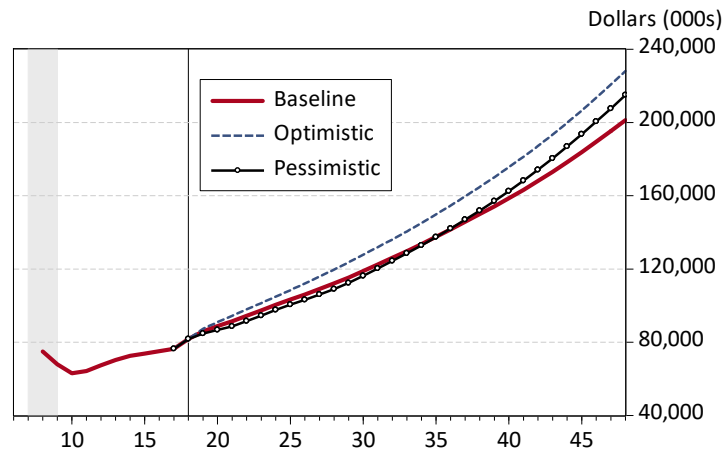


Exhibit 18 shows inflation-adjusted revenues for the RTA, for all three scenarios. Revenues under the pessimistic scenario barely increase once we account for inflation. Revenues under the optimistic scenario rise rapidly, driven by improved real economic growth, relative to the baseline. Exhibit 19 shows projected revenue growth for the RTA, after adjustment for inflation.

Exhibit 18: Projected Yield for the RTA, Thousands of 2020 Dollars
All Scenarios, U.S. Recession Shaded

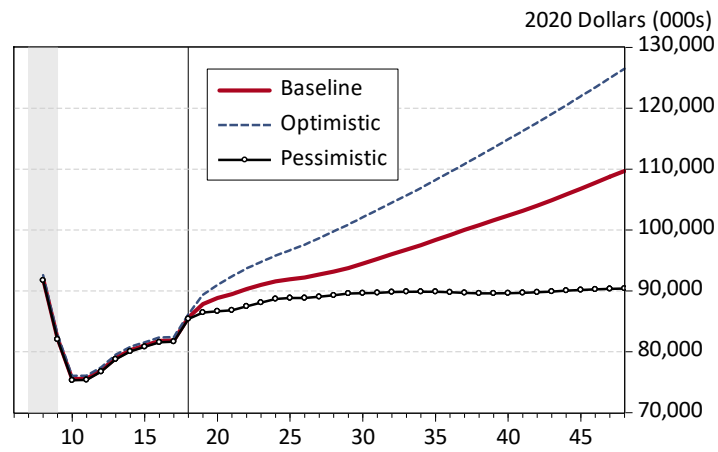
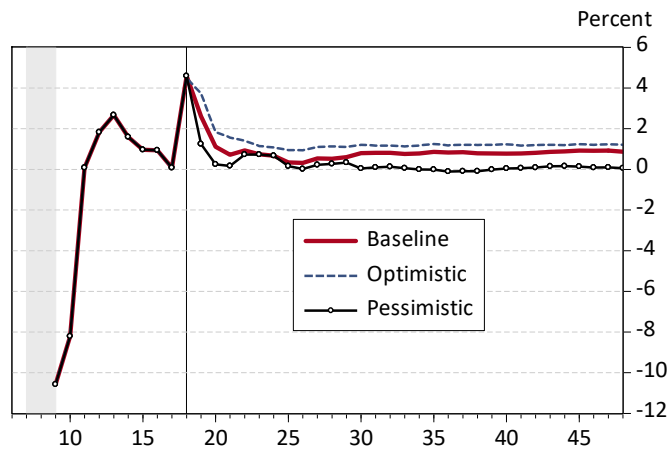


Exhibit 19: Projected Yield for the RTA, 2020 Dollars
All Scenarios, U.S. Recession Shaded



Data Used in this Study

Two sets of data on taxable sales in Pima County have been available from the Arizona Department of Revenue. The first set is the monthly data series that was available for decades, but is now becoming more difficult to get. These data are maintained by the state but obtaining this data by county, by taxable sales classification codes, e.g., retailing (classification code 17), restaurants and bars (classification code 11), etc. has become problematic. For the last two years, the Economic and Business Research Center has only been receiving data on four categories of taxable sales at the county level – retailing, hotel/motel, amusements and restaurant and bars. This set is referred to the TXS (Taxable Sales) series.

The other set of data is the revenues collected for the RTA, by category, since the RTA tax was implemented. This set of revenue data can be converted to taxable sales by dividing each category of revenues by the legislated RTA sales tax rate. For most of the categories, the sales tax rate is $\frac{1}{2}$ of one percent, so revenues can be converted to taxable sales by dividing by 0.005. For the category associated with hotel/motel sales, the tax rate is 0.0055 and for non-metal mining (stone, clay, gravel), the tax rate is 0.00312. This set of data is referred to as the RTA taxable sales series.

Although these series are similar, there are some underlying differences. First, the TXS data are disaggregated according to the legal definitions of the sales tax categories, which are based on the nature of the sale. In contrast, the RTA data series is based on the NAICS (North American Industrial Classification System) code of the business submitting the tax payments. NAICS codes are assigned to businesses based on their primary economic function, but any particular business must report more than one type of sale, based on the legal definitions of taxable sales.

A straightforward example of this might be a hotel that also operates a restaurant and a gift shop. When this hotel submits its monthly sales tax report to state and local governments, it reports sales in three different legal classifications: hotel/motel (bed) sales, classification 25; restaurant and bar sales, classification 11; and retail sales, classification 17. When these tax bases are multiplied by the relevant RTA tax rates, the resulting revenues are combined and reported to the RTA under the NAICS category of hotels/motels (specifically, accommodations, NAICS code 721). The RTA hotel/motel series would include not only room sales but also other taxable sales made by the hotel. The TXS database for hotels/motels includes only the room rental portion of hotel/motels' sales. Note that if this were the only difference, the sum of all taxable sales in the TXS dataset and the computed taxable sales in the RTA dataset would be equal. They are not identical because there are other differences, as well.

Another difference relates to the fact that the TXS data and the RTA data contain a slightly different list of taxable categories. The primary example of this is the RTA tax on real property rentals (state tax classification 13). The state tax rate on this sales classification was reduced over time and set to zero in 1996. Once the state sales tax rate was set to zero, the state no longer tracked that activity so it no longer appears in their total taxable sales figures. That category is taxed by the RTA so the revenues from this classification are included in RTA figures.

Finally, there is a difference in how/when delinquent taxes are recorded between the TXS and RTA series. If a sales tax filer is late, the TXS database is revised so the data represents when those sales occurred, not when the delinquent tax was paid. In contrast, the RTA dataset records when the taxes are paid to the RTA. Since this dataset represents tax revenue received by the RTA, they are never revised backward. A delinquent tax payment would simply be posted at the time it was deposited into the RTA account.

For modeling purposes, a fairly long time-series of data is required. The RTA revenue data series begins in July 2006, but there are almost zero revenues reported for that month. Without July, there is insufficient data to compute an annual figure for the fiscal year ending in June 2007. Therefore, the first full-year of data in the RTA dataset is FY2008. The last year is FY2016, for a total of only nine years of annual fiscal year data.

Despite these differences, the required long time-series requires us to use the TXS dataset. However, because of the lack of availability of TXS data, by county, by category, in recent years, a hybrid dataset was developed. The RTA revenue data, by category, were converted to taxable sales by dividing by the relevant RTA tax rate. Then the last three fiscal years of this constructed taxable sales data (2014-2016) were concatenated onto the longer TXS series. In other words, the longer time-series TXS data were updated in recent years using RTA data.

Model

The model described below produces forecasts of the revenues derived from the RTA's one-half percent sales tax. The model is a structural model that forecasts revenues based on Pima County's economic activity and national economic conditions. Forecasts of Pima County's economic activity were obtained from the Forecasting Project, which regularly produces forecasts for the State of Arizona, the Phoenix Metropolitan Area and the Tucson Metropolitan Area (Pima County). Forecasts of national economic activity are obtained from IHS Markit. This version of the RTA model is of annual frequency and produces forecasts of fiscal-year RTA revenue from 2019 through 2048.

In this report, we present equations designed to forecast the following sales tax categories (collection basis, fiscal year):

P_TXS_BED25CBFY = Pima County taxable sales in hotel/motel sales
P_TXS_COM5CBFY = Pima County taxable sales in communications
P_TXS_CON15CBFY = Pima County taxable sales in contracting
P_TXS_RB11CBFY = Pima County taxable sales in restaurant and bar sales
P_TXS_RE14CBFY = Pima County taxable sales in personal rentals
P_TXS_RS17CBFY = Pima County taxable sales in retail
P_TXS_UT4CBFY = Pima County taxable sales in utilities
P_RTA_RE13CBFY = Pima County RTA revenues from real commercial rentals
P_REVRESCB1FY = RTA revenues that remain after subtracting P_RTA_RE13CBFY and the sum of the multiplicands of the first seven modeled taxable sales categories times their corresponding tax rates from total RTA revenues

The tax bases taxed at ½ percent were added together:

$$P_TXS_MODELED5 = P_TXS_COM5CBFY + P_TXS_CON15CBFY + P_TXS_RB11CBFY + P_TXS_RE14CBFY + P_TXS_RS17CBFY + P_TXS_UT4CBFY$$

Then total estimated RTA revenues are as follows:

$$P_RTA_TOTCB1FY = P_TXS_MODELED5 * 0.005 + P_TXS_BED25CBFY * 0.0055 + P_RTARE13CBFY + P_REVRESCB1FY$$

This equation simply says that total RTA revenues are equal to the sum of all the modeled taxable sales that are taxable at ½ percent times 0.005, plus the hotel/motel tax base times 0.0055 plus an estimate of RTA revenues from the real property portion of the tax, plus a residual. That residual represents all of the un-modeled categories and adjusts for the timing difference between the TXS and the RTA data series. The un-modeled RTA revenue categories include transportation and towing (\$0), railroads and aircraft, private railcar/pipelines, publishing, printing, amusements, rental of real property, jet fuel tax and other. These categories combined represent approximately \$1.5 million, or 2 percent of the total in FY2016.

Variable Notation and Format of Estimated Equations

Descriptions of each of the equations are presented below. The method of estimation for each equation is Ordinary Least Squares and the time period used in estimation is provided for each equation. Some important notations:

suffix “fy” means fiscal year [if no suffix “fy,” data is calendar]

suffix “cb” means “collection basis” so

prefix “p_txs_” means “Pima County taxable sales in category..”

prefix “p_rta_” means “RTA revenues in category ... “

numbers in the p_rta_ and the p_txs_ variable names represent the taxable sales
legal classification code

log() means that the variable enters the equation as a logarithm to
allow for non-linear relationships

To understand the tables describing each estimated equation, consider the following simple linear equation:

$$\text{dependent variable} = \text{constant} + \text{coefficient1} * \text{variable 1} + \text{coefficient2} * \text{variable2}.$$

In the regression table, the dependent variable is listed at the top, the constant term is identified as the variable C, and variable1 and variable2 (and more) are listed down the left-hand column. The first column of numbers contains the estimated coefficients. The second column of numbers contains the standard errors of the coefficients, which represent the precision of the coefficient estimators. The 3rd column of numbers contain the t-statistics (the ratio of the first two columns), which measure the statistical significance of the coefficient. Generally, a coefficient with a t-statistic greater than or equal to 2 (in absolute value) is said to be “statistically

significant,” meaning the variable corresponding to that coefficient is important in explaining the variation in the variable on the left-hand side of the equation.

Among the statistics presented at the bottom of the equation, the easiest to describe is the one labeled “R-squared.” This is a “goodness-of-fit” measure that describes the portion of the variation of the left-hand variable that is explained by the right-hand side variables. An R-square of 0.95 means that the variables on the right-side of the equation explain 95 percent of the variation in the dependent variable.

When both the left- and right-hand side variables are written as logarithms (i.e., $\log(\)$), the coefficients in the equation are the estimated “elasticities.” Elasticity is a measure of the responsiveness of the left-hand side variables to changes in the right-hand side variables. An elasticity greater than 1 is said to be “elastic,” because the left-hand side variable responds in a more than proportional way to changes in the right-hand side variable. An elasticity less than 1 is “inelastic,” meaning that the left-hand variable changes less than proportionally to changes in the right-hand side variables. An elasticity of 1 is said to be “unitary” and represents a proportional response.

In some equations there is an added “variable” that appears as AR(1). This is a serial autocorrelation correction term. Often, when using time-series data, the errors from a regression are not independent from each other. Instead, consecutive errors are correlated to each other. When this occurs, the coefficients are not affected (i.e., they are not biased), but the t-statistics are inflated. The presence of autocorrelation therefore makes some variables appear statistically significant when they are not. To correct for this, some of the equations have been corrected for serial autocorrelation and this will be noted by the presence of AR(1) among the list of variables. When the AR(1) term is estimated, we also estimate the error variance, given by SIGMASQ.

Model Equations

Taxable Sales: Bed Tax (BED25)

This equation relates real hotel/motel taxable sales to U.S. consumption of accommodation services and a trend defined by U.S. population. Binary variables are included to account for a shift in the trend driven by the Great Recession. The equation explains approximately 89 percent of the variation in real hotel/motel sales. The U.S. consumption variable has the expected positive sign and is very significant in explaining variation in the dependent variable. The trend and binary variables are marginally significant, but are jointly significant at the 5 percent level.

Dependent Variable: LOG(P_TXS_BED25CBFY/CPIFY)
Method: ARMA Maximum Likelihood (BFGS)
Date: 04/14/19 Time: 14:01
Sample: 1987 2018
Included observations: 32
Convergence achieved after 7 iterations
Coefficient covariance computed using outer product of gradients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	14.64952	2.072534	7.068411	0.0000
LOG(CSVACFY/CPIFY)	0.917984	0.286314	3.206213	0.0037
1/NPFY	298.4751	401.9635	0.742543	0.4647
D_STEP_2007	-4.219192	2.416720	-1.745834	0.0931
(1/NPFY)*D_STEP_2007	1245.235	734.1187	1.696232	0.1023
AR(1)	0.831822	0.153384	5.423119	0.0000
SIGMASQ	0.002008	0.000476	4.220650	0.0003
R-squared	0.887195	Mean dependent var	18.76414	
Adjusted R-squared	0.860122	S.D. dependent var	0.135543	
S.E. of regression	0.050693	Akaike info criterion	-2.898613	
Sum squared resid	0.064245	Schwarz criterion	-2.577983	
Log likelihood	53.37781	Hannan-Quinn criter.	-2.792334	
F-statistic	32.77036	Durbin-Watson stat	1.531035	
Prob(F-statistic)	0.000000			
Inverted AR Roots	.83			

Variable Definitions:

CSVACFY is U.S. personal consumption expenditures on accommodations, fiscal year

CPIFY is the U.S. consumer price index, all areas, all items, fiscal year

NPFY is U.S. population, fiscal year

D_STEP_2007 is a binary variable set to 0.0 prior to 2007, then to 1.0 thereafter

Taxable Sales: Communications (COM5)

Taxable sales in communications are driven by a national variable reflecting household consumption of telecommunications services. This is adjusted for Pima County disposable income relative to the U.S. The equation explains 94 percent of the variable in sales with an elasticity less than one. This indicates that taxable communications sales rise at a slower pace than nationally, after adjustment for income.

Dependent Variable: LOG((P_TXS_COM5CBFY))
Method: ARMA Maximum Likelihood (BFGS)
Date: 04/15/19 Time: 15:15
Sample: 1986 2017
Included observations: 32
Convergence achieved after 6 iterations
Coefficient covariance computed using outer product of gradients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	14.50020	2.099136	6.907700	0.0000
LOG(P_YPDFY(-1)*CSVOCTFY(-1)/YP...	0.881688	0.350734	2.513839	0.0180
AR(1)	0.696822	0.112711	6.182391	0.0000
SIGMASQ	0.014260	0.003434	4.152585	0.0003
R-squared	0.937130	Mean dependent var	19.42642	
Adjusted R-squared	0.930394	S.D. dependent var	0.483869	
S.E. of regression	0.127659	Akaike info criterion	-1.141675	
Sum squared resid	0.456308	Schwarz criterion	-0.958458	
Log likelihood	22.26681	Hannan-Quinn criter.	-1.080944	
F-statistic	139.1219	Durbin-Watson stat	1.594858	
Prob(F-statistic)	0.000000			
Inverted AR Roots	.70			

Variable Definitions:

CSVOCTFY is U.S. personal consumption expenditures on telecommunications services, fiscal year

P_YPDFY is Pima County disposable income, fiscal year

YPDFY is U.S. disposable income, fiscal year

Taxable Sales: Contracting (CON15)

Taxable sales in contracting is estimated using a U.S. residential investment variable and relative Pima County to U.S. population. This equation explains over 92 percent of the variation in contracting sales. The elasticity of this variable is 0.6, which indicates that Pima County tends to lag behind the U.S. in growth, after adjustment for population size.

Dependent Variable: LOG(P_TXS_CON15CBFY)

Method: ARMA Maximum Likelihood (BFGS)

Date: 04/15/19 Time: 15:34

Sample: 1987 2017

Included observations: 31

Convergence achieved after 7 iterations

Coefficient covariance computed using outer product of gradients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	12.38780	2.419795	5.119361	0.0000
LOG((P_POPFY/NPFY)*(IFRESFY(-1)))	0.602234	0.171373	3.514178	0.0016
AR(1)	0.860745	0.134619	6.393941	0.0000
SIGMASQ	0.013142	0.003178	4.135407	0.0003
R-squared	0.922857	Mean dependent var	20.88869	
Adjusted R-squared	0.914286	S.D. dependent var	0.419569	
S.E. of regression	0.122837	Akaike info criterion	-1.192441	
Sum squared resid	0.407400	Schwarz criterion	-1.007411	
Log likelihood	22.48284	Hannan-Quinn criter.	-1.132126	
F-statistic	107.6672	Durbin-Watson stat	1.351304	
Prob(F-statistic)	0.000000			
Inverted AR Roots	.86			

IFRES is U.S. residential investment structure spending

P_POPFY is Pima County population, fiscal year

NPFY is U.S. population, fiscal year

Taxable Sales: Restaurants and Bars (RB11)

Taxable gross income from the business activity of preparing or serving food or beverage in a bar, restaurant, or similar establishment where articles of food or drink are prepared or served for consumption on or off the premises, including also the activity of catering. This category is estimated using a national measure of the same activity, adjusted to reflect local income.

Transfer payments relative to total personal income has the expected negative sign since spending from transfer payments differs from spending from income derived from other sources.

The regression explains much of the variation in taxable sales for this category. The sign on the national consumption trend is positive, while the relative transfer income share is negative, as expected. A high share of income from transfer payments reflects an economy that is dominated by retirees and/or performing below potential. In each instance, we expect a high relative share to be correlated with less restaurant and bar sales.

Dependent Variable: LOG(P_TXS_RB11CBFY)

Method: ARMA Maximum Likelihood (BFGS)

Date: 04/14/19 Time: 14:01

Sample: 1986 2017

Included observations: 32

Convergence achieved after 4 iterations

Coefficient covariance computed using outer product of gradients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	13.88113	0.229973	60.35997	0.0000
LOG(P_YPDFY/YPDFY*CSVFFY)	1.015045	0.038761	26.18736	0.0000
LOG((P_YTPFY/P_YPFY)/(YPTRFFY/Y...	-0.694040	0.216863	-3.200362	0.0035
AR(1)	0.617887	0.186998	3.304245	0.0027
SIGMASQ	0.000449	0.000149	3.023180	0.0054
R-squared	0.997601	Mean dependent var	20.68158	
Adjusted R-squared	0.997246	S.D. dependent var	0.439691	
S.E. of regression	0.023075	Akaike info criterion	-4.542496	
Sum squared resid	0.014376	Schwarz criterion	-4.313474	
Log likelihood	77.67993	Hannan-Quinn criter.	-4.466582	
F-statistic	2807.159	Durbin-Watson stat	1.278932	
Prob(F-statistic)	0.000000			
Inverted AR Roots	.62			

CSVFFY is U.S. personal consumption expenditures on food services, fiscal year

P_YPDFY is Pima County disposable income, fiscal year

YPDFY is U.S. disposable income, fiscal year

P_YTPFY is Pima County transfer income, fiscal year

P_YPFY is Pima County personal income fiscal year

YPTRFFY is U.S. transfer income, fiscal year

YPFY is U.S. personal income, fiscal year

Taxable Sales: Rentals of Personal Property (RE14)

This category of taxable sales is the gross income from persons engaged in the business of leasing, licensing for use, or renting tangible personal property. The largest component of this category is automobile leasing. The regression includes U.S. consumption spending on motor vehicle services, adjusted for relative income. Taxable sales in contracting is included to capture trends in heavy vehicle rentals by construction firms.

The set of single-year binary variables are set to zero, with a one in the year included in the variable name. Data in the time period 1998 through 2004 could not be explained with any of the logical national or county-specific variables. Rather than truncating the equation, six years of data were removed from the regression through the use of binary variables. In addition, the deepest part of the recession (2009-11) was removed using binary variables because inclusion of those years biased the elasticities of equation variables upward.

Dependent Variable: P_TXS_RE14CBFY
Method: ARMA Maximum Likelihood (BFGS)
Date: 04/14/19 Time: 14:01
Sample: 1988 2017
Included observations: 30
Convergence achieved after 5 iterations
Coefficient covariance computed using outer product of gradients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.10E+08	20705580	5.304242	0.0001
CSVTSMFY*P_YPDFY/YPDFY	341141.5	51039.26	6.683904	0.0000
P_TXS_CON15CBFY	0.052906	0.010300	5.136309	0.0001
D_SPIKE_1998	23577528	1.24E+08	0.189666	0.8520
D_SPIKE_1999	48284978	1.01E+08	0.476023	0.6405
D_SPIKE_2000	65819571	70410384	0.934799	0.3638
D_SPIKE_2001	73218366	44787328	1.634801	0.1216
D_SPIKE_2002	93088037	26061235	3.571897	0.0025
D_SPIKE_2003	81205873	12686538	6.400948	0.0000
D_SPIKE_2009	-31998193	1.01E+08	-0.316887	0.7554
D_SPIKE_2010	-27081414	72599620	-0.373024	0.7140
D_SPIKE_2011	-19876083	39111314	-0.508193	0.6183
AR(1)	0.621892	0.169785	3.662814	0.0021
SIGMASQ	1.30E+14	4.65E+13	2.797474	0.0129
R-squared	0.982587	Mean dependent var	3.47E+08	
Adjusted R-squared	0.968438	S.D. dependent var	87933643	
S.E. of regression	15621995	Akaike info criterion	36.28728	
Sum squared resid	3.90E+15	Schwarz criterion	36.94117	
Log likelihood	-530.3092	Hannan-Quinn criter.	36.49647	
F-statistic	69.44846	Durbin-Watson stat	1.596032	
Prob(F-statistic)	0.000000			
Inverted AR Roots	.62			

CSVTSMFY is U.S. personal consumption expenditures on motor vehicle services, fiscal year

P_YPDFY is Pima County disposable income, fiscal year

YPDFY is U.S. disposable income, fiscal year

P_TXS_CON15CBFY is Pima County taxable sales in contracting, collection basis, fiscal year

D_SPIKE_YYYY is a binary variable that is 1.0 in YYYY and 0.0 otherwise

Taxable Sales: Retail Sales (RS17)

Taxable sales in retail sales includes primarily the purchases of goods locally. This is by far the largest sales tax category. Even so, it is a declining share of income. One driver of the decline has been a shift in spending toward services, which are excluded from tax. Another driver is online sales, which reduce the sales of local brick and mortar businesses. A data series was derived from the U.S. Census Bureau's Annual Survey of Retail Trade. Online sales were divided by U.S. retail categories that are taxable in Arizona. A portion of the online sales would be taxed if those online purchases were from stores that have a legal nexus in the county. Specifically, online purchases from stores like Best Buy, Home Depot, Macy's would all charge state and local sales taxes as though those purchases were made locally in stores. The RTA loses online purchases from totally out-of-area businesses, e.g. LLBean, Zappos.com, etc.

The regression equation is estimated as a ratio, with taxable retail sales relative to Pima County disposable income regressed on U.S. personal consumption of goods, relative to U.S. disposable income. The online sales variable controls for the growth in non-taxable online retail sales. The trough years of 2009-11 are removed with binary variables. This equation explains approximately 98 percent of the variation in real retail sales.

Dependent Variable: P_TXS_RS17LCBFY/P_YPDFY
Method: ARMA Maximum Likelihood (BFGS)
Date: 04/14/19 Time: 14:01
Sample: 1985 2017
Included observations: 33
Convergence achieved after 7 iterations
Coefficient covariance computed using outer product of gradients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	117356.3	66381.41	1.767909	0.0893
CGOODSFY/YPDFY	616693.1	197850.4	3.116967	0.0046
ONLINESALESNEWFY	-578886.5	223686.9	-2.587932	0.0159
D_SPIKE_2009	-17834.42	9079.643	-1.964221	0.0607
D_SPIKE_2010	-16263.76	8467.658	-1.920691	0.0662
D_SPIKE_2011	-13058.79	5910.621	-2.209376	0.0365
AR(1)	0.835756	0.142374	5.870132	0.0000
SIGMASQ	35095823	9004607.	3.897541	0.0006
R-squared	0.977257	Mean dependent var	282746.6	
Adjusted R-squared	0.970888	S.D. dependent var	39891.62	
S.E. of regression	6806.356	Akaike info criterion	20.73265	
Sum squared resid	1.16E+09	Schwarz criterion	21.09544	
Log likelihood	-334.0887	Hannan-Quinn criter.	20.85472	
F-statistic	153.4597	Durbin-Watson stat	1.496080	
Prob(F-statistic)	0.000000			
Inverted AR Roots	.84			

CGOODSFY is U.S. personal consumption expenditures on goods, fiscal year

P_YPDFY is Pima County disposable income, fiscal year

YPDFY is U.S. disposable income, fiscal year

ONLINESALESNEWFY is the ratio of total retail sales (including online sales) to retail sales without online sales

D_SPIKE_YYYY is a binary variable that is 1.0 in YYYY and 0.0 otherwise

Taxable Sales: Utilities (UT4)

The equation for taxable sales in utilities uses U.S. consumption in utilities adjusted to reflect the size of Pima County's population. This equation explains almost 99% of the variation in this category. The elasticity on the adjusted U.S. consumption variable is relatively small, at 0.8, which indicates that local gains in utility sales have tended to lag behind the U.S.

Dependent Variable: LOG(P_TXS_UT4CBFY)

Method: ARMA Maximum Likelihood (BFGS)

Date: 04/14/19 Time: 14:01

Sample: 1986 2018

Included observations: 33

Convergence achieved after 4 iterations

Coefficient covariance computed using outer product of gradients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	10.03058	0.395047	25.39087	0.0000
LOG((CSVUFY/NPFY)*P_POP...	0.800102	0.029527	27.09774	0.0000
AR(1)	0.447568	0.147548	3.033373	0.0051
SIGMASQ	0.001527	0.000451	3.388476	0.0020
R-squared	0.987702	Mean dependent var	20.67107	
Adjusted R-squared	0.986430	S.D. dependent var	0.357791	
S.E. of regression	0.041679	Akaike info criterion	-3.397652	
Sum squared resid	0.050377	Schwarz criterion	-3.216257	
Log likelihood	60.06126	Hannan-Quinn criter.	-3.336618	
F-statistic	776.3895	Durbin-Watson stat	2.150703	
Prob(F-statistic)	0.000000			
Inverted AR Roots	.45			

CSVUFY IS U.S. consumer spending on utilities, fiscal year

NPFY U.S. population, fiscal year

P_POPFY = Pima County population, fiscal year

Taxable Sales: Real Rentals (Category RE13) and Other

The tax on real rentals effectively was repealed at the state level because the state tax rate on this category is set to zero. The RTA taxes this category because the enabling legislation defined the categories as what existed in the state in a year prior to the repeal. Because no TXS time series exists for real rentals, the RTA revenue data is used. However, the RTA revenue data series is still too short to obtain an adequate equation for this category so it is projected by assuming it grows with population.

After all the above modeled TXS categories of the sales tax base are multiplied by the corresponding RTA tax rate and added to collections from real rentals (P_RTA_RE13CBF), the result is subtracted from total RTA revenues. The remainder is a residual that includes several very small categories of taxable sales (listed earlier in the report) and also includes various adjustments to control for other differences between the RTA and the TXS data series. The residual P_REVRES1CBF is forecast by assumption and is assumed to grow with population growth.

Forecasting Project Third Quarter 2018 Economic Outlook



THE UNIVERSITY OF ARIZONA | ELLER COLLEGE OF MANAGEMENT

ECONOMIC *Outlook*

3RD QUARTER 2018



Arizona Cruises into the Long Run: The 30-Year Outlook

By George W. Hammond, Ph.D.
EBRC Director and Research Professor

More than nine years into the current expansion, Arizona continues to post solid growth in jobs and income. The Phoenix Metropolitan Statistical Area (MSA) remains the engine of state job gains, but Tucson is contributing as well. All major industries in Arizona added jobs during the past year, with construction employment finally firing on all cylinders. Housing permits are up, but not enough to restrain rapid house price increases. Overall, the state housing market is not in the red zone yet, but affordability will become more of a concern in the near future.

///////////////// August, 2018 \\\\\\\\\\\\\\\\\\\\\\\

In the long run, Arizona remains well positioned to outpace the nation and most states in job, income, and population growth. Tucson is likely to outpace the U.S. during the next 30 years, but fall well short of growth rates posted by Phoenix. The state's standard of living will continue to rise, even after accounting for inflation. However, Arizona will not make much progress in closing the per capita personal income gap with the nation without significant improvement in college attainment.



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ECONOMIC Outlook

Arizona Cruises into the Long Run: The 30-Year Outlook 3rd Quarter 2018 Forecast Update

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The Forecasting Project is a research group within the Economic and Business Research Center providing economic forecasts and a comprehensive examination of business conditions four times per year.

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CONTINUED FROM COVER...

Arizona Recent Developments

Arizona added jobs at a solid clip in the second quarter, with 69,500 net new jobs over the year according to preliminary estimates. That translated into 2.5% growth, slightly faster than last quarter's pace of 2.4% and well above the U.S. pace of 1.6%. As **Exhibit 1** shows, Arizona's job growth has been well above the U.S. average since late 2014.

Job gains were widespread across industries, with all major sectors adding jobs. Education and health services added the most jobs over the year, at 15,000, followed by construction (up 13,300), professional and business services (up 9,300), and manufacturing (up 8,900). Together, these four sectors alone accounted for 66.9% of net job gains over the year. Increases were more modest in information, natural resources and mining, government, and other services. Other services includes personal and repair services, membership organizations, among others not classified elsewhere.

The Phoenix MSA continues to drive state job gains. Phoenix employment increased by 60,400 jobs over the year in the second quarter, for 3.0%

growth. The Tucson MSA posted gains close to the national rate, with jobs rising by 6,200, or 1.6%.

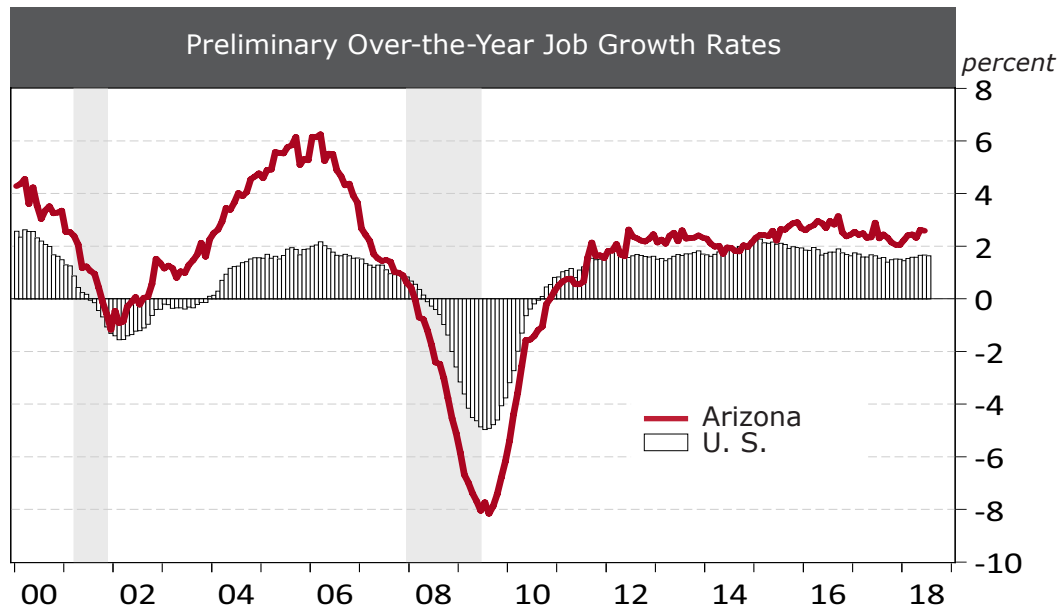
Arizona personal income rose 4.3% over the year in the first quarter of 2018, before adjustment for inflation. That comfortably outpaced national growth, at 3.6%, and the national rate of inflation of 2.3%. Arizona's income gains were supported by increases net earnings from work, up 4.5%, income from dividends, interest, and rent, up 3.2%, and transfer receipts, up 4.4%. Transfer receipts include Social Security, Medicare, Medicaid, and welfare receipts.

Overall, Arizona and national income growth has been sluggish during the recovery to date. A major factor driving slow gains has been modest wage increases. Early in the recovery that was due to slack in the labor market (high unemployment rates). However, with unemployment rates falling rapidly and near levels last seen before the Great Recession began, wages should be rising faster. That is particularly true in Arizona, with large increases in the state minimum wage beginning in 2017.

One explanation for slow growing wages in Arizona and nationally is the retirement of the baby boom

OVERALL, THE STATE HOUSING MARKET IS NOT IN THE RED ZONE YET, BUT AFFORDABILITY WILL BECOME MORE OF A CONCERN IN THE NEAR FUTURE.

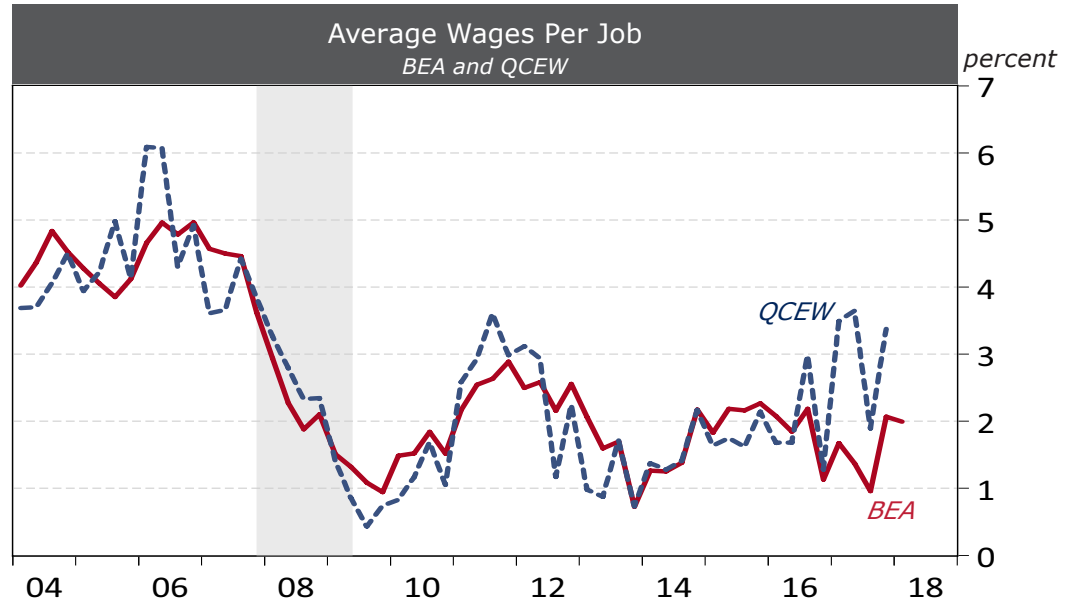
Exhibit 1: Arizona's Job Growth Remains Well Above the Nation



IN 2016, ARIZONA'S PER CAPITA DISPOSABLE INCOME WAS \$36,426, 15.6% BELOW THE U.S. AVERAGE OF \$43,148.

ARIZONA'S REAL (COST-OF-LIVING ADJUSTED) PER CAPITA DISPOSABLE INCOME WAS \$34,364 IN 2009 DOLLARS, WHICH WAS 11.8% BELOW THE NATION, AT \$38,946.

Exhibit 2: Estimates of Arizona Wage Growth Diverged in 2017



generation. As high-paid baby boomers retire, they are being replaced by less experienced (and lower paid) workers. This will put downward pressure on average measures of wage growth, like wages per job and average hourly earnings. Other factors are likely at play as well, including slow productivity growth and measurement issues.

One measurement issue to watch in the Arizona data is the growing divergence between wages per job reported by the U.S. Bureau of Economic Analysis (BEA) and the U.S. Bureau of Labor Statistics (BLS). The BEA data on wages and salaries, converted to wages per job using BLS total nonfarm employment (CES) still shows slow wage growth in 2017 (**Exhibit 2**). BEA initially estimates state wages and salaries based on econometric methods and then, ultimately, the wage data from the Quarterly Census of Employment and Wages (QCEW) published by BLS. In the long-run, these two series track fairly closely. Note that in 2017, they are diverging. The QCEW data shows the expected acceleration in 2017, while the BEA data does not. Keep in mind that the BEA data will be revised multiple times during 2018, with the next large revision in September.

Disposable income is one key measure of the resources available to residents of a state to consume or save. It is defined as personal income

minus income and property taxes. To get a sense of how these financial resources compare across states, it is common to compute a per capita measure. This tells us the amount of income available for spending and saving per resident. I use data for 2016 to analyze Arizona's per capita performance because that is the latest year for which all relevant data are available. Further, for this analysis, I use Census population estimates.

In 2016, Arizona's per capita disposable income was \$36,426, 15.6% below the U.S. average of \$43,148. That ranked Arizona 42nd out of the fifty states and the District of Columbia. Mississippi posted the lowest per capita disposable income, at \$32,567, which was 24.5% below the nation. The District of Columbia posted the highest income level, at \$64,273, which was 49.0% above the nation.

We all know that the cost-of-living differs significantly between the District of Columbia and Mississippi. Let's see how adjusting for regional differences in the cost-of-living affects state per capita disposable income, using regional price parities published by the BEA. As **Exhibit 3** shows, Arizona's real (cost-of-living adjusted) per capita disposable income was \$34,364 in 2009 dollars, which was 11.8% below the nation, at \$38,946. Arizona's ranking was 46th among

the fifty states and the District of Columbia. New Mexico had the lowest adjusted per capita disposable income in 2016, 13.2% below the nation. The District of Columbia posted the highest adjusted per capita disposable income, at 28.9% above the nation.

Adjusting for regional differences in the cost-of-living primarily serves to reduce cross-state variation in estimates of income. In more technical terms, it reduces the standard deviation from \$6,629 in nominal per capita disposable income to \$4,006 in cost-of-living adjusted per capita disposable income.

Overall, Arizona's per capita income remains well below the national average (and most states) even after we adjust for differences in income and property taxes, as well as differences in the cost-of-living.

While Arizona's per capita income is low compared to other states, it is

important to remember that a state's standard of living reflects more than the financial resources available to residents. Arizona retains a significant climate advantage that generates a higher standard of living here than we might expect based on income alone.

One big change in Arizona's labor market during the past year has been the resurgence of construction job growth, which is now rising at rates last seen in early 2006 (around 10% over the year), according to the preliminary monthly data. Likewise, statewide housing permits continue to increase at a solid pace. Through the first six months of this year, Arizona total permits were up 8.5%, compared to the same period in 2017. That reflected a 12.6% increase in single family permits. Multi-family permits were down 2.1%.

Phoenix MSA housing permits were up 12.6% through June, with gains in

Exhibit 3: Arizona Per Capita Disposable Income Ranks Low, Even After Cost-of-Living Adjustment

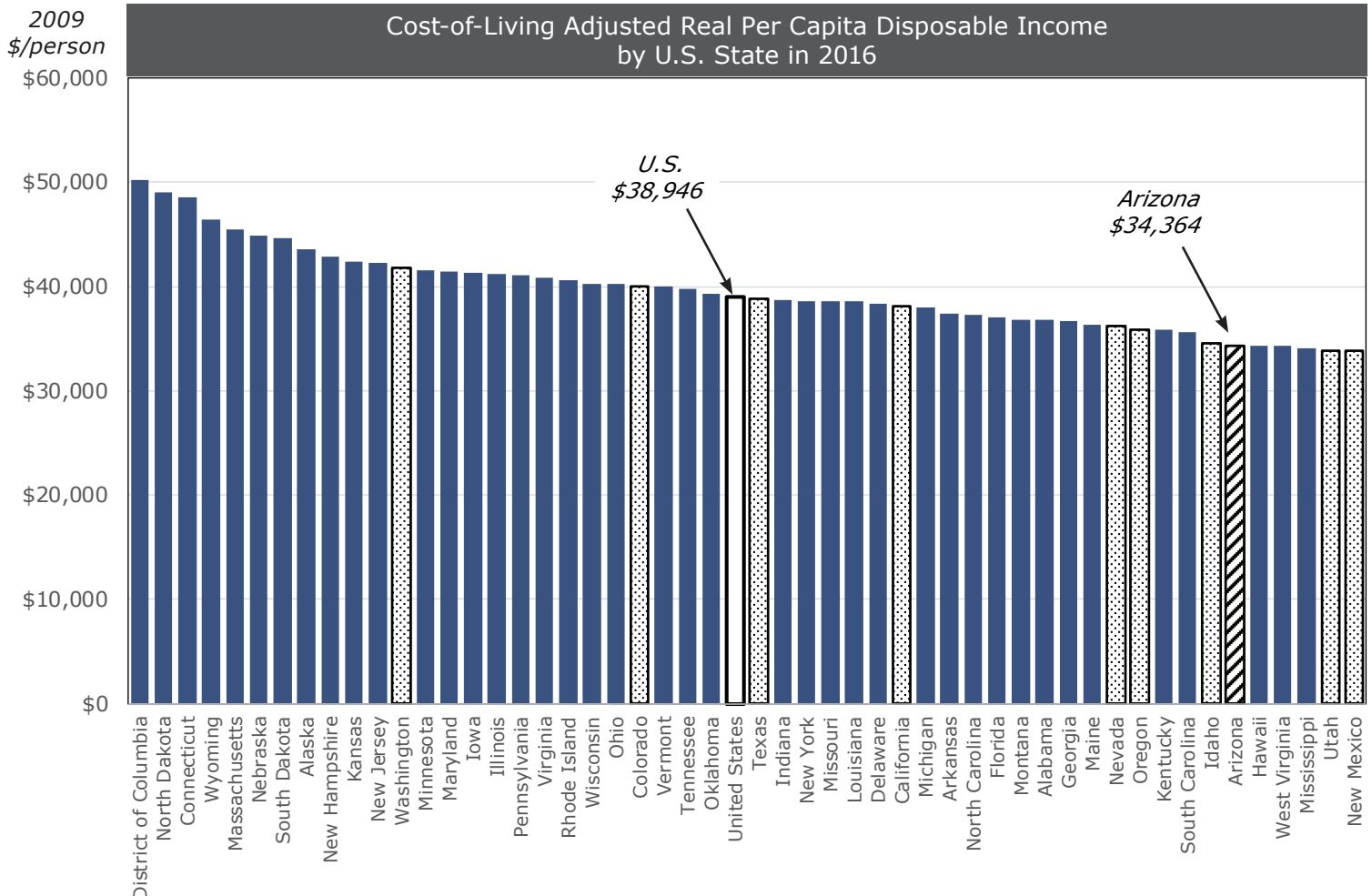
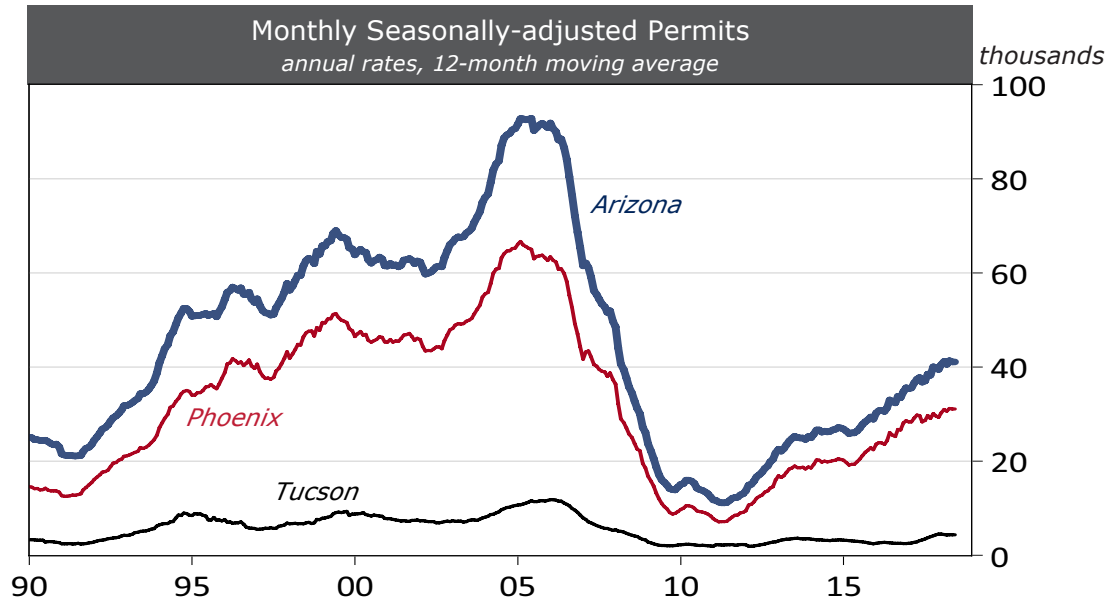


Exhibit 4: Arizona Housing Permits Are Back to a Mid-1990s Pace

PHOENIX MSA HOUSING PERMITS WERE UP 12.6% THROUGH JUNE, WITH GAINS IN BOTH SINGLE AND MULTI-FAMILY ACTIVITY. TUCSON MSA PERMITS HAVE FALLEN 6.9% SO FAR THIS YEAR...

both single- and multi-family activity. Tucson MSA permits have fallen 6.9% so far this year, driven by a decline in multi-family activity (which was extremely strong last year). Single-family permits were up strongly, increasing 19.6%.

As **Exhibit 4** shows, even with steady gains since 2010, housing permits are only back to levels last seen in the mid-1990s. The sluggish rebound in construction activity has contributed to upward pressure on house prices. According to housing data from the Federal Housing Finance Agency, which reflects repeat sales on single-family homes, Arizona prices rose 9.0% over the year in the first quarter of 2018. That was much faster than the national average of 6.6%. Phoenix MSA prices rose 9.3% during the same period, while Tucson MSA prices increased 7.9%.

Rising house prices in Arizona are putting downward pressure on housing affordability. However, for Phoenix and Tucson affordability is now back to levels last seen in the early 2000s. The state housing market is not in the red zone, but it is headed toward increasing affordability issues.

Arizona's exports to Mexico continued to decline in the most recent three-month period (April-June) compared to last year. However, the data also suggest some stabilization in exports recently. The U.S. dollar remains

elevated versus the Mexican peso, at 19.0 pesos per dollar in July. Legal northbound crossings through Arizona's border ports of entry (for pedestrians and car passengers) continued to trend upward in the first quarter, which is a hopeful sign for Mexican visitor spending in the state.

After hitting lows in early 2016, crude oil and gasoline prices have been trending up. As of June 2018, Brent crude hit \$74.41/bbl and Phoenix MSA regular gasoline hit \$3.12/gallon. Crude oil and gasoline prices are now back to levels last seen in late 2014. The recent run up in gasoline prices was fueled by slower growth in oil supply (less investment, production setbacks for some major producers), the prospect of re-imposed sanctions on Iran, combined with steady global demand growth.

Arizona Outlook in the Short-Run

The U.S. outlook calls for growth to accelerate in the near term, before returning to trend rates by about 2020. The latest IHS July 2018 forecast calls for real GDP growth to rise from 2.3% last year to 3.0% in 2018, before falling to 2.7% in 2019 and 1.7% in 2020. The near-term acceleration is partly driven by the recent federal fiscal stimulus, including personal and corporate

income tax cuts and increased federal defense and nondefense spending.

After decelerating modestly this year, real household consumption spending growth increases from 2.4% in 2018 to 2.6% in 2019. Investment spending accelerates this year as well, reflecting incentives in the new tax legislation. The forecast includes the new tariffs enacted to date. They are not large or extensive enough at this point to have a significant negative impact on the outlook.

The national labor market continues to tighten during the next two years, with the unemployment rate falling from 4.4% last year to 3.4% by 2019. It then gradually drifts up to 3.6% in 2020.

The forecast calls for inflation, measured by the CPIU, to accelerate modestly, rising from 2.1% last year to 2.6% in 2018, reflecting rising energy costs. Inflation decelerates to 2.1% in 2019 and 2.3% in 2020.

The Federal Reserve is expected to continue pushing interest rates up, with the effective federal funds rate rising from 1.0% last year to 1.8% this year, 2.8% in 2019, and 3.4% in 2020. That drives longer-term interest rates up as well, with the 30-year conventional mortgage rate rising from 4.0% last year to 5.2% by 2020. Even with rising mortgage rates, national housing starts are forecast to rise to 1.45 million by 2020, up from 1.21 million last year.

This national outlook sets the stage for stronger state growth during the next two years. As **Exhibit 5**

shows, Arizona job growth is forecast to accelerate from 2.4% last year to 2.6% in 2018 and 2.5% in 2019, before slowing to 2.2% in 2020.

Stronger job growth means the state labor market will continue to tighten, pushing wages up. The rising state minimum wage will contribute as well. Overall, that means faster income and retail sales gains during the next few years. Population growth remains solid at 1.6% per year, which contributes to continued increases in housing permits.

Arizona Outlook in the Long-Run

Exhibit 6 tracks the performance of Arizona, Phoenix, Tucson, and the U.S. across four key indicators and three time periods. The first panel summarizes average growth rates for the 30 years before the Great Recession. The second shows the impact of the Great Recession, while the third shows growth during the expansion so far.

As the first panel of the table shows, growth in Arizona, Phoenix, and Tucson was well above the national average for all four indicators: nonfarm jobs, real personal income, population, and real house prices.

As expected, the declines in jobs, income, and house prices in Arizona during the Great Recession were much steeper than for the nation (second panel). Population growth was similar to the U.S. for Arizona and Phoenix, but below average for Tucson.

THE FEDERAL RESERVE IS EXPECTED TO CONTINUE PUSHING INTEREST RATES UP, WITH THE EFFECTIVE FEDERAL FUNDS RATE RISING FROM 1.0% LAST YEAR TO 1.8% THIS YEAR, 2.8% IN 2019, AND 3.4% IN 2020.

Exhibit 5: Arizona Outlook Summary

	Actual	Forecast		
	2017	2018	2019	2020
Growth Rate				
Nonfarm Jobs	2.4	2.6	2.5	2.2
Personal Income	4.1	4.8	6.3	6.1
Retail Sales Less Food	4.0	4.0	4.5	4.7
Population**	1.5	1.6	1.6	1.6
Level				
Unempl. Rate	4.9	4.5	3.9	4.0
Housing Permits	39,472	41,738	43,268	43,426

**Method-consistent rate in 2017. Published rate was 1.9%.

ARIZONA'S POPULATION RISES FROM 7.1 MILLION IN 2018 TO 10.2 MILLION BY 2048. THAT TRANSLATES INTO AVERAGE GROWTH OF 1.2% PER YEAR, DOUBLE THE NATIONAL PACE OF 0.6% PER YEAR...

Exhibit 6: Tracking Arizona's Major Indicators

	Arizona	Phoenix MSA	Tucson MSA	U.S.
Time Period: 1977-2007				
Nonfarm Jobs	4.1	4.7	3.1	1.7
Real Personal Income	4.7	5.1	3.8	2.5
Population	3.2	3.6	2.4	1.1
Real House Prices-FHFA	2.1	2.1	2.0	1.4
Time Period: 2007-2010				
Nonfarm Jobs	-3.8	-4.1	-2.9	-1.9
Real Personal Income	-2.5	-3.4	-1.3	-0.2
Population	0.7	0.9	0.1	0.9
Real House Prices-FHFA	-15.6	-17.9	-11.8	-6.5
Time Period: 2010-2017				
Nonfarm Jobs	2.2	2.7	0.9	1.7
Real Personal Income	2.7	3.4	1.5	2.6
Population	1.2	1.5	0.6	0.7
Real House Prices-FHFA	3.5	5.0	0.4	1.4

The latest data for jobs, sales, population, house prices, and the CPIU is 2017. The latest income data available for Phoenix and Tucson is 2016.

Finally, note from the third panel that growth for Arizona and Phoenix has rebounded to above U.S. average rates during the recovery so far, while Tucson has struggled to generate growth at the national pace.

While growth in Arizona, Phoenix, and Tucson has rebounded from the downturn, it has been very slow compared to gains generated during the 30 years before the Great Recession.

The long-run outlook for the nation calls for average growth rates during the next 30 years to fall below the pace set during the previous 30 year period. Demographic pressures, principally the aging of the baby boom generation, cause the slowdown nationally and across Arizona.

Arizona job growth is forecast to average 1.4% per year during the 2018-2048 period. That is more than double the national rate of 0.6% per year, as **Exhibit 7** shows, but well below growth during the previous 30 year period of 2.3% per year. Overall, state jobs rise from 2.85 million in 2018 to 4.38 million in 2048.

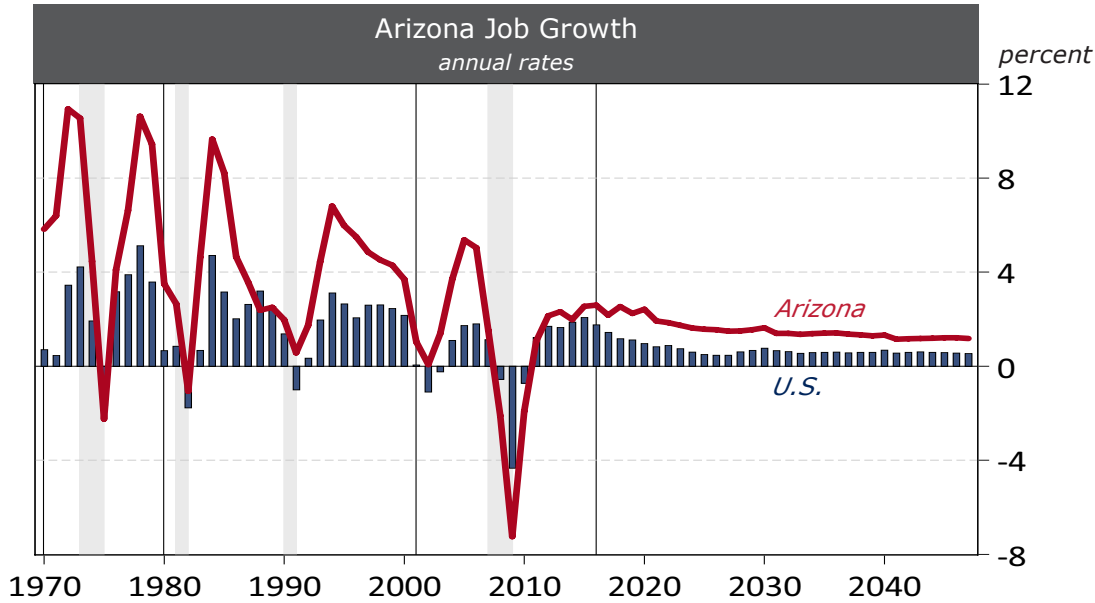
Job gains contribute to Arizona's income growth, complemented by increases in asset income (dividends,

interest, rent) and transfer receipts. Inflation-adjusted personal income rises at an average pace of 2.9% per year during the forecast, above the national pace of 2.2% per year, but again below the pace set during the three previous decades (3.2% per year).

Arizona's population rises from 7.1 million in 2018 to 10.2 million by 2048. That translates into average growth of 1.2% per year, double the national pace of 0.6% per year, but well below average growth during the previous 30 years (2.4% per year). The deceleration in population growth is driven by demographic aging, which puts downward pressure on natural increase (births minus deaths).

On a per capita basis, real personal income continues to rise at a solid pace during the next 30 years at 1.7% per year. That is slightly above the national pace of 1.6% per year. Another way to express Arizona's growth relative to the U.S. is to compute the per capita income gap. **Exhibit 8** shows the percentage difference between Arizona and U.S. per capita personal income from 1970 to 2048.

Exhibit 7: Arizona Job Growth Outpaces the Nation in the Long Run



Arizona has fallen far behind the U.S. during the past 30 years, with the gap rising from the 4.0% range during the early 1970s to the 16.0%-17.0% range recently. The forecast suggests that we may see stabilization and even some small improvement during the next 30 years, with the gap descending to around 14.0% by 2048. Even so, that is still a large difference and it is unlikely that Arizona will significantly close the income gap without major improvements in the college attainment rate relative to the nation.

As **Exhibit 9** shows, the evolution of job growth is similar for the Phoenix and Tucson metropolitan areas during the next 30 years, but Phoenix far outpaces Tucson by a substantial margin. Overall, Phoenix job growth is forecast to average 1.6% per year during the next 30 years, with the metropolitan area adding 1.3 million jobs. Tucson job growth is forecast to be positive, but slower, at 0.9% per year. Tucson jobs rise from 383,000 in 2018 to 504,000 by 2048.

Exhibit 8: Arizona Makes A Little Progress in Closing the Income Gap

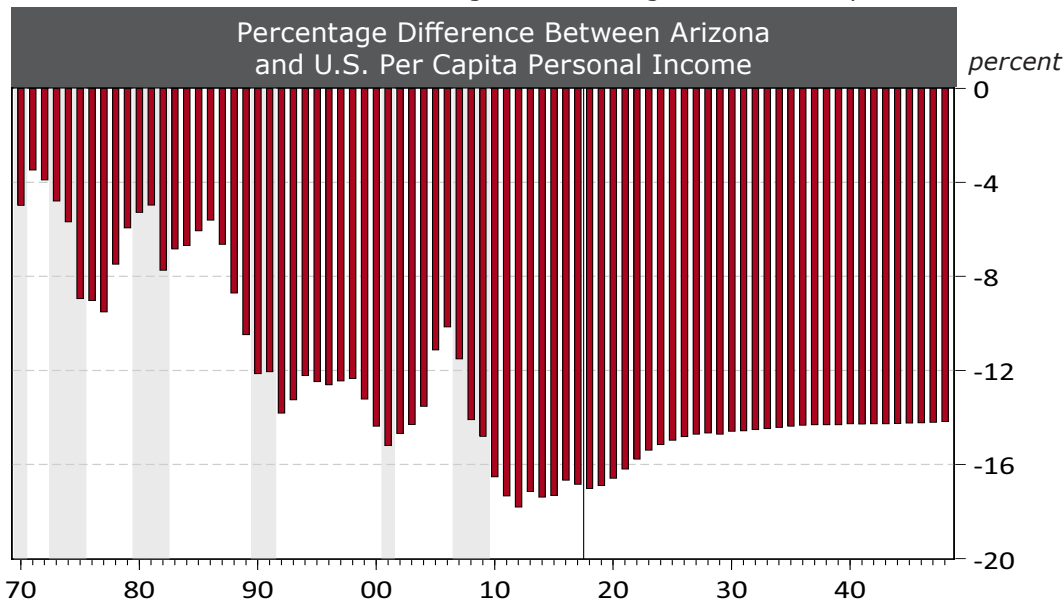
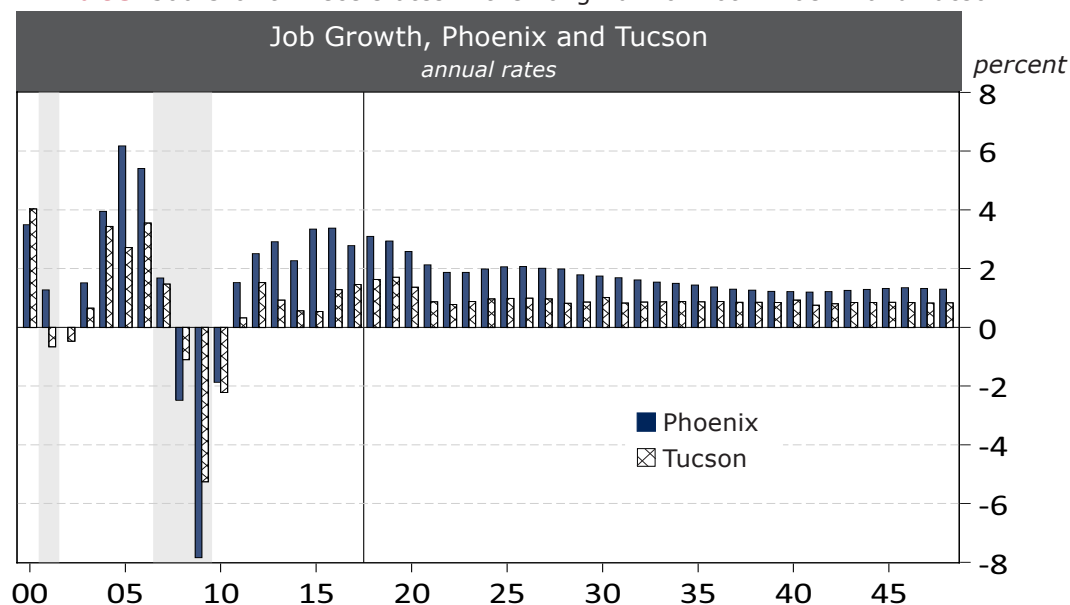


Exhibit 9: Job Growth Decelerates in the Long Run for Both Phoenix and Tucson

The Phoenix MSA is forecast to account for the bulk of state population gains (80.6%) during the next 30 years, adding 2.5 million new residents by 2048. That translates into average annual growth of 1.4% per year. Tucson's population is forecast to rise by 232,000 residents from 2018 to 2048, or by 0.7% per year.

Risks to the Outlook

The baseline outlook calls for the national economy to continue to grow in both the near and long-term. One alternative scenario is that the U.S. economy falls into recession in mid-2020, perhaps caused by an overheating economy in 2019. This might occur if the recent fiscal stimulus, at a time of relatively tight labor markets, generates more inflation than expected under the baseline. That would force the Federal Reserve to raise interest rates more than expected, pushing the nation into recession. A national downturn would significantly reduce, or eliminate, Arizona's growth.

Another alternative scenario might be that the nation is capable of even faster growth than expected under baseline assumptions. This might happen if there is more slack in labor markets than presently assumed and if productivity growth accelerates more than expected in the near term.

That would give the Federal Reserve more room to let the economy run without stepping in to restrain inflation. Under this, more optimistic, scenario Arizona grows faster than in the baseline forecast.

Risks to the long-run projections have less to do with business cycle factors, like monetary policy, and more to do with supply-side factors, like demographics, educational attainment, infrastructure, and resource constraints more generally. Demographics will slow growth in the long run, because the retirement of the baby boom generation will reduce labor force growth. Similarly, Arizona's middling college attainment rates, if they do not improve, will limit the state's economic competitiveness. It will pinch the state's ability to generate the kinds of high-skill jobs that will garner above average wages. Further, infrastructure will matter for the state's future growth. Key investments in highways and roads, water and sewer, air transport, telecommunications, and border ports will be necessary. Finally, natural resources, principally water, will need to be carefully monitored and managed to accommodate future growth.

Model Notes

This quarter's updated forecasts extend through 2048. The projections

are based on IHS Markit's July 2018 short-term forecast and March 2018 long-term forecast. The forecasts include baseline (65% probability), pessimistic (20% probability), and optimistic (15% probability) scenarios.

The statewide employment forecasts begin in the third quarter of 2018. For population, we are using estimates from the state demographer through the second quarter of 2017. Estimated data include personal income from the second quarter of 2018.

Note that in the model and forecast, we use the population estimates published by the Arizona Office of Economic Opportunity. This allows us to use the current best estimate for the population level in 2017.

The regression samples have been adjusted, where necessary, to ensure that the discontinuity does not cause the model to overestimate growth going forward.

All measures in the Arizona model are seasonally adjusted, unless otherwise noted.

NOTE: these forecasts use raw CES employment estimates from the U.S. Bureau of Labor Statistics and the Arizona Office of Economic Opportunity.

The models incorporate "add factors" reflecting announcements that we feel our equations will not capture. The adjustments incorporate large announcements affecting employment, primarily in export-base sectors.

Statewide, we're directly adjusting employment upward by 12,535 by the end of 2018, 22,232 by the end of 2019, and 28,966 by the end of 2020.

In the Tucson metropolitan area, the employment forecast was adjusted up by 2,295 by the end of 2018, 6,155 by the end of 2019, and 8,005 by the end of 2020.

Phoenix-area employment addfactors total of 10,240 by the end of 2018, 16,077 by the end of 2019, and 20,961 by the end of 2020.

Data Delivery

Check out our redesigned Forecast Project website! You can now access an expanded list of key indicators in real time by clicking on a series title to view the data and/or a graph

of the series. We are employing a cloud-based database that is updated automatically upon release by the issuing agency. When you click, the data is retrieved and displayed from our "sand-box-in-the-sky." So, the data is always up-to-date! Look for more new features to come.

Forecasting Project Sponsors may access our forecast databases via the Forecasting Project's private website two to three weeks before the quarterly update meeting. Both Eviews workfiles and spreadsheets (Excel workbooks) are available. To access the website, users need to enter a username and password. Please call if you need assistance. The website is available at <http://forecast.eller.arizona.edu>

In addition to data downloading, you can access documents and PowerPoint files, and review schedules for data release dates and our forecasting calendar. Our quarterly report, Economic Outlook, is available in PDF format for ease of printing. You'll find a contact database with phone and fax numbers, email addresses, and postal addresses for all Forecasting Project Sponsors. If you have a new title or address, let us know! A data release calendar shows when important data such as employment and personal income are to be released.

As always, please contact us immediately if you encounter any problems with access.

George Hammond (520-626-1679)
ghammond@eller.arizona.edu

Report Organization

Data tables are organized by geographic area. Tables S.1-S.2 summarize the national forecast. Tables containing historical and current estimates, as well as forecast details for Arizona are labeled A.1-A.8. Phoenix-Mesa-Glendale MSA data are found in Tables M.1-M.8, and Tucson MSA data are found in Tables P.1-P.8. You may browse important indicator and forecast series graphs in Figures 1-26, organized by geography and topic.

In the NEWS

This section contains items we have found in Arizona news web sites and economic development releases where job figures are cited. While this list is not a complete description of activity during the last quarter, it does provide insight into current developments that affect Arizona's employment base.

Tech consulting firm **Lev** (formerly called Levementum) is adding 60 employees by the end of the year, 20 of which will be in Chandler. A much larger company that also offers software and consulting to health care providers acquired Chandler firm **CloudMed Solutions** this summer. The purchase will allow CloudMed to double in size, adding 50 Chandler employees within a year. **Dexcom**, a manufacturer of continuous glucose monitoring systems, opened a plant in Mesa in 2017 and has had so much demand for the product that they are adding another 300 employees in the next six months. **Integrated Inc.** raised \$23 million in growth capital this summer for its cloud marketing business and plans to use that to add 50 employees to their Phoenix headquarters. **Humana** hired 80 people for its Phoenix call center in May. Fleet management software company **GPS Insight LLC** secured its first private equity investment this year and will use the money to invest in materials for the company and boost employment in Scottsdale by 30 people by the end of the year. **Axon Enterprises** (formerly Taser International Inc.) plans to add 50 people in Scottsdale across all departments by the end of the year, including 10 software developers. Scottsdale-based **Centauri Health Solutions Inc.** intends to hire about 200 employees by the end of the year after recently buying out a local hospital-billing firm. **JDA Software Group** is adding 100 positions at its Scottsdale headquarters. **Turo Inc.** plans to increase the Scottsdale office by 70-80 employees before the end of the year with a goal of having over 300 employees by 2020. **Silicon Valley Bank** announced in July that they were adding more than 100 positions in the Tempe office. **Freedom Financial Network** hired 1,000 people last year and intends to add another 1,000 this year in Tempe. **Movement Mortgage** plans to hire 200 in Tempe over the next 18 months despite laying off 26 employees in May.

Hash Kitchen opened a third location in July. The Chandler restaurant will employ about 150. Tucson-based **Canyon Building & Design** is expanding into the Valley, building an office in Chandler that will be finished by October and house four employees to begin with. Consulting firm **Deloitte** is opening an operations center in Gilbert that will bring 2,500 jobs. The company opened a temporary facility this summer until a permanent campus is built. Springstone Inc. will be breaking ground in the next few months on a behavioral health facility in Gilbert call **Copper Springs East Behavioral Health Hospital**. The plan is for the hospital to be complete by 2019 and employ 220. **Prenexus Health** moved its headquarters and manufacturing plant to Gilbert. They produce products from organic sugar cane and plan to have 45-50 employees within the next few years. Satellite firm **AQST** moved its headquarters from Puerto Rico to Mesa this year and plans to have 125 employees here over the next three years and 600 within six years. **Footprints to Recovery** opened a treatment facility for additions in Mesa in early May with 37 employees. **Amazon** moved a team of dispatch workers that support delivery drivers to Phoenix, bringing 130 jobs. Tech services firm **Milestone Technologies** is expanding in Phoenix, adding 100 jobs in the next nine months. The owner of **Zookz Sandwiches** opened a second location in downtown Phoenix during July and expects to have about 8-12

In the NEWS

employees. A restaurant called **The Larry** opened during July in the Phoenix warehouse district, employing 30. Angels Trumpet Ale House opened another location in August, this one called **Angel Trumpet Arcadia**. They will have 75 employees. Fox Restaurant Concepts opened another **Flower Child** restaurant in north Phoenix, employing about 80. **Lou Malnauti's Pizzeria** is opening in Scottsdale in mid-September, employing about 150. This will be the second Valley location. A new 90-bed behavioral health hospital in Surprise called **Destiny Springs Healthcare** will have about 250 employees by the time they are at 80 percent capacity. The facility is currently under construction with no timeline on opening.

A virtual call center company called **Liveops Inc.**, which considers itself the "Uber of call centers", is hiring 40 full-time people for its Scottsdale headquarters. The company also intends to add 250 part-time independent contractors in Arizona to handle call center work. **Bevy**, a software spinoff of Startup Grind that does event management, plans to double its workforce of 15 by the end of the summer. Despite laying off 300 workers on the self-driving operations, **Uber** plans to hire 70 mostly Phoenix area employees in Arizona by the end of the year to work in customer support. Staffing agency **Aerotek** has a much higher demand than it has had in a number of years, and as a result, hosted a job fair in July hoping to fill more than 800 positions in the Phoenix area.

Hawthorne Gardening closed three locations in Chandler, laying off 76 people. Construction firm **CORE West Inc.** relocated its headquarters from Phoenix to Frisco, Texas resulting in a loss of 97 jobs. A WARN listing in June indicated 85 people laid off for **AT&T** in Phoenix but there was no other information available (no news stories). **Direct Energy** cut 195 jobs at its Tempe operations center after deciding to pull out of residential solar installation work. **Safeway** closed two stores in the Valley at the end of July, letting go of 116 workers between the two. **IKEA** scrapped plans for a new store in Glendale. There was a report at the end of last year they would open a store there and employ 300 but the company opted against it.

Northwest Healthcare is building a hospital in Sahuarita that will open in late 2019 and employ 150. **Dairy Queen** is reopening in Sahuarita after being vacant for a number of years. The new owner plans to employ about 20. **C3/CustomerContactChannels** hosted a job fair in May to hire more than 1,800 full-time call center employees in Tucson, after opening new offices in April. **Fry's** is moving and expanding one of its Tucson stores. The expanded Fry's Marketplace will have about 40 more employees than their typical store. Watermark Retirement Communities is building another facility in Tucson. **Hacienda at the Canyon** is expected to open by March 2019 and our best guess on employment based on available reports is 400. Last quarter, we mentioned an un-named company was building a warehouse at the Port of Tucson that could bring as many as 1,500. We now know that this is **Amazon**, as the formal announcement took place after the last quarter's report went to print.

Albertsons closed the store on 22nd Street and Wilmot in Tucson at the end of July, affecting 54 employees. WARN notices indicated that the **Schletter Inc.** facility in Tucson let go of 16 employees. The U.S. division of the manufacturer of solar mounting systems had filed Chapter 11 in April.

In the NEWS

continued...

Vinyl Visions takes scrap vinyl and reprocesses it into PVC. The company relocated from California to Prescott, hired 50 workers, and plan to add another 50 in the next few years to take advantage of the number of manufacturers in the area that have leftover PVC from their work. Canadian firm **Arizona Mining Inc.** proposed a zinc and lead mine near Patagonia in Santa Cruz County that would provide an average of 451 jobs over a 32-year lifespan of the mine. They hope to start production by 2020, though there is a fair amount of local opposition for the mine.

Uber let go of 300 Arizona workers when it decided to shut down self-driving car tests in the state. **Interagency Council**, a social services agency in Lake Havasu City, let go of 15 in June.

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TABLE S.1

IHS MARKIT FORECASTS FOR THE UNITED STATES

	2017	2018	2019	2020	2021	2022	2023	2024
<i>Real GDP and Components (Billions of Chained 2009 Dollars)</i>								
GDP	17,096.2	17,615.4	18,082.6	18,388.0	18,650.2	18,963.0	19,310.6	19,685.3
% change	2.3	3.0	2.7	1.7	1.4	1.7	1.8	1.9
Final Sales	17,062.0	17,547.4	17,979.5	18,303.9	18,581.5	18,893.8	19,236.5	19,604.9
% change	2.4	2.8	2.5	1.8	1.5	1.7	1.8	1.9
Personal Consumption Expenditures	11,890.7	12,176.5	12,488.4	12,794.2	13,098.7	13,405.8	13,709.9	13,982.6
% change	2.8	2.4	2.6	2.4	2.4	2.3	2.3	2.0
Business Fixed Investment	2,314.2	2,468.4	2,604.7	2,706.5	2,784.2	2,856.0	2,923.0	2,990.9
% change	4.7	6.7	5.5	3.9	2.9	2.6	2.3	2.3
Residential Fixed Investment	597.9	605.2	621.0	638.3	647.3	654.6	658.3	664.3
% change	1.8	1.2	2.6	2.8	1.4	1.1	0.6	0.9
Government Purchases	2,903.3	2,961.3	3,029.4	3,056.4	3,065.0	3,068.6	3,056.4	3,053.8
% change	0.1	2.0	2.3	0.9	0.3	0.1	-0.4	-0.1
Change in Business Inventories	15.2	47.1	81.5	61.5	45.0	45.1	49.8	56.0
% change	-54.5	210.3	72.9	-24.6	-26.8	0.2	10.6	12.3
Exports	2,191.4	2,302.4	2,434.1	2,571.9	2,655.4	2,753.5	2,868.4	2,994.5
% change	3.4	5.1	5.7	5.7	3.2	3.7	4.2	4.4
Imports	2,813.2	2,937.5	3,175.6	3,461.7	3,688.1	3,878.3	4,015.1	4,109.7
% change	4.0	4.4	8.1	9.0	6.5	5.2	3.5	2.4
<i>Production, Employment and Income</i>								
Industrial Production (2007=100)	103.7	107.4	110.4	112.1	113.3	114.5	115.9	117.6
% change	1.6	3.5	2.9	1.5	1.1	1.0	1.3	1.5
Capacity Utilization, Mfg. %	74.8	75.7	75.9	74.7	73.3	72.6	72.5	72.7
Compensation, Hourly after Tax (1996 Dollars)	18.61	18.64	18.91	19.29	19.69	20.09	20.47	20.85
% change	-0.4	0.1	1.5	2.0	2.1	2.0	1.9	1.8
Personal Income (Current Dollars, Billions)	16,429.1	17,111.4	18,009.1	18,871.8	19,679.5	20,536.6	21,463.5	22,439.7
% change	3.1	4.2	5.2	4.8	4.3	4.4	4.5	4.5
Nonfarm Payroll Employment (Millions)	146.6	149.0	151.0	152.2	152.6	152.9	153.3	154.0
% change	1.6	1.6	1.4	0.8	0.2	0.2	0.3	0.5
Unemployment Rate, %	4.3	3.8	3.4	3.6	4.0	4.3	4.5	4.5
<i>Financial Markets and Inflation</i>								
10-Yr. Treasury Note Yield, %	2.3	2.9	3.3	3.5	3.6	3.6	3.5	3.5
Federal Funds Rate, %	1.00	1.83	2.82	3.38	3.43	3.44	3.31	3.06
Yield on AAA Corporate Bonds, %	3.7	3.9	4.2	4.4	4.5	4.6	4.6	4.6
GDP Deflator (Chained, 2009=100)	113.4	116.0	119.0	122.3	125.4	128.5	131.5	134.5
% change	1.8	2.2	2.7	2.7	2.6	2.4	2.3	2.3
CPI, All Urban (1982-84=100)	245.1	251.5	256.7	262.6	268.4	274.7	281.4	288.4
% change	2.1	2.6	2.1	2.3	2.2	2.3	2.4	2.5
Nom. Exch. Rate Index, US\$ vs Major Trd. Partners	1.17	1.14	1.18	1.16	1.14	1.11	1.08	1.05
% change	-0.6	-2.7	3.5	-1.4	-2.3	-2.4	-2.5	-2.5
S&P 500 Common Stock Index	2,448.0	2,729.0	2,771.0	2,785.0	2,778.0	2,818.0	2,903.0	2,986.0
% change	17.0	11.5	1.6	0.5	-0.3	1.4	3.0	2.8
<i>Other Measures</i>								
Federal Surplus or Deficit (\$ Bil)	-664.4	-921.2	-1,028.8	-1,119.7	-1,200.7	-1,278.5	-1,342.0	-1,414.9
% change	-4.7	38.6	11.7	8.8	7.2	6.5	5.0	5.4
Housing Starts (Mil Units)	1.2	1.3	1.4	1.5	1.5	1.5	1.4	1.4
% change	2.6	10.0	4.9	3.8	0.3	0.1	-0.8	-0.5
Single Unit	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.0
% change	8.5	6.8	6.4	4.5	0.4	0.2	-0.8	-0.5
Multi Unit	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
% change	-9.2	17.7	1.4	2.0	0.1	0.1	-0.9	-0.5
Sales, Existing Homes (Mil Units)	5.5	5.5	5.8	5.8	5.9	5.9	6.0	6.0
% change	1.9	-0.2	4.0	1.6	0.4	0.8	0.8	0.9
New Car Sales (Mil Units)	6.1	5.2	5.4	5.3	5.2	5.2	5.4	5.5
% change	-11.3	-14.3	2.5	-1.5	-0.6	0.0	2.4	2.7
Domestic	4.6	4.0	4.1	4.0	4.0	4.0	4.1	4.1
% change	-10.4	-14.2	3.1	-1.2	-0.6	0.0	1.3	1.8
Imports	1.5	1.3	1.3	1.2	1.2	1.2	1.3	1.4
% change	-14.1	-14.6	0.3	-2.7	-0.7	0.1	5.9	5.6
Consumer Sentiment, U. of Mich.	96.8	98.7	99.4	98.0	97.3	97.1	96.7	96.2
% change	5.4	2.0	0.7	-1.4	-0.7	-0.2	-0.4	-0.5

TABLE S.2
ALTERNATIVE SCENARIOS, U.S. (IHS MARKIT'S HIGH, BASE AND LOW)

	2017	2018	2019	2020	2021	2022	2023	2024
Real GDP	<i>Percent Change</i>							
High	2.3	3.4	4.3	2.8	2.0	2.1	2.4	2.5
Base	2.3	3.0	2.7	1.7	1.4	1.7	1.8	1.9
Low	2.3	2.9	1.4	0.4	1.9	1.5	1.6	1.8
Industrial Production								
High	1.6	4.1	4.4	2.2	1.3	1.2	1.6	1.9
Base	1.6	3.5	2.9	1.5	1.1	1.0	1.3	1.5
Low	1.6	3.2	1.5	0.6	1.7	0.9	1.0	1.4
Personal Income								
High	3.1	4.2	6.3	6.0	5.0	4.7	5.0	5.1
Base	3.1	4.2	5.2	4.8	4.3	4.4	4.5	4.5
Low	3.1	4.1	4.1	3.0	4.6	4.5	4.5	4.8
CPI, All Urban								
High	2.1	2.9	2.4	2.3	2.1	2.3	2.4	2.4
Base	2.1	2.6	2.1	2.3	2.2	2.3	2.4	2.5
Low	2.1	2.6	1.9	2.1	2.3	2.5	2.6	2.7
Housing Starts								
High	2.6	13.5	12.9	7.8	0.8	-0.5	0.0	0.4
Base	2.6	10.0	4.9	3.8	0.3	0.1	-0.8	-0.5
Low	2.6	9.9	-11.7	-1.4	9.6	7.2	-0.4	-1.5
Unemployment Rate								
High	4.3	3.8	3.2	3.2	3.5	3.9	4.0	3.8
Base	4.3	3.8	3.4	3.6	4.0	4.3	4.5	4.5
Low	4.3	3.8	4.2	5.0	4.9	5.1	5.2	5.2
T-Bond Rate, 30 Year								
High	2.9	3.3	4.0	4.4	4.7	4.7	4.7	4.8
Base	2.9	3.0	3.4	3.7	3.8	3.8	3.8	3.8
Low	2.9	2.9	2.3	2.1	2.8	3.4	3.8	4.0

TABLE A.1
FORECAST COMPARISON, ARIZONA CURRENT (18Q3) VS. PRIOR (18Q2)

	2017	2018	2019	2020	2021	2022	2023	2024
Personal Income		<i>Percent Change</i>						
Current	4.1	4.8	6.3	6.1	5.7	5.8	5.9	5.7
Prior	4.3	5.2	6.3	6.1	5.8	5.5	5.7	5.4
Difference	-0.1	-0.4	0.1	0.0	-0.1	0.3	0.2	0.3
Population								
Current	1.9	1.6	1.6	1.6	1.6	1.6	1.5	1.5
Prior	1.9	1.6	1.6	1.6	1.6	1.6	1.5	1.5
Difference	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0
Nonfarm Employment								
Current	2.4	2.6	2.5	2.2	1.8	1.8	1.8	1.7
Prior	2.4	2.5	2.6	2.3	1.9	1.8	1.7	1.7
Difference	0.0	0.1	-0.1	0.0	-0.1	0.0	0.1	0.0
Manufacturing Employment								
Current	2.6	4.6	2.4	0.7	-0.2	-0.1	0.1	0.3
Prior	2.6	3.5	1.8	1.1	0.1	0.0	0.3	0.4
Difference	0.0	1.2	0.7	-0.4	-0.4	-0.2	-0.2	-0.2
Construction Employment								
Current	7.4	7.7	2.3	0.8	0.0	-0.1	0.0	0.1
Prior	7.4	6.3	2.2	0.6	0.1	-0.2	-0.1	-0.1
Difference	0.0	1.4	0.1	0.3	-0.1	0.0	0.0	0.2
Housing Permits								
Current	10.9	5.7	3.7	0.4	0.1	0.3	-0.1	-0.3
Prior	6.8	11.8	0.9	0.5	0.4	0.3	0.2	0.3
Difference	4.2	-6.0	2.8	-0.1	-0.3	0.0	-0.3	-0.5
Retail Sales								
Current	5.4	5.0	4.6	4.6	4.1	4.2	4.5	4.5
Prior	5.4	3.7	3.7	5.7	4.5	4.1	4.3	4.3
Difference	0.0	1.3	0.9	-1.1	-0.4	0.1	0.2	0.1
Avg. Earnings								
Current	2.1	2.8	3.2	3.6	3.6	3.7	3.7	3.7
Prior	2.3	3.2	3.2	3.4	3.5	3.5	3.6	3.6
Difference	-0.2	-0.4	0.0	0.2	0.2	0.3	0.1	0.1

*Some numbers may not add due to rounding.

TABLE A.2

CURRENT ECONOMIC INDICATORS, ARIZONA

% change versus year ago for:

	FEB	MAR	APR	MAY	JUN	most	most
	2018	2018	2018	2018	2018	recent mo.	recent 12-mo.
Civilian Labor Force (000s) BLS	3,390.3	3,393.2	3,373.5	3,363.9	3,365.8	1.8	2.6
Employment	3,223.2	3,237.9	3,226.1	3,231.2	3,202.8	2.0	3.1
Unemployment	167.1	155.4	147.4	132.7	163.0	-2.8	-5.3
Unemployment Rate, Seas. Adj. (%)	4.9	4.9	4.9	4.7	4.7	-2.1	-7.2
Employees on Nonfarm Payrolls (000s) BLS, EBRC Benchmark							
Total Nonfarm	2,825.8	2,837.9	2,844.5	2,839.1	2,794.2	2.6	2.3
Natural Resources and Mining	11.6	11.8	11.9	12.0	11.9	0.8	2.9
Construction	150.7	152.1	154.4	156.8	161.3	10.0	8.6
Durable Goods Manufacturing	127.8	128.0	128.2	129.6	131.4	6.2	4.5
Fabricated Metal Products	19.7	19.7	19.7	19.9	20.0	2.6	1.2
Computer and Electronic Products	33.3	33.5	33.6	33.9	34.4	9.9	6.3
Aerospace Products and Parts	27.2	27.3	27.3	27.5	28.4	6.8	3.7
Non-Durable Goods Manufacturing	41.6	42.1	41.7	42.1	41.8	3.2	4.6
Wholesale Trade	94.9	96.7	95.4	95.1	95.4	-0.1	0.5
Retail Trade	333.2	332.9	332.1	333.0	332.0	1.2	1.0
Utilities	12.2	12.2	12.2	12.2	12.3	0.0	-0.3
Transportation and Warehousing	86.9	88.0	87.6	88.4	88.8	5.0	3.8
Information	45.3	45.2	45.6	46.3	46.6	1.5	0.2
Finance and Insurance	166.3	165.6	165.5	165.9	165.7	1.5	3.8
Real Estate, Rental, and Leasing	52.2	52.6	52.4	51.6	52.3	4.0	2.3
Professional and Business Services	424.8	426.1	427.2	425.4	427.3	2.5	1.7
Educational Services	69.1	68.3	68.7	66.6	60.1	9.1	7.9
Health Care and Social Assistance	369.7	371.5	372.0	373.2	373.9	2.7	2.4
Leisure and Hospitality	324.9	331.3	334.1	332.2	326.2	2.8	2.7
Other Services	88.4	89.0	89.1	90.9	89.5	0.2	0.4
Federal Government	54.6	54.7	55.1	55.5	55.8	-0.9	-0.2
State and Local Government	371.6	369.8	371.3	362.3	321.9	-0.1	0.3
State and Local Education	206.1	204.8	205.7	195.3	153.4	0.6	0.2
Hours Worked Per Week, Mfg. BLS	38.9	39.3	40.3	39.7	41.1	1.7	1.7
Average Hourly Earnings (\$)BLS							
Construction	22.7	22.8	22.8	22.6	23.0	6.0	2.1
Manufacturing	18.5	18.8	19.1	19.4	19.9	13.7	4.6
Retail Trade	14.6	14.8	15.1	15.3	15.3	4.1	-0.8
Wholesale Trade	28.7	27.2	27.9	26.6	26.0	-6.1	7.8
Sales (\$000s) ADOR							
Aggregate Retail Sales	8,323,913	9,618,956	8,755,157	9,060,502		7.0	5.2
Retail Less Food	5,330,516	6,373,787	5,569,584	5,892,787		6.0	5.5
Food, EBRC	1,174,539	1,176,321	1,179,411	1,170,808	1,155,239	3.8	3.7
Restaurants & Bars	1,274,712	1,436,791	1,327,704	1,245,340		2.7	5.7
Gasoline, EBRC	544,146	632,058	678,458	751,567		31.5	4.5
Gallons (000s) ADOT	231,552	266,804	251,095	256,595		1.1	-5.8
Utilities	688,587	693,370	685,355	824,531		11.0	3.9
Communications	167,418	177,930	169,933	172,526		6.0	3.3
Amusements	125,384	166,178	130,254	113,398		5.6	9.2
Rentals - Personal Property	368,736	400,269	362,285	361,745		10.3	8.3
Contracting	895,035	1,067,814	1,030,988	1,110,476		14.2	15.1
Mining-Metal, Oil & Gas, incl.severance	81,951	102,662	86,705	103,165		10.1	29.8
Hotel/Motel	360,395	480,335	335,939	284,929		9.7	10.4
New Housing Units Authorized, Census C-40							
Total Units	3,005	3,132	4,261	3,621	3,557	4.6	11.1
Single Family Units	2,198	2,667	2,913	2,941	3,074	21.4	15.8
2-4 Unit Structures	54	79	64	34	131	118.3	46.5
5-plus Unit Structures	753	386	1,284	646	352	-56.4	-3.0
Bankruptcy Filings, U.S. Bankruptcy Court							
Total	939	1,427	1,480	1,487	1,452	0.8	5.3
Chapter 7	739	1,183	1,186	1,230	1,198	-2.4	4.2
Chapter 11	12	11	10	5	8	-27.3	-12.0
Chapter 13	188	233	284	252	246	21.2	11.0

TABLE A.3
SELECTED ECONOMIC INDICATORS, ARIZONA

	2017	2018	2019	2020	2021	2022	2023	2024
INCOME								
Personal Income (\$ millions)	291,698	305,737	325,054	344,860	364,422	385,436	408,146	431,496
% change	4.1	4.8	6.3	6.1	5.7	5.8	5.9	5.7
Real Personal Income (millions of 2010 dollars)	253,291	258,120	268,745	278,623	288,011	297,580	307,515	317,128
% change	1.3	1.9	4.1	3.7	3.4	3.3	3.3	3.1
Per Capita Personal Income	41,875	43,221	45,221	47,228	49,141	51,180	53,372	55,583
% change	2.2	3.2	4.6	4.4	4.0	4.1	4.3	4.1
Disposable Personal Income (\$mil)	261,978	274,751	292,478	310,426	327,999	346,829	367,174	388,101
% change	4.1	4.9	6.5	6.1	5.7	5.7	5.9	5.7
Real Per Capita Disposable Income (2010 dollars)	32,657	32,791	33,640	34,347	34,955	35,556	36,176	36,743
% change	-0.7	0.4	2.6	2.1	1.8	1.7	1.7	1.6
Disposable Income less Transfers (millions of 2010 dollars)	175,260	178,674	185,224	191,374	196,939	202,613	208,234	213,353
% change	1.4	1.9	3.7	3.3	2.9	2.9	2.8	2.5
Disposable Income as % of Total	89.8	89.9	90.0	90.0	90.0	90.0	90.0	89.9
SALES (\$ millions)								
Retail Sales (2010 dollars)	86,718	88,490	90,639	92,621	94,332	96,028	97,912	99,764
% change	2.5	2.0	2.4	2.2	1.8	1.8	2.0	1.9
Retail Sales (current dollars)	99,866	104,810	109,629	114,637	119,356	124,375	129,950	135,740
% change	5.4	5.0	4.6	4.6	4.1	4.2	4.5	4.5
Food Sales	13,073	13,593	14,079	14,628	15,256	15,855	16,459	17,106
% change	3.4	4.0	3.6	3.9	4.3	3.9	3.8	3.9
Retail Sales less Food	65,517	68,116	71,212	74,582	77,680	80,945	84,658	88,561
% change	4.0	4.0	4.5	4.7	4.2	4.2	4.6	4.6
Restaurant and Bar Sales	14,044	14,847	15,722	16,637	17,634	18,638	19,669	20,622
% change	6.0	5.7	5.9	5.8	6.0	5.7	5.5	4.8
Gasoline Sales	7,232	8,254	8,616	8,790	8,786	8,937	9,165	9,452
% change	22.9	14.1	4.4	2.0	0.0	1.7	2.5	3.1
OTHER INDICATORS								
Population (000s)	6,965.9	7,073.9	7,188.2	7,302.0	7,415.9	7,531.0	7,647.2	7,763.0
% change	1.9	1.6	1.6	1.6	1.6	1.6	1.5	1.5
change	130.4	108.0	114.3	113.8	113.9	115.1	116.2	115.9
Nonfarm Employment	2,772.5	2,845.3	2,916.3	2,981.5	3,035.5	3,088.8	3,144.3	3,196.8
% change	2.4	2.6	2.5	2.2	1.8	1.8	1.8	1.7
change	64.1	72.7	71.0	65.2	54.1	53.3	55.4	52.5
Military Employment (000s)	32.8	32.8	32.8	32.8	32.8	32.8	32.8	32.8
% change	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unemployment Rate, percent	4.9	4.5	3.9	4.0	4.3	4.6	4.8	4.8
Employment to Population Ratio (%)	45.20	45.60	45.80	46.10	46.40	46.50	46.70	46.70
Residential Permits (units)	39,472	41,738	43,268	43,426	43,474	43,615	43,588	43,475
% change	10.9	5.7	3.7	0.4	0.1	0.3	-0.1	-0.3
Single Family	28,072	31,823	33,667	33,993	34,069	34,192	34,187	34,104
% change	13.0	13.4	5.8	1.0	0.2	0.4	0.0	-0.2
Multi-Family	11,400	9,915	9,601	9,433	9,405	9,423	9,401	9,371
% change	6.3	-13.0	-3.2	-1.7	-0.3	0.2	-0.2	-0.3
Gasoline Sales (mil of gals)	3,189	2,987	3,052	3,097	3,154	3,204	3,250	3,294
% change	9.7	-6.3	2.2	1.4	1.9	1.6	1.4	1.3
Avg. Nonfarm Wage Rate	52,497	53,980	55,726	57,727	59,827	62,050	64,373	66,765
% change	2.1	2.8	3.2	3.6	3.6	3.7	3.7	3.7

TABLE A.4A

EMPLOYMENT BY INDUSTRY, ARIZONA

	2017	2018	2019	2020	2021	2022	2023	2024
<i>Thousands</i>								
Nonfarm Employment	2,772.5	2,845.3	2,916.3	2,981.5	3,035.5	3,088.8	3,144.3	3,196.8
% change	2.4	2.6	2.5	2.2	1.8	1.8	1.8	1.7
Private Employment	2,359.2	2,430.7	2,498.6	2,558.3	2,610.6	2,661.0	2,713.3	2,762.4
% change	2.7	3.0	2.8	2.4	2.0	1.9	2.0	1.8
Goods-Producing	321.3	340.5	348.4	350.9	350.2	349.6	349.5	350.0
% change	4.7	5.9	2.3	0.7	-0.2	-0.2	0.0	0.1
Mining and Logging	11.7	12.0	12.1	12.0	11.8	11.6	11.5	11.3
% change	1.1	2.3	0.8	-0.5	-1.5	-1.6	-1.4	-1.2
Metal Ore Mining	9.5	9.8	9.9	9.8	9.6	9.4	9.2	9.1
% change	2.4	3.4	0.2	-1.1	-2.0	-2.0	-1.8	-1.5
Other Mining	2.2	2.1	2.2	2.2	2.3	2.3	2.3	2.3
% change	-4.1	-2.5	3.8	2.2	0.8	0.3	0.0	0.0
Construction	145.4	156.6	160.2	161.6	161.5	161.3	161.2	161.4
% change	7.4	7.7	2.3	0.8	0.0	-0.1	0.0	0.1
Manufacturing	164.3	171.9	176.1	177.3	176.9	176.7	176.8	177.3
% change	2.6	4.6	2.4	0.7	-0.2	-0.1	0.1	0.3
Durable Goods	123.7	130.0	134.0	135.0	134.5	134.2	134.3	134.7
% change	2.1	5.1	3.1	0.8	-0.4	-0.2	0.1	0.3
Fabricated Metal Products	19.4	19.8	20.0	20.2	20.1	20.2	20.5	20.7
% change	-0.6	2.2	1.1	0.7	-0.2	0.5	1.3	1.1
Computer and Electronic Products	31.5	33.9	34.8	34.8	34.7	34.8	34.9	35.1
% change	-0.4	7.9	2.6	0.0	-0.5	0.3	0.4	0.5
Aerospace Products and Parts	26.6	28.0	29.6	30.1	30.2	30.3	30.2	30.2
% change	2.6	5.2	5.8	1.5	0.3	0.3	-0.3	0.1
Nondurable Goods	40.6	41.9	42.1	42.3	42.4	42.5	42.6	42.6
% change	4.2	3.1	0.5	0.4	0.3	0.2	0.2	0.2
Government	413.3	414.5	417.7	423.2	424.9	427.9	430.9	434.4
% change	0.6	0.3	0.8	1.3	0.4	0.7	0.7	0.8
Federal	55.7	55.6	56.0	58.0	56.3	56.5	56.7	56.8
% change	0.8	-0.3	0.8	3.7	-2.9	0.3	0.3	0.3
State and Local	357.6	359.0	361.7	365.1	368.6	371.4	374.3	377.6
% change	0.5	0.4	0.8	1.0	0.9	0.7	0.8	0.9
State and Local Education	190.8	190.9	191.7	193.0	194.3	195.5	197.0	198.8
% change	0.6	0.0	0.4	0.7	0.6	0.6	0.8	0.9
State and Local Excluding Education	166.7	168.1	170.0	172.1	174.3	175.9	177.3	178.8
% change	0.5	0.8	1.1	1.2	1.3	0.9	0.8	0.9
<i>Arizona employment continued next page...</i>								
Addenda:								
Household Employment	3,151.5	3,227.8	3,293.5	3,369.1	3,438.1	3,505.1	3,570.0	3,627.9
% change	3.2	2.4	2.0	2.3	2.0	1.9	1.9	1.6
Unemployment	161.4	148.7	132.7	139.9	153.9	168.5	178.8	183.1
% change	-6.7	-7.9	-10.7	5.4	10.0	9.5	6.1	2.4

TABLE A.4B
EMPLOYMENT BY INDUSTRY, ARIZONA

	2017	2018	2019	2020	2021	2022	2023	2024
<i>Thousands</i>								
Service Providing	2,451.2	2,504.8	2,567.9	2,630.6	2,685.3	2,739.2	2,794.7	2,846.7
% change	2.1	2.2	2.5	2.4	2.1	2.0	2.0	1.9
Trade, Transportation and Utilities	524.2	535.1	548.4	559.0	567.7	576.0	585.7	595.5
% change	1.4	2.1	2.5	1.9	1.6	1.5	1.7	1.7
Wholesale Trade	95.2	95.7	96.9	97.7	98.7	99.7	101.4	103.3
% change	1.1	0.6	1.2	0.8	1.1	1.0	1.7	1.9
Retail Trade	331.1	338.4	349.0	358.2	365.5	372.6	380.4	387.9
% change	1.0	2.2	3.2	2.6	2.0	1.9	2.1	2.0
Clothing and General Merchandise	88.5	89.3	91.6	94.1	96.3	98.3	100.4	102.5
% change	-0.8	0.9	2.6	2.7	2.3	2.1	2.1	2.1
Motor Vehicles and Parts	44.9	46.1	48.1	48.9	49.1	49.3	49.7	50.4
% change	2.1	2.7	4.4	1.6	0.4	0.4	1.0	1.4
Furniture and Home Furnishings	10.6	10.8	11.3	11.6	11.8	11.9	12.2	12.5
% change	1.8	2.1	5.2	2.7	1.1	1.3	2.1	2.8
Building Materials, Garden Supply	25.4	27.5	28.5	29.5	30.4	31.2	32.0	32.9
% change	4.2	8.3	3.4	3.6	2.9	2.7	2.7	2.7
Food and Beverage	60.4	61.1	63.2	64.9	66.3	67.8	69.4	70.9
% change	3.9	1.1	3.5	2.7	2.2	2.3	2.3	2.2
Other Retail	101.4	103.6	106.3	109.2	111.7	114.2	116.7	118.7
% change	-0.6	2.2	2.6	2.7	2.3	2.2	2.2	1.8
Utilities	12.3	12.2	12.1	12.0	11.9	11.8	11.7	11.6
% change	-0.7	-0.3	-1.1	-0.8	-0.6	-0.9	-1.0	-1.0
Transportation and Warehousing	85.6	88.8	90.4	91.1	91.6	91.9	92.2	92.7
% change	4.0	3.7	1.8	0.8	0.5	0.4	0.4	0.5
Information	45.2	45.6	46.7	48.3	49.5	49.1	48.3	47.7
% change	0.2	0.8	2.4	3.4	2.6	-0.7	-1.8	-1.1
Telecommunications	15.1	15.0	15.4	16.0	16.4	16.2	15.8	15.5
% change	-2.2	-0.5	2.5	3.9	3.0	-1.2	-2.6	-2.0
Other Information	30.2	30.6	31.4	32.3	33.1	32.9	32.5	32.2
% change	1.4	1.5	2.4	3.1	2.3	-0.5	-1.4	-0.7
Financial Activities	213.9	220.6	227.8	233.1	237.6	242.2	247.2	252.4
% change	4.5	3.1	3.3	2.3	1.9	2.0	2.1	2.1
Finance and Insurance	162.9	168.2	174.5	179.3	183.6	188.0	192.6	197.1
% change	5.0	3.3	3.7	2.8	2.4	2.4	2.4	2.4
Real Estate	51.0	52.3	53.3	53.8	54.0	54.2	54.7	55.3
% change	2.7	2.6	2.0	0.8	0.4	0.5	0.8	1.1
Professional and Business Services	420.3	431.3	445.7	458.5	469.6	480.1	491.1	501.7
% change	1.8	2.6	3.3	2.9	2.4	2.2	2.3	2.1
Education and Health Services	426.6	440.8	452.7	469.4	487.8	506.9	525.2	539.6
% change	3.3	3.3	2.7	3.7	3.9	3.9	3.6	2.7
Educational Services	61.8	66.4	67.3	68.5	69.7	70.9	72.2	73.6
% change	3.5	7.4	1.3	1.8	1.7	1.7	1.9	2.0
Health Care and Social Assistance	364.8	374.4	385.5	400.9	418.2	436.0	453.0	466.0
% change	3.3	2.6	3.0	4.0	4.3	4.3	3.9	2.9
Leisure and Hospitality	319.2	327.2	337.0	345.7	353.0	360.0	367.5	375.0
% change	3.0	2.5	3.0	2.6	2.1	2.0	2.1	2.1
Art, Entertainment, and Recreation	42.3	42.6	44.9	45.8	46.5	47.2	48.0	48.9
% change	3.3	0.8	5.4	1.9	1.5	1.5	1.7	1.8
Accommodation	46.4	46.9	47.6	47.7	47.6	47.6	47.7	48.0
% change	1.8	0.9	1.7	0.2	-0.2	-0.1	0.2	0.5
Food Services and Drinking Places	230.5	237.7	244.5	252.1	258.8	265.2	271.7	278.1
% change	3.3	3.1	2.9	3.1	2.6	2.5	2.5	2.4
Other Services	88.5	89.8	91.8	93.5	95.2	97.0	98.7	100.5
% change	0.1	1.4	2.3	1.9	1.8	1.8	1.8	1.8

TABLE A.5
POPULATION AND COMPONENTS OF CHANGE, ARIZONA

	2017	2018	2019	2020	2021	2022	2023	2024
<i>Thousands</i>								
Population (mid-year)	6,965.9	7,073.9	7,188.2	7,302.0	7,415.9	7,531.0	7,647.2	7,763.0
% change	1.9	1.6	1.6	1.6	1.6	1.6	1.5	1.5
change	130.4	108.0	114.3	113.8	113.9	115.1	116.2	115.9
DERIVATION:								
Population, previous year	6,835.5	6,965.9	7,073.9	7,188.2	7,302.0	7,415.9	7,531.0	7,647.2
plus:								
Natural Increase	26.7	26.2	32.8	33.5	33.4	33.9	34.1	33.6
equals:								
Births	83.0	84.9	90.5	92.0	92.7	94.1	95.1	95.7
minus:								
Deaths	56.3	58.6	57.8	58.5	59.3	60.2	61.0	62.1
plus:								
Net Migration	103.6	81.8	81.5	80.3	80.6	81.2	82.1	82.2
RATES OF CHANGE:								
<i>Percent Change from Prior Year</i>								
Natural Increase	-6.2	-1.9	24.9	2.3	-0.4	1.6	0.5	-1.2
Births	-1.7	2.2	6.7	1.6	0.8	1.5	1.1	0.7
Deaths	0.6	4.2	-1.5	1.3	1.4	1.4	1.4	1.8
Net Migration	112.6	-21.1	-0.3	-1.5	0.3	0.8	1.2	0.1
ADDENDUM:								
<i>Number per 1,000 Persons</i>								
Birth Rate	12.1	12.2	12.8	12.8	12.7	12.7	12.6	12.5
Death Rate	8.2	8.4	8.2	8.1	8.1	8.1	8.1	8.1
Net Migration Rate	15.2	11.7	11.5	11.2	11.0	11.0	10.9	10.8

TABLE A.6
PERSONAL INCOME BY SOURCE, ARIZONA

	2017	2018	2019	2020	2021	2022	2023	2024
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\$ Millions, Seasonally Adjusted Annual Rate

Total Personal Income	291,698	305,737	325,054	344,860	364,422	385,436	408,146	431,496
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DERIVATION:

Earnings by Place of Work	197,929	208,354	220,799	233,689	245,792	258,474	272,040	286,060
less: Contr. to Social Insurance	23,319	24,778	25,934	27,172	28,403	29,736	31,189	32,707
plus: Residence Adjustment	1,580	1,661	1,780	1,903	2,019	2,141	2,271	2,405
plus: Dividends, Interest, & Rent	55,366	57,385	59,963	62,882	66,202	70,160	74,225	77,931
plus: Transfer Payments	60,142	63,115	68,445	73,558	78,812	84,398	90,800	97,807

COMPONENTS OF EARNINGS:

Proprietors' Income	19,883	20,963	22,659	23,919	24,530	25,047	25,618	26,295
Other Labor Income	32,490	33,796	35,621	37,651	39,646	41,755	44,007	46,323
Wages and Salaries	145,556	153,595	162,520	172,119	181,616	191,672	202,414	213,442
Private	122,846	130,405	138,586	147,181	155,827	164,953	174,718	184,727
Government	22,709	23,190	23,934	24,938	25,788	26,719	27,696	28,715
Federal Government, Civilian	4,183	4,291	4,392	4,621	4,707	4,874	5,047	5,226
Federal Government, Military	1,533	1,560	1,574	1,605	1,637	1,670	1,703	1,737
State & Local Government	16,994	17,339	17,968	18,712	19,444	20,175	20,946	21,752

Percent Change from Prior Year

Total Personal Income	4.1	4.8	6.3	6.1	5.7	5.8	5.9	5.7
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DERIVATION:

Earnings by Place of Work	4.7	5.3	6.0	5.8	5.2	5.2	5.2	5.2
less: Contr. to Social Insurance	5.9	6.3	4.7	4.8	4.5	4.7	4.9	4.9
plus: Residence Adjustment	3.2	5.1	7.2	6.9	6.1	6.0	6.1	5.9
plus: Dividends, Interest, & Rent	3.5	3.6	4.5	4.9	5.3	6.0	5.8	5.0
plus: Transfer Payments	3.6	4.9	8.4	7.5	7.1	7.1	7.6	7.7

COMPONENTS OF EARNINGS:

Proprietors' Income	5.9	5.4	8.1	5.6	2.6	2.1	2.3	2.6
Other Labor Income	5.0	4.0	5.4	5.7	5.3	5.3	5.4	5.3
Wages and Salaries	4.5	5.5	5.8	5.9	5.5	5.5	5.6	5.4
Private	4.7	6.2	6.3	6.2	5.9	5.9	5.9	5.7
Government	3.1	2.1	3.2	4.2	3.4	3.6	3.7	3.7
Federal Government, Civilian	3.4	2.6	2.4	5.2	1.9	3.5	3.6	3.5
Federal Government, Military	4.1	1.8	0.9	2.0	2.0	2.0	2.0	2.0
State & Local Government	3.0	2.0	3.6	4.1	3.9	3.8	3.8	3.8

TABLE A.7
WAGES AND PRICES, ARIZONA AND U.S.

	2017	2018	2019	2020	2021	2022	2023	2024
ARIZONA								
	<i>Current Dollars</i>							
Avg. Nonfarm Wage Rate	52,497	53,980	55,726	57,727	59,827	62,050	64,373	66,765
Private	52,068	53,644	55,462	57,527	59,687	61,986	64,389	66,869
Government								
Federal Government, Civilian	75,071	77,240	78,472	79,692	83,570	86,265	89,057	91,945
Federal Government, Military	46,069	47,037	47,978	48,937	49,916	50,914	51,933	52,971
State & Local Government	47,523	48,302	49,676	51,244	52,750	54,326	55,963	57,610
	<i>Percent Change from Prior Year</i>							
Avg. Nonfarm Wage Rate	2.1	2.8	3.2	3.6	3.6	3.7	3.7	3.7
Private	2.0	3.0	3.4	3.7	3.8	3.9	3.9	3.9
Government								
Federal Government, Civilian	2.5	2.9	1.6	1.6	4.9	3.2	3.2	3.2
Federal Government, Military	2.6	2.1	2.0	2.0	2.0	2.0	2.0	2.0
State & Local Government	2.4	1.6	2.8	3.2	2.9	3.0	3.0	2.9
U.S. (Nonfarm)								
Employment Cost Index, Private	2.5	3.3	3.4	3.6	3.9	3.9	3.9	3.8
Productivity, Business Sector	1.3	1.5	1.4	1.2	1.4	1.8	1.8	1.7
Unit Labor Costs, Business Sector	0.4	1.2	1.8	2.7	2.6	2.2	2.2	2.1
PRICES (% change)								
CPI, All Urban, Western Region	2.8	2.8	2.1	2.3	2.2	2.4	2.5	2.5
CPI, All Urban, U.S.	2.1	2.6	2.1	2.3	2.2	2.3	2.4	2.5
GDP Deflator Chained) U.S.	1.8	2.2	2.7	2.7	2.6	2.4	2.3	2.3
Personal Consumption Deflator, U.S.	1.7	2.2	2.1	2.2	2.2	2.2	2.3	2.3
Unleaded Gasoline Price, PHX (\$/gal)	2.27	2.76	2.82	2.84	2.79	2.79	2.82	2.87
% change	11.9	21.8	2.3	0.6	-1.9	0.1	1.1	1.8

TABLE A.8
ALTERNATIVE SCENARIOS, ARIZONA

	2017	2018	2019	2020	2021	2022	2023	2024
Personal Income	<i>Percent Change</i>							
High	4.1	5.1	7.8	7.7	6.8	6.4	6.5	6.4
Base	4.1	4.8	6.3	6.1	5.7	5.8	5.9	5.7
Low	4.1	4.6	5.0	4.1	5.4	5.7	5.9	5.9
Population								
High	1.9	1.9	2.0	2.0	2.0	1.9	1.9	1.9
Base	1.9	1.6	1.6	1.6	1.6	1.6	1.5	1.5
Low	1.9	1.4	1.4	1.3	1.3	1.4	1.4	1.4
Nonfarm Employment								
High	2.4	2.9	3.8	3.5	2.7	2.2	2.2	2.1
Base	2.4	2.6	2.5	2.2	1.8	1.8	1.8	1.7
Low	2.4	2.5	1.4	0.9	1.4	1.7	1.8	1.6
Manufacturing Employment								
High	2.6	5.7	6.0	1.3	-0.4	-0.4	-0.1	0.2
Base	2.6	4.6	2.4	0.7	-0.2	-0.1	0.1	0.3
Low	2.6	3.6	-1.4	-0.4	0.4	0.3	0.4	0.5
Construction Employment								
High	7.4	8.5	6.3	4.4	2.1	0.4	-0.3	-0.3
Base	7.4	7.7	2.3	0.8	0.0	-0.1	0.0	0.1
Low	7.4	7.4	-0.1	-1.8	-1.1	-0.5	0.7	0.9
Housing Permits								
High	10.9	21.3	12.4	4.9	0.0	-1.4	-1.4	0.2
Base	10.9	5.7	3.7	0.4	0.1	0.3	-0.1	-0.3
Low	10.9	-2.1	-3.0	-7.1	2.0	6.0	1.2	-0.2
Retail Sales								
High	5.4	5.1	5.2	5.8	5.1	4.9	5.1	5.1
Base	5.4	5.0	4.6	4.6	4.1	4.2	4.5	4.5
Low	5.4	4.8	3.5	3.0	3.5	4.3	4.5	4.6
Avg. Earnings								
High	2.1	2.9	3.6	3.9	3.8	3.9	4.0	3.9
Base	2.1	2.8	3.2	3.6	3.6	3.7	3.7	3.7
Low	2.1	2.8	2.8	3.2	3.8	3.7	3.6	3.7

TABLE M.1

FORECAST COMPARISON, PHOENIX-MESA-GLENDALE MSA, CURRENT (18Q3) VS. PRIOR (18Q2)

	2017	2018	2019	2020	2021	2022	2023	2024
Personal Income								
	<i>Percent Change</i>							
Current	4.5	5.7	6.3	6.5	6.2	5.9	6.0	6.0
Prior	4.8	6.0	6.4	6.6	6.4	6.1	6.1	5.9
Difference	-0.3	-0.3	-0.1	-0.1	-0.3	-0.2	-0.1	0.1
Population								
Current	2.2	1.8	1.8	1.8	1.8	1.8	1.7	1.7
Prior	2.2	1.8	1.8	1.9	1.9	1.8	1.8	1.8
Difference	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	0.0
Nonfarm Employment								
Current	2.8	3.1	2.9	2.6	2.1	1.9	1.9	2.0
Prior	2.8	2.8	2.8	2.7	2.4	2.1	1.9	1.8
Difference	0.0	0.3	0.1	-0.1	-0.3	-0.3	-0.1	0.2
Manufacturing Employment								
Current	2.4	4.5	2.7	1.1	0.2	0.2	0.4	0.6
Prior	2.4	2.7	2.4	1.6	0.6	0.4	0.8	0.8
Difference	0.0	1.8	0.4	-0.6	-0.4	-0.2	-0.4	-0.2
Construction Employment								
Current	7.8	6.7	2.3	2.8	0.6	0.0	0.1	0.1
Prior	7.8	4.1	2.5	2.5	1.4	0.3	-0.1	-0.3
Difference	0.0	2.6	-0.2	0.2	-0.8	-0.3	0.1	0.4
Housing Permits								
Current	2.6	11.8	2.2	-0.1	0.1	0.2	0.1	0.5
Prior	5.2	7.4	4.7	1.3	0.3	-0.7	-0.8	0.0
Difference	-2.7	4.4	-2.5	-1.3	-0.1	0.9	0.9	0.5
Retail Sales								
Current	5.5	6.1	4.8	4.9	4.6	4.7	4.8	4.6
Prior	5.5	4.1	4.6	6.1	4.7	4.5	4.7	4.3
Difference	0.0	1.9	0.2	-1.1	-0.1	0.2	0.1	0.3
Avg. Earnings								
Current	2.6	3.1	3.5	3.4	3.0	3.1	3.2	3.4
Prior	2.7	3.7	3.7	3.5	3.3	3.3	3.3	3.4
Difference	-0.2	-0.6	-0.2	-0.1	-0.3	-0.2	-0.1	-0.1

*Some numbers may not add due to rounding.

TABLE M.2

CURRENT ECONOMIC INDICATORS, PHOENIX-MESA-GLENDALE MSA

	% change versus year ago for:						
	FEB	MAR	APR	MAY	JUN	most	most
	2018	2018	2018	2018	2018	recent mo.	recent 12-mo.
Civilian Labor Force (000s) BLS	2,370.7	2,370.6	2,357.5	2,347.8	2,350.9	2.3	3.1
Employment	2,266.4	2,274.5	2,267.5	2,267.7	2,252.7	2.5	3.5
Unemployment	104.3	96.1	89.9	80.1	98.2	-2.6	-4.8
Unemployment Rate, Seas. Adj. (%)	4.5	4.1	4.0	3.6	4.0	-4.8	-7.5

Employees on Nonfarm Payrolls (000s) BLS, EBRC Benchmark

Total Nonfarm	2,081.5	2,090.8	2,094.1	2,087.7	2,060.6	3.1	2.8
Natural Resources and Mining	3.1	3.1	3.2	3.2	3.2	-3.0	-0.5
Construction	118.1	119.6	121.5	123.8	127.6	11.4	9.4
Durable Goods Manufacturing	94.4	94.3	94.5	95.8	97.1	7.2	5.1
Computer and Electronic Products	30.3	30.5	30.5	30.6	31.2	8.7	6.3
Aerospace Products and Parts	14.2	14.2	14.2	14.3	14.4	1.4	0.3
Non-Durable Goods Manufacturing	33.4	33.6	33.4	33.6	33.8	3.4	5.3
Wholesale Trade	79.7	81.0	79.8	79.6	79.9	0.4	0.9
Retail Trade	242.2	241.6	240.4	240.3	239.3	1.4	1.6
Utilities	8.3	8.4	8.4	8.4	8.4	1.2	0.8
Transportation and Warehousing	68.3	69.2	68.9	69.5	70.0	5.6	3.9
Information	35.9	36.1	36.4	37.1	37.3	2.5	0.7
Finance and Insurance	147.9	147.1	146.9	147.2	147.0	1.2	3.6
Real Estate, Rental, and Leasing	42.1	42.4	42.4	41.6	42.3	4.4	2.6
Professional and Business Services	348.7	349.7	350.8	348.5	351.0	3.0	1.8
Educational Services	57.1	56.5	57.0	54.7	49.4	11.5	10.2
Health Care and Social Assistance	261.5	262.6	262.9	264.4	265.1	3.1	3.1
Leisure and Hospitality	228.7	233.4	234.9	232.8	226.9	3.0	3.1
Other Services	65.0	65.5	65.8	66.6	66.1	0.2	0.0
Federal Government	22.7	22.7	22.7	22.7	22.7	-0.9	0.6
State and Local Government	224.4	224.0	224.2	217.9	193.5	-0.3	0.3
State and Local Education	124.8	124.4	124.5	116.8	92.6	3.8	0.4

Sales (\$000s) ADOR

Aggregate Retail Sales	5,927,082	6,823,193	6,206,403	6,392,755		6.7	5.4
Retail	3,857,735	4,591,930	4,027,645	4,233,982		5.6	5.4
Food, EBRC	774,092	776,929	779,722	782,470	785,172	4.8	4.4
Restaurants & Bars	943,724	1,050,152	965,306	900,140		2.8	6.4
Gasoline, EBRC	351,531	404,182	433,729	476,164		31.2	4.3
Hotel/Motel	252,476	337,803	208,353	155,114		7.6	7.4

New Housing Units Authorized, Census C-40

Total Units	2,375	2,377	3,323	2,660	2,596	-1.7	9.4
Single Family Units	1,593	1,943	2,185	2,112	2,307	28.2	14.1
2-4 Unit Structures	34	64	38	26	97	79.6	31.9
5-plus Unit Structures	748	370	1,100	522	192	-75.6	-2.3

Housing Sales and Prices, ARMLS

Total Sales (millions)	2,178	3,057	2,962	3,353	3,077	5.4	11.6
Total Units	7,052	9,615	9,170	10,091	9,234	-3.5	2.6
Average Price (\$)	308,914	317,899	323,064	332,242	333,208	9.3	8.7

Phoenix Sky Harbor International Airport, PSIA

Total Passengers	3,461,583	4,379,348	3,862,015	3,901,646	3,770,453	0.4	1.8
Total Aircraft Movements	33,539	40,349	37,044	37,172	35,168	-1.7	-0.9

TABLE M.3
SELECTED ECONOMIC INDICATORS, PHOENIX-MESA-GLENDALE MSA

	2017	2018	2019	2020	2021	2022	2023	2024
INCOME								
Personal Income (\$ millions)	205,615	217,418	231,069	246,154	261,317	276,846	293,330	310,824
% change	4.5	5.7	6.3	6.5	6.2	5.9	6.0	6.0
Per Capita Personal Income (\$)	44,225	45,938	47,949	50,177	52,332	54,483	56,739	59,109
% change	2.3	3.9	4.4	4.6	4.3	4.1	4.1	4.2
Annual Earnings Per Worker (\$)	55,623	57,331	59,318	61,341	63,194	65,143	67,244	69,503
% change	2.6	3.1	3.5	3.4	3.0	3.1	3.2	3.4
Disposable Personal Income (\$mil)	184,665	195,382	207,911	221,576	235,199	249,116	263,884	279,565
% change	4.4	5.8	6.4	6.6	6.1	5.9	5.9	5.9
Real Per Capita Disposable Income (2010 dollars)	34,490	34,854	35,672	36,494	37,228	37,853	38,460	39,075
% change	-0.6	1.1	2.3	2.3	2.0	1.7	1.6	1.6
Disposable Income less Transfers (millions of 2010 dollars)	128,836	132,730	138,383	143,840	148,743	153,458	158,077	162,738
% change	1.7	3.0	4.3	3.9	3.4	3.2	3.0	2.9
SALES (\$ millions)								
Retail Sales (2010 dollars)	61,602	63,541	65,206	66,855	68,385	69,954	71,554	72,991
% change	2.6	3.1	2.6	2.5	2.3	2.3	2.3	2.0
Retail Sales (current dollars)	70,942	75,259	78,863	82,743	86,523	90,602	94,964	99,309
% change	5.5	6.1	4.8	4.9	4.6	4.7	4.8	4.6
Food Sales	9,013	9,435	9,779	10,224	10,705	11,129	11,568	12,047
% change	4.0	4.7	3.6	4.6	4.7	4.0	3.9	4.1
Retail Sales less Food	47,181	49,788	52,269	54,966	57,662	60,530	63,599	66,565
% change	4.0	5.5	5.0	5.2	4.9	5.0	5.1	4.7
Restaurant and Bar Sales	10,152	10,787	11,343	11,971	12,604	13,313	14,027	14,739
% change	7.0	6.3	5.2	5.5	5.3	5.6	5.4	5.1
Gasoline Sales	4,595	5,249	5,472	5,582	5,552	5,630	5,770	5,958
% change	22.8	14.2	4.3	2.0	-0.5	1.4	2.5	3.3
OTHER INDICATORS								
Population (000s)	4,649.3	4,732.8	4,819.0	4,905.7	4,993.4	5,081.3	5,169.8	5,258.5
% change	2.2	1.8	1.8	1.8	1.8	1.8	1.7	1.7
change	98.9	83.6	86.2	86.7	87.7	87.9	88.5	88.7
Nonfarm Employment	2,034.1	2,097.1	2,158.7	2,214.3	2,261.3	2,303.6	2,346.6	2,393.1
% change	2.8	3.1	2.9	2.6	2.1	1.9	1.9	2.0
change	54.9	63.0	61.6	55.6	47.0	42.2	43.0	46.5
Military Employment (000s)	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
% change	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Residential Permits (units)	29,312	32,761	33,475	33,449	33,490	33,560	33,582	33,737
% change	2.6	11.8	2.2	-0.1	0.1	0.2	0.1	0.5
Single Family	20,471	22,122	24,262	25,104	25,343	25,328	25,286	25,328
% change	11.1	8.1	9.7	3.5	1.0	-0.1	-0.2	0.2
Multi-Family	8,841	10,639	9,213	8,345	8,147	8,231	8,297	8,409
% change	-12.9	20.3	-13.4	-9.4	-2.4	1.0	0.8	1.4
Gasoline Sales (mil of gals)	2,028.0	1,902.0	1,939.0	1,966.0	1,993.0	2,019.0	2,046.0	2,076.0
% change	9.7	-6.2	1.9	1.4	1.4	1.3	1.4	1.5

TABLE M.4A

EMPLOYMENT BY INDUSTRY, PHOENIX-MESA-GLENDALE MSA

	2017	2018	2019	2020	2021	2022	2023	2024
<i>Thousands</i>								
Nonfarm Employment	2,034.1	2,097.1	2,158.7	2,214.3	2,261.3	2,303.6	2,346.6	2,393.1
% change	2.8	3.1	2.9	2.6	2.1	1.9	1.9	2.0
Private Employment	1,796.4	1,857.9	1,916.6	1,969.2	2,014.4	2,054.6	2,095.5	2,139.3
% change	3.0	3.4	3.2	2.7	2.3	2.0	2.0	2.1
Goods-Producing	240.0	253.2	259.5	264.2	265.2	265.4	266.0	266.8
% change	4.8	5.5	2.5	1.8	0.4	0.1	0.2	0.3
Mining and Logging	3.2	3.2	3.2	3.1	3.0	3.0	2.9	2.9
% change	-1.0	-1.2	1.8	-2.5	-2.8	-2.4	-1.8	-1.1
Construction	113.5	121.2	123.9	127.3	128.1	128.1	128.2	128.3
% change	7.8	6.7	2.3	2.8	0.6	0.0	0.1	0.1
Manufacturing	123.3	128.9	132.4	133.8	134.1	134.4	134.9	135.7
% change	2.4	4.5	2.7	1.1	0.2	0.2	0.4	0.6
Durable Goods	90.7	94.6	97.1	97.8	97.4	97.1	97.0	97.1
% change	1.8	4.4	2.6	0.7	-0.4	-0.3	-0.1	0.1
Computer and Electronic Products	28.8	30.1	30.7	30.6	30.4	30.3	30.4	30.4
% change	-0.3	4.7	2.1	-0.3	-0.8	-0.1	0.0	0.2
Aerospace Products and Parts	14.2	14.4	15.2	15.4	15.4	15.5	15.4	15.4
% change	-1.1	1.8	5.1	1.3	0.3	0.3	-0.2	0.1
Nondurable Goods	32.6	34.2	35.2	36.0	36.7	37.3	37.9	38.5
% change	4.2	4.8	3.0	2.0	2.0	1.7	1.7	1.6
<i>Phoenix-Mesa metro area employment continued next page...</i>								
Government	237.7	239.2	242.1	245.1	247.0	249.0	251.2	253.8
% change	0.8	0.6	1.2	1.3	0.8	0.8	0.9	1.1
Federal	22.9	23.1	23.2	23.4	22.9	22.9	22.9	22.9
% change	2.3	0.7	0.5	0.9	-2.3	0.0	0.0	0.0
State and Local	214.8	216.1	218.9	221.7	224.1	226.1	228.3	230.9
% change	0.7	0.6	1.3	1.3	1.1	0.9	1.0	1.2
State and Local Education	113.7	114.0	115.0	116.1	117.1	118.1	119.2	120.6
% change	0.6	0.2	0.9	0.9	0.9	0.8	1.0	1.2
State and Local Excluding Education	101.0	102.1	103.8	105.6	107.0	108.0	109.0	110.3
% change	0.7	1.1	1.7	1.7	1.3	0.9	0.9	1.2

TABLE M.4B

EMPLOYMENT BY INDUSTRY, PHOENIX-MESA-GLENDALE MSA

	2017	2018	2019	2020	2021	2022	2023	2024
	<i>Thousands</i>							
Service Providing	1,794.1	1,843.9	1,899.2	1,950.1	1,996.2	2,038.2	2,080.6	2,126.3
% change	2.5	2.8	3.0	2.7	2.4	2.1	2.1	2.2
Trade, Transportation and Utilities	394.1	402.1	411.5	420.1	427.3	434.1	441.4	449.8
% change	1.9	2.0	2.3	2.1	1.7	1.6	1.7	1.9
Wholesale Trade	79.5	81.1	81.1	82.3	83.1	84.0	85.1	86.8
% change	1.6	2.1	0.0	1.5	0.9	1.1	1.4	1.9
Retail Trade	239.1	242.6	250.5	257.2	263.1	268.6	274.4	280.7
% change	1.5	1.5	3.2	2.7	2.3	2.1	2.1	2.3
Motor Vehicles and Parts	32.0	33.0	34.3	35.0	35.5	36.0	36.6	37.4
% change	2.7	3.2	4.0	2.1	1.3	1.3	1.8	2.2
Building Materials, Garden Supply	17.4	18.2	18.9	19.5	20.0	20.5	20.9	21.4
% change	4.6	4.7	3.6	2.9	2.6	2.4	2.3	2.3
Food and Beverage	41.2	41.9	42.8	43.7	44.5	45.2	45.8	46.4
% change	4.4	1.7	2.2	2.1	1.8	1.5	1.3	1.3
Other Retail	148.5	149.5	154.4	158.9	163.0	166.9	171.0	175.4
% change	0.2	0.7	3.3	2.9	2.6	2.4	2.4	2.6
Utilities	8.3	8.3	8.2	8.0	7.9	7.7	7.6	7.4
% change	-0.3	0.5	-1.8	-2.0	-1.7	-1.9	-2.1	-2.0
Transportation and Warehousing	67.3	70.0	71.7	72.6	73.2	73.8	74.3	75.0
% change	4.1	4.0	2.4	1.3	0.9	0.8	0.7	0.8
Information	35.8	35.9	36.8	38.3	39.4	38.8	37.8	37.2
% change	-0.4	0.2	2.4	4.1	2.9	-1.4	-2.5	-1.8
Telecommunications	12.3	12.0	12.3	12.9	13.4	13.2	12.8	12.4
% change	-2.8	-2.5	2.2	5.2	4.1	-1.6	-3.5	-2.9
Other Information	23.5	23.9	24.5	25.3	25.9	25.6	25.1	24.8
% change	0.9	1.6	2.5	3.5	2.3	-1.3	-2.0	-1.2
Financial Activities	186.2	193.2	199.2	204.0	208.3	212.3	216.5	221.1
% change	4.7	3.7	3.1	2.4	2.1	1.9	2.0	2.1
Finance and Insurance	145.1	150.8	155.8	160.1	164.3	168.0	171.8	175.8
% change	5.2	3.9	3.3	2.8	2.6	2.3	2.3	2.3
Real Estate	41.1	42.4	43.4	43.8	44.0	44.3	44.8	45.4
% change	3.2	3.0	2.4	1.0	0.5	0.6	1.0	1.3
Professional and Business Services	344.8	355.4	371.1	385.1	397.9	408.5	418.3	428.7
% change	1.8	3.1	4.4	3.8	3.3	2.7	2.4	2.5
Education and Health Services	307.3	321.2	333.1	345.6	358.5	371.9	385.5	399.2
% change	4.4	4.5	3.7	3.7	3.7	3.7	3.6	3.6
Educational Services	50.1	53.5	54.5	55.4	56.3	57.3	58.3	59.5
% change	4.7	6.9	1.7	1.7	1.7	1.7	1.8	2.0
Health Care and Social Assistance	257.2	267.7	278.7	290.1	302.1	314.6	327.2	339.7
% change	4.3	4.1	4.1	4.1	4.1	4.1	4.0	3.8
Leisure and Hospitality	222.6	230.4	237.3	242.4	246.5	250.6	255.3	260.3
% change	3.3	3.5	3.0	2.1	1.7	1.7	1.8	2.0
Art, Entertainment, and Recreation	33.0	33.8	34.6	35.2	35.8	36.4	37.0	37.8
% change	4.4	2.5	2.4	1.8	1.5	1.6	1.8	2.0
Accommodation	25.8	25.8	26.1	26.0	25.9	25.8	25.8	25.9
% change	1.2	-0.1	1.1	-0.1	-0.5	-0.4	-0.1	0.2
Food Services and Drinking Places	163.8	170.8	176.6	181.1	184.8	188.5	192.4	196.6
% change	3.4	4.2	3.4	2.5	2.1	2.0	2.1	2.2
Other Services	65.6	66.6	68.1	69.7	71.4	73.0	74.6	76.2
% change	0.0	1.5	2.4	2.3	2.3	2.3	2.2	2.2

TABLE M.5

POPULATION AND COMPONENTS OF CHANGE, PHOENIX-MESA-GLENDALE MSA

	2017	2018	2019	2020	2021	2022	2023	2024
<i>Thousands</i>								
Population (mid-year)	4,649.3	4,732.8	4,819.0	4,905.7	4,993.4	5,081.3	5,169.8	5,258.5
% change	2.2	1.8	1.8	1.8	1.8	1.8	1.7	1.7
change	98.9	83.6	86.2	86.7	87.7	87.9	88.5	88.7
DERIVATION:								
Population, previous year	4,550.4	4,649.3	4,732.8	4,819.0	4,905.7	4,993.4	5,081.3	5,169.8
plus:								
Natural Increase	24.5	26.1	26.5	27.4	27.9	28.0	27.9	27.7
equals:								
Births	57.6	61.1	62.4	63.5	64.6	65.6	66.7	67.8
minus:								
Deaths	33.1	35.1	35.9	36.1	36.7	37.7	38.8	40.1
plus:								
Net Migration	74.4	57.5	59.7	59.3	59.8	59.9	60.6	61.0
RATES OF CHANGE:								
<i>Percent Change from Prior Year</i>								
Natural Increase	-4.4	6.5	1.6	3.6	1.8	0.3	-0.2	-0.7
Births	-2.0	6.2	2.0	1.9	1.7	1.6	1.7	1.6
Deaths	-0.1	5.9	2.3	0.7	1.7	2.6	3.0	3.3
Net Migration	77.6	-22.8	3.9	-0.8	0.8	0.2	1.2	0.6
ADDENDUM:								
<i>Number per 1,000 Persons</i>								
Birth Rate	12.4	12.9	12.9	13.0	12.9	12.9	12.9	12.9
Death Rate	7.1	7.4	7.5	7.4	7.4	7.4	7.5	7.6
Net Migration Rate	16.0	12.2	12.4	12.1	12.0	11.8	11.7	11.6

TABLE M.6
PERSONAL INCOME BY SOURCE, PHOENIX-MESA-GLENDALE MSA

	2017	2018	2019	2020	2021	2022	2023	2024
<i>\$ Millions, Seasonally Adjusted Annual Rate</i>								
Total Personal Income	205,615	217,418	231,069	246,154	261,317	276,846	293,330	310,824
DERIVATION:								
Earnings by Place of Work	148,354	156,899	166,581	176,854	186,474	196,188	206,471	217,612
less: Contr. to Social Insurance	17,329	18,416	19,295	20,261	21,216	22,209	23,280	24,454
plus: Residence Adjustment	690	715	739	764	788	813	837	862
plus: Dividends, Interest, & Rent	37,603	40,046	42,500	45,246	48,267	51,691	55,211	58,655
plus: Transfer Payments	36,297	38,174	40,544	43,551	47,004	50,363	54,090	58,149
COMPONENTS OF EARNINGS:								
Private	129,900	137,930	146,847	156,297	165,081	173,916	183,262	193,382
Federal Government, Civilian	2,432	2,505	2,591	2,689	2,750	2,855	2,963	3,076
Federal Government, Military	655	659	662	665	669	672	675	679
State & Local Government	15,367	15,806	16,481	17,203	17,973	18,745	19,570	20,476
<i>Percent Change from Prior Year</i>								
Total Personal Income	4.5	5.7	6.3	6.5	6.2	5.9	6.0	6.0
DERIVATION:								
Earnings by Place of Work	5.0	5.8	6.2	6.2	5.4	5.2	5.2	5.4
less: Contr. to Social Insurance	6.0	6.3	4.8	5.0	4.7	4.7	4.8	5.0
plus: Residence Adjustment	3.7	3.6	3.4	3.3	3.2	3.1	3.0	2.9
plus: Dividends, Interest, & Rent	3.6	6.5	6.1	6.5	6.7	7.1	6.8	6.2
plus: Transfer Payments	4.1	5.2	6.2	7.4	7.9	7.1	7.4	7.5
COMPONENTS OF EARNINGS:								
Private	5.3	6.2	6.5	6.4	5.6	5.4	5.4	5.5
Federal Government, Civilian	4.6	3.0	3.5	3.8	2.3	3.8	3.8	3.8
Federal Government, Military	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5
State & Local Government	2.9	2.9	4.3	4.4	4.5	4.3	4.4	4.6

TABLE M.7
EARNINGS AND PRICES, PHOENIX-MESA-GLENDALE MSA

	2017	2018	2019	2020	2021	2022	2023	2024
PHOENIX-MESA, MA								
	<i>Current Dollars</i>							
Avg. Earnings Rate	55,623	57,331	59,318	61,341	63,194	65,143	67,244	69,503
Private	72,311	74,240	76,618	79,371	81,953	84,646	87,457	90,394
Federal Government, Civilian	106,066	108,520	111,681	114,841	120,156	124,690	129,424	134,364
Federal Government, Military	46,962	47,208	47,444	47,682	47,920	48,160	48,400	48,642
State & Local Government	71,558	73,146	75,298	77,587	80,200	82,916	85,739	88,673
	<i>Percent Change from Prior Year</i>							
Avg. Earnings Rate	2.6	3.1	3.5	3.4	3.0	3.1	3.2	3.4
Private	2.2	2.7	3.2	3.6	3.3	3.3	3.3	3.4
Federal Government, Civilian	2.3	2.3	2.9	2.8	4.6	3.8	3.8	3.8
Federal Government, Military	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5
State & Local Government	2.2	2.2	2.9	3.0	3.4	3.4	3.4	3.4
U.S. (Nonfarm)								
Employment Cost Index, Private	2.5	3.3	3.4	3.6	3.9	3.9	3.9	3.8
Productivity, Business Sector	1.3	1.5	1.4	1.2	1.4	1.8	1.8	1.7
Unit Labor Costs, Business Sector	0.4	1.2	1.8	2.7	2.6	2.2	2.2	2.1
PRICES (% change)								
CPI, All Urban, Western Region	2.8	2.8	2.1	2.3	2.2	2.4	2.5	2.5
CPI, All Urban, U.S.	2.1	2.6	2.1	2.3	2.2	2.3	2.4	2.5
GDP Deflator (Chained), U.S.	1.8	2.2	2.7	2.7	2.6	2.4	2.3	2.3
Personal Consumption Deflator, U.S.	1.7	2.2	2.1	2.2	2.2	2.2	2.3	2.3
Unleaded Gasoline Price, PHX (\$/gal)	2.27	2.76	2.82	2.84	2.79	2.79	2.82	2.87
% change	11.9	21.8	2.3	0.6	-1.9	0.1	1.1	1.8

TABLE M.8
ALTERNATIVE SCENARIOS, PHOENIX-MESA-GLENDALE MSA

	2017	2018	2019	2020	2021	2022	2023	2024
Personal Income		<i>Percent Change</i>						
High	4.5	6.3	7.2	7.9	7.0	6.5	6.5	6.6
Base	4.5	5.7	6.3	6.5	6.2	5.9	6.0	6.0
Low	4.5	5.3	5.2	4.5	5.6	5.8	5.8	6.4
Population								
High	2.2	2.1	1.9	2.0	2.0	2.0	1.9	1.9
Base	2.2	1.8	1.8	1.8	1.8	1.8	1.7	1.7
Low	2.2	1.6	1.7	1.5	1.4	1.6	1.6	1.7
Nonfarm Employment								
High	2.8	3.6	3.4	3.4	2.6	2.3	2.2	2.4
Base	2.8	3.1	2.9	2.6	2.1	1.9	1.9	2.0
Low	2.8	2.6	2.1	1.3	1.5	1.7	1.7	2.2
Manufacturing Employment								
High	2.4	8.5	3.9	1.4	0.0	-0.1	0.2	0.5
Base	2.4	4.5	2.7	1.1	0.2	0.2	0.4	0.6
Low	2.4	0.6	1.0	-0.4	1.3	0.9	0.8	0.7
Construction Employment								
High	7.8	8.1	2.6	6.3	-1.1	1.9	-0.2	0.6
Base	7.8	6.7	2.3	2.8	0.6	0.0	0.1	0.1
Low	7.8	5.6	1.9	-0.5	0.8	-2.1	-0.9	3.9
Housing Permits								
High	2.6	26.6	-5.5	6.1	-0.5	2.1	-2.4	1.9
Base	2.6	11.8	2.2	-0.1	0.1	0.2	0.1	0.5
Low	2.6	-0.1	9.1	-8.8	-8.1	11.8	3.5	8.0
Retail Sales								
High	5.5	7.1	4.4	6.4	5.3	5.6	5.4	5.5
Base	5.5	6.1	4.8	4.9	4.6	4.7	4.8	4.6
Low	5.5	4.9	4.1	2.5	3.6	5.2	4.9	5.4
Avg. Earnings								
High	2.6	3.1	3.9	3.8	3.2	3.1	3.5	3.7
Base	2.6	3.1	3.5	3.4	3.0	3.1	3.2	3.4
Low	2.6	3.0	2.6	2.8	3.5	3.1	3.1	3.3

TABLE P.1

FORECAST COMPARISON, TUCSON MSA, CURRENT (18Q3) VS. PRIOR (18Q2)

	2017	2018	2019	2020	2021	2022	2023	2024
Personal Income	<i>Percent Change</i>							
Current	3.1	3.9	4.6	4.9	4.7	4.6	4.7	4.7
Prior	3.3	4.1	4.8	5.1	4.9	4.6	4.8	4.6
Difference	-0.2	-0.2	-0.2	-0.2	-0.2	0.0	-0.1	0.1
Population								
Current	1.3	0.6	0.7	0.8	0.8	0.8	0.8	0.8
Prior	1.3	0.7	0.7	0.7	0.8	0.8	0.8	0.8
Difference	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Nonfarm Employment								
Current	1.5	1.6	1.7	1.4	0.9	0.8	0.9	1.0
Prior	1.5	1.5	1.6	1.4	1.1	0.9	0.9	0.9
Difference	0.0	0.2	0.1	-0.1	-0.2	-0.1	0.0	0.1
Manufacturing Employment								
Current	3.9	2.8	3.0	1.0	0.1	0.2	0.8	0.6
Prior	3.9	3.5	2.9	1.0	0.0	-0.2	0.4	0.5
Difference	0.0	-0.7	0.1	0.0	0.1	0.4	0.5	0.1
Construction Employment								
Current	5.7	4.7	5.1	0.4	0.5	-0.2	-0.2	-0.5
Prior	5.7	0.6	1.6	1.9	1.5	1.0	0.8	-0.1
Difference	0.0	4.1	3.5	-1.5	-1.0	-1.2	-1.0	-0.4
Housing Permits								
Current	82.3	-26.0	5.0	1.2	1.5	0.9	0.1	-0.5
Prior	16.1	7.7	2.2	6.3	7.7	0.8	0.2	0.6
Difference	66.2	-33.7	2.7	-5.1	-6.2	0.1	-0.1	-1.1
Retail Sales								
Current	4.5	5.0	3.7	2.8	2.6	2.8	3.2	3.4
Prior	4.5	3.2	2.6	4.0	2.9	2.6	3.0	2.9
Difference	0.0	1.9	1.2	-1.2	-0.3	0.2	0.1	0.4
Avg. Earnings								
Current	2.0	2.2	3.1	3.7	3.6	3.4	3.1	3.2
Prior	2.2	2.5	3.0	3.6	3.4	3.3	3.4	3.4
Difference	-0.2	-0.3	0.0	0.1	0.2	0.1	-0.3	-0.2

*Some numbers may not add due to rounding.

TABLE P.2

CURRENT ECONOMIC INDICATORS, TUCSON MSA

% change versus year ago for:

	FEB	MAR	APR	MAY	JUN	most	most
	2018	2018	2018	2018	2018	recent mo.	recent 12-mo.
Civilian Labor Force (000s) BLS	486.2	484.6	482.5	481.6	477.7	1.3	1.6
Employment	463.4	463.8	462.9	464.2	456.4	1.5	2.0
Unemployment	22.8	20.8	19.5	17.4	21.3	-3.6	-6.7
Unemployment Rate, Seas. Adj. (%)	4.9	4.4	4.3	3.8	4.2	-4.5	-7.7

Employees on Nonfarm Payrolls (000s) BLS, EBRC Benchmark

Total Nonfarm	383.0	383.8	384.7	383.8	375.1	2.1	1.2
Natural Resources and Mining	1.7	1.7	1.7	1.7	1.7	6.2	9.1
Construction	16.4	16.5	16.7	16.7	17.1	6.9	6.5
Manufacturing	24.4	24.2	24.5	24.5	25.0	2.9	2.6
Aerospace Products and Parts	12.4	12.4	12.5	12.5	13.0	7.4	5.7
Wholesale Trade	7.5	7.6	7.5	7.5	7.5	-2.6	-2.2
Retail Trade	41.7	42.0	42.1	42.8	42.6	1.4	-0.5
Transp., Warehousing, and Utilities	11.3	11.5	11.4	11.5	11.6	6.4	6.0
Information	5.4	5.3	5.4	5.4	5.4	1.9	0.3
Financial Activities	17.8	17.8	17.7	17.7	17.6	-0.6	1.5
Professional and Business Services	52.3	52.2	52.3	52.9	52.3	1.9	0.8
Educational and Health Services	66.2	66.3	66.6	66.3	66.4	2.6	0.9
Leisure and Hospitality	44.9	45.4	45.6	45.0	44.9	2.5	0.6
Accommodation	7.7	7.9	7.9	7.9	7.8	1.3	-2.4
Food Svcs and Drinking Places	33.2	33.9	34.2	33.7	33.8	7.6	3.1
Other Services	13.0	13.1	13.0	13.1	13.3	0.0	0.0
Federal Government	12.6	12.6	12.6	12.6	12.8	0.0	-0.4
State and Local Government	67.8	67.6	67.6	66.1	56.9	1.6	1.7
State and Local Govt Education	43.7	43.6	43.7	42.1	32.9	0.3	1.8

Sales (\$000s) ADOR

Aggregate Retail Sales	1,114,751	1,315,608	1,159,389	1,223,089	--	7.0	3.9
Retail	709,542	875,094	725,673	793,123	--	6.6	4.3
Food, EBRC	164,381	164,750	165,110	165,461	165,802	2.9	2.9
Restaurants & Bars	167,049	191,578	177,244	163,864	--	1.4	3.7
Gasoline, EBRC	73,778	84,186	91,362	100,641	--	31.0	3.4
Hotel/Motel	46,044	51,974	38,830	34,002	--	19.3	12.8

New Housing Units Authorized, Census C-40

Total Units	239	300	426	435	452	63.2	38.2
Single Family Units	232	293	324	312	321	18.0	31.3
2-4 Unit Structures	2	2	4	4	26	0.0	144.4
5-plus Unit Structures	5	5	98	119	105	2,000.0	111.8

Housing Sales and Prices, TAR

Total Sales (millions)	270,020	360,404	375,511	413,401	412,805	11.1	9.6
Total Units	1,084	1,462	1,452	1,581	1,593	4.3	1.6
Average Price (\$)	249,096	246,514	258,616	261,481	259,137	6.6	8.0

Tucson International Airport, TAA

Total Passengers	294,363	359,159	317,079	309,161	278,467	5.4	4.2
Total Aircraft Movements	11,257	13,349	11,834	11,306	10,474	4.2	-3.4

TABLE P.3

SELECTED ECONOMIC INDICATORS, TUCSON MSA

	2017	2018	2019	2020	2021	2022	2023	2024
INCOME								
Personal Income (\$ millions)	41,437	43,064	45,046	47,255	49,481	51,764	54,175	56,698
% change	3.1	3.9	4.6	4.9	4.7	4.6	4.7	4.7
Per Capita Personal Income (\$)	40,383	41,699	43,325	45,096	46,840	48,605	50,468	52,401
% change	1.8	3.3	3.9	4.1	3.9	3.8	3.8	3.8
Annual Earnings Per Worker (\$)	48,783	49,867	51,391	53,313	55,218	57,082	58,869	60,729
% change	2.0	2.2	3.1	3.7	3.6	3.4	3.1	3.2
Disposable Personal Income (\$mil)	37,215	38,699	40,531	42,537	44,536	46,579	48,736	50,996
% change	3.1	4.0	4.7	4.9	4.7	4.6	4.6	4.6
Real Per Capita Disposable Income (2010 dollars)	31,494	31,638	32,232	32,798	33,321	33,769	34,210	34,641
% change	-1.0	0.5	1.9	1.8	1.6	1.3	1.3	1.3
Disposable Income less Transfers (millions of 2010 dollars)	23,451	23,711	24,247	24,742	25,170	25,615	26,005	26,371
% change	0.2	1.1	2.3	2.0	1.7	1.8	1.5	1.4
SALES (\$ millions)								
Retail Sales (2010 dollars)	11,852	12,105	12,298	12,354	12,396	12,451	12,536	12,643
% change	1.6	2.1	1.6	0.5	0.3	0.4	0.7	0.9
Retail Sales (current dollars)	13,649	14,337	14,874	15,290	15,684	16,127	16,637	17,201
% change	4.5	5.0	3.7	2.8	2.6	2.8	3.2	3.4
Food Sales	1,935	1,991	2,031	2,091	2,160	2,217	2,276	2,341
% change	2.6	2.9	2.0	3.0	3.3	2.7	2.7	2.9
Retail Sales less Food	8,851	9,252	9,619	9,854	10,072	10,334	10,652	11,019
% change	3.4	4.5	4.0	2.4	2.2	2.6	3.1	3.4
Restaurant and Bar Sales	1,886	1,967	2,063	2,176	2,302	2,423	2,543	2,657
% change	4.2	4.3	4.9	5.5	5.8	5.2	5.0	4.5
Gasoline Sales	976	1,127	1,160	1,169	1,150	1,153	1,166	1,184
% change	21.0	15.5	3.0	0.7	-1.6	0.2	1.1	1.5
OTHER INDICATORS								
Population (000s)	1,026.1	1,032.7	1,039.7	1,047.9	1,056.4	1,065.0	1,073.4	1,082.0
% change	1.3	0.6	0.7	0.8	0.8	0.8	0.8	0.8
change	13.0	6.6	7.0	8.2	8.5	8.6	8.5	8.6
Nonfarm Employment	377.2	383.4	389.9	395.2	398.6	401.7	405.2	409.1
% change	1.5	1.6	1.7	1.4	0.9	0.8	0.9	1.0
change	5.4	6.1	6.5	5.3	3.4	3.1	3.5	3.9
Military Employment (000s)	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9
% change	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Residential Permits (units)	4,495	3,327	3,491	3,532	3,585	3,617	3,619	3,601
% change	82.3	-26.0	5.0	1.2	1.5	0.9	0.1	-0.5
Single Family	2,888	2,950	3,109	3,158	3,201	3,200	3,203	3,204
% change	19.3	2.1	5.4	1.6	1.4	0.0	0.1	0.0
Multi-Family	1,607	377	383	374	385	417	416	398
% change	3,393.5	-76.6	1.5	-2.2	2.8	8.3	0.0	-4.5
Gasoline Sales (mil of gals)	431.0	408.0	411.0	412.0	413.0	413.0	413.0	412.0
% change	8.1	-5.2	0.7	0.1	0.3	0.1	0.0	-0.2

TABLE P.4
EMPLOYMENT BY INDUSTRY, TUCSON MSA

	2017	2018	2019	2020	2021	2022	2023	2024
<i>Thousands</i>								
Nonfarm Employment	377.2	383.4	389.9	395.2	398.6	401.7	405.2	409.1
% change	1.5	1.6	1.7	1.4	0.9	0.8	0.9	1.0
Private Employment	300.0	305.5	311.8	316.7	320.8	324.0	327.5	331.2
% change	1.6	1.8	2.1	1.6	1.3	1.0	1.1	1.1
Goods-Producing	41.8	43.2	44.9	45.2	45.3	45.3	45.5	45.6
% change	4.5	3.5	3.7	0.8	0.3	0.1	0.4	0.1
Mining and Logging	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
% change	2.6	1.9	1.0	0.8	0.7	0.5	-0.1	-0.1
Construction	15.9	16.6	17.5	17.5	17.6	17.6	17.5	17.5
% change	5.7	4.7	5.1	0.4	0.5	-0.2	-0.2	-0.5
Manufacturing	24.2	24.9	25.7	25.9	26.0	26.0	26.2	26.4
% change	3.9	2.8	3.0	1.0	0.1	0.2	0.8	0.6
Aerospace Products and Parts	12.1	12.6	13.0	13.0	13.0	13.0	13.0	13.0
% change	6.8	3.8	3.2	0.0	0.0	0.0	0.0	0.0
Service Providing	335.5	340.1	345.0	350.0	353.3	356.4	359.7	363.5
% change	1.1	1.4	1.4	1.4	0.9	0.9	0.9	1.1
Trade, Transportation and Utilities	61.0	61.3	61.8	62.2	62.4	62.5	62.9	63.4
% change	0.9	0.5	0.8	0.5	0.3	0.3	0.5	0.8
Wholesale Trade	7.7	7.6	7.6	7.6	7.7	7.7	7.8	7.9
% change	-1.0	-1.7	0.6	-0.5	1.3	0.6	0.8	1.2
Retail Trade	42.3	42.2	42.6	42.9	43.0	43.1	43.4	43.8
% change	-0.2	-0.2	0.8	0.8	0.3	0.3	0.6	1.0
Food and Beverage	9.4	9.6	9.7	9.9	10.0	10.1	10.2	10.3
% change	2.9	2.0	1.1	1.3	1.2	1.0	1.0	1.1
Other Retail	32.9	32.6	32.8	33.0	33.0	33.1	33.2	33.5
% change	-1.1	-0.8	0.7	0.6	0.0	0.1	0.5	0.9
Transportation, Warehousing, and Utilities	11.0	11.6	11.7	11.7	11.7	11.7	11.7	11.7
% change	7.2	4.8	0.9	0.2	0.0	0.0	0.0	0.0
Information	5.3	5.4	5.5	5.8	6.1	6.0	5.9	5.8
% change	5.3	0.3	3.3	5.2	4.1	-0.9	-2.5	-1.6
Financial Activities	17.5	17.9	18.2	18.5	18.8	19.0	19.3	19.6
% change	1.9	2.3	1.3	1.6	1.6	1.4	1.4	1.4
Professional and Business Services	51.6	52.6	53.8	55.0	55.9	56.4	57.0	57.7
% change	1.2	2.0	2.1	2.2	1.7	1.0	1.0	1.2
Education and Health Services	65.2	66.5	67.9	69.3	70.7	72.2	73.6	75.1
% change	0.7	2.1	2.0	2.1	2.1	2.1	2.0	2.0
Leisure and Hospitality	44.6	45.4	46.7	47.6	48.4	49.1	49.9	50.6
% change	1.2	1.8	2.8	2.1	1.6	1.5	1.5	1.6
Art, Entertainment, and Recreation	4.8	4.8	4.9	4.9	4.8	4.8	4.7	4.7
% change	0.0	0.2	1.2	-0.6	-1.2	-1.0	-0.5	-0.1
Accommodation	7.8	7.8	7.9	8.0	7.9	7.9	8.0	8.0
% change	-0.5	0.5	1.9	0.2	-0.3	-0.1	0.3	0.8
Food Services and Drinking Places	32.0	32.8	33.8	34.8	35.6	36.4	37.2	37.9
% change	1.9	2.4	3.2	2.9	2.4	2.2	2.1	1.9
Other Services	13.0	13.1	13.1	13.2	13.3	13.3	13.4	13.5
% change	0.3	0.4	0.4	0.5	0.5	0.5	0.5	0.5
Government	77.2	77.9	78.1	78.5	77.9	77.7	77.8	77.9
% change	1.1	0.8	0.3	0.6	-0.8	-0.2	0.0	0.2
Federal	12.7	12.7	12.8	13.3	12.8	12.8	12.8	12.8
% change	0.2	0.1	0.2	4.0	-3.6	0.0	0.0	0.0
State and Local	64.5	65.1	65.3	65.2	65.1	64.9	64.9	65.1
% change	1.2	1.0	0.3	-0.1	-0.3	-0.2	0.0	0.2
State and Local Education	40.7	40.9	40.7	40.5	40.3	40.2	40.1	40.0
% change	1.2	0.5	-0.5	-0.4	-0.4	-0.4	-0.3	-0.1
State and Local Excluding Education	23.8	24.2	24.6	24.7	24.7	24.8	24.9	25.1
% change	1.3	1.8	1.7	0.4	0.0	0.1	0.5	0.8

TABLE P.5
POPULATION AND COMPONENTS OF CHANGE, TUCSON MSA

	2017	2018	2019	2020	2021	2022	2023	2024
<i>Thousands</i>								
Population (midyear)	1,026.1	1,032.7	1,039.7	1,047.9	1,056.4	1,065.0	1,073.4	1,082.0
% change	1.3	0.6	0.7	0.8	0.8	0.8	0.8	0.8
change	13.0	6.6	7.0	8.2	8.5	8.6	8.5	8.6
DERIVATION:								
Population, previous year	1,013.1	1,026.1	1,032.7	1,039.7	1,047.9	1,056.4	1,065.0	1,073.4
plus:								
Natural Increase	1.8	2.2	2.3	2.5	2.6	2.6	2.6	2.6
equal to:								
Births	11.2	11.5	11.6	11.9	12.1	12.2	12.4	12.5
minus:								
Deaths	9.4	9.3	9.3	9.4	9.5	9.6	9.7	9.9
plus:								
Net Migration	11.1	4.4	4.7	5.7	5.9	6.0	5.8	5.9
RATES OF CHANGE:								
<i>Percent Change from Prior Year</i>								
Natural Increase	2.6	17.5	3.9	9.7	4.1	0.8	1.3	-0.8
Births	-0.3	2.4	0.7	2.3	1.6	1.3	1.3	0.8
Deaths	-0.8	-0.5	0.0	0.5	1.0	1.4	1.3	1.3
Net Migration	477.6	-60.2	6.8	19.7	4.4	1.4	-3.2	2.2
ADDENDUM:								
<i>Number per 1,000 Persons</i>								
Birth Rate	11.0	11.1	11.2	11.3	11.4	11.5	11.5	11.5
Death Rate	9.1	9.0	9.0	9.0	9.0	9.0	9.1	9.1
Migration Rate, net	10.9	4.3	4.6	5.4	5.6	5.6	5.4	5.5

TABLE P.6
PERSONAL INCOME BY SOURCE, TUCSON MSA

	2017	2018	2019	2020	2021	2022	2023	2024
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\$ Millions, Seasonally Adjusted Annual Rate

Total Personal Income	41,437	43,064	45,046	47,255	49,481	51,764	54,175	56,698
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DERIVATION:

Earnings	25,057	26,090	27,281	28,562	29,745	30,977	32,245	33,601
less: Contr. to Social Insurance	3,038	3,218	3,348	3,497	3,647	3,812	3,986	4,177
plus: Residence Adjustment	-32	-47	-64	-82	-99	-117	-135	-155
plus: Dividends, Interest & Rent	9,241	9,623	9,970	10,358	10,793	11,312	11,827	12,312
plus: Transfer Payments	10,209	10,615	11,206	11,914	12,689	13,404	14,224	15,117

COMPONENTS OF EARNINGS:

Private	18,862	19,712	20,749	21,865	22,904	23,949	25,010	26,136
Federal Government, Civilian	1,406	1,442	1,485	1,553	1,590	1,643	1,698	1,755
Federal Government, Military	602	605	608	611	614	617	620	623
State & Local Government	4,187	4,332	4,440	4,532	4,637	4,767	4,916	5,086

Percent Change from Prior Year

Total Personal Income	3.1	3.9	4.6	4.9	4.7	4.6	4.7	4.7
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DERIVATION:

Earnings	3.3	4.1	4.6	4.7	4.1	4.1	4.1	4.2
less: Contr. to Social Insurance	5.5	5.9	4.0	4.5	4.3	4.5	4.6	4.8
plus: Residence Adjustment	57.2	46.9	36.8	28.9	20.7	17.9	15.6	14.4
plus: Dividends, Interest & Rent	3.3	4.1	3.6	3.9	4.2	4.8	4.6	4.1
plus: Transfer Payments	3.3	4.0	5.6	6.3	6.5	5.6	6.1	6.3

COMPONENTS OF EARNINGS:

Private	3.6	4.5	5.3	5.4	4.8	4.6	4.4	4.5
Federal Government, Civilian	1.9	2.5	3.0	4.6	2.4	3.4	3.3	3.3
Federal Government, Military	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5
State & Local Government	2.9	3.5	2.5	2.1	2.3	2.8	3.1	3.5

TABLE P.7
EARNINGS AND PRICES, TUCSON MSA

	2017	2018	2019	2020	2021	2022	2023	2024
TUCSON, MA								
	<i>Current Dollars</i>							
Aggregate Earnings	48,783	49,867	51,391	53,313	55,218	57,082	58,869	60,729
Private	62,867	64,520	66,546	69,044	71,407	73,922	76,374	78,911
Federal Government, Civilian	110,417	113,089	116,251	116,952	124,204	128,369	132,660	137,066
Federal Government, Military	76,108	76,508	76,890	77,275	77,661	78,049	78,439	78,832
State & Local Government	64,951	66,540	67,980	69,473	71,262	73,408	75,694	78,120
	<i>Percent Change from Prior Year</i>							
Aggregate Earnings	2.0	2.2	3.1	3.7	3.6	3.4	3.1	3.2
Private	2.0	2.6	3.1	3.8	3.4	3.5	3.3	3.3
Federal Government, Civilian	1.7	2.4	2.8	0.6	6.2	3.4	3.3	3.3
Federal Government, Military	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5
State & Local Government	1.7	2.4	2.2	2.2	2.6	3.0	3.1	3.2
U.S. (Nonfarm)								
Employment Cost Index, Private	2.5	3.3	3.4	3.6	3.9	3.9	3.9	3.8
Productivity, Business Sector	1.3	1.5	1.4	1.2	1.4	1.8	1.8	1.7
Unit Labor Costs, Business Sector	0.4	1.2	1.8	2.7	2.6	2.2	2.2	2.1
PRICES (% change)								
CPI, Western Region	2.8	2.8	2.1	2.3	2.2	2.4	2.5	2.5
CPI, All Urban, U.S.	2.1	2.6	2.1	2.3	2.2	2.3	2.4	2.5
GDP Deflator, (Chained) U.S.	1.8	2.2	2.7	2.7	2.6	2.4	2.3	2.3
Personal Consumption Deflator	1.7	2.2	2.1	2.2	2.2	2.2	2.3	2.3
Unleaded Gasoline Price, PHX (\$)								
(% ch.)	11.9	21.8	2.3	0.6	-1.9	0.1	1.1	1.8

TABLE P.8
ALTERNATIVE SCENARIOS, TUCSON MSA

	2017	2018	2019	2020	2021	2022	2023	2024
Personal Income								
	<i>Percent Change</i>							
High	3.1	4.9	5.6	6.3	5.3	4.9	4.8	5.2
Base	3.1	3.9	4.6	4.9	4.7	4.6	4.7	4.7
Low	3.1	3.2	3.5	3.2	4.6	5.1	5.0	5.0
Population								
High	1.3	1.0	0.9	1.1	1.0	1.0	0.9	1.0
Base	1.3	0.6	0.7	0.8	0.8	0.8	0.8	0.8
Low	1.3	0.4	0.3	0.4	0.6	0.9	0.8	0.8
Nonfarm Employment								
High	1.5	2.4	2.4	2.4	1.2	0.9	0.9	1.2
Base	1.5	1.6	1.7	1.4	0.9	0.8	0.9	1.0
Low	1.5	0.9	0.5	0.1	0.7	1.2	1.2	1.1
Manufacturing Employment								
High	3.9	7.6	4.4	1.5	-0.3	-0.4	0.4	0.4
Base	3.9	2.8	3.0	1.0	0.1	0.2	0.8	0.6
Low	3.9	-2.0	0.2	0.8	0.9	1.4	1.2	0.6
Construction Employment								
High	5.7	8.1	6.1	6.0	-1.8	0.3	-3.5	-0.4
Base	5.7	4.7	5.1	0.4	0.5	-0.2	-0.2	-0.5
Low	5.7	2.0	3.0	-4.7	1.4	2.5	4.1	2.3
Housing Permits								
High	82.3	-1.4	-3.8	9.6	-10.9	-1.7	-4.7	7.5
Base	82.3	-26.0	5.0	1.2	1.5	0.9	0.1	-0.5
Low	82.3	-45.9	0.9	-1.4	26.2	21.6	0.5	-4.7
Retail Sales								
High	4.5	6.0	4.6	4.1	3.1	3.3	3.5	4.0
Base	4.5	5.0	3.7	2.8	2.6	2.8	3.2	3.4
Low	4.5	4.4	2.6	1.4	2.5	3.3	3.5	3.7
Avg. Earnings								
High	2.0	2.6	3.6	4.1	3.9	3.6	3.2	3.2
Base	2.0	2.2	3.1	3.7	3.6	3.4	3.1	3.2
Low	2.0	2.1	3.0	3.5	3.1	3.3	3.2	3.3

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Figure 14	Financial Activities Employment; Prof. & Bus. Services Employment; Edu.& Health Services Employment w/ Forecast—Arizona		

FIGURE 1

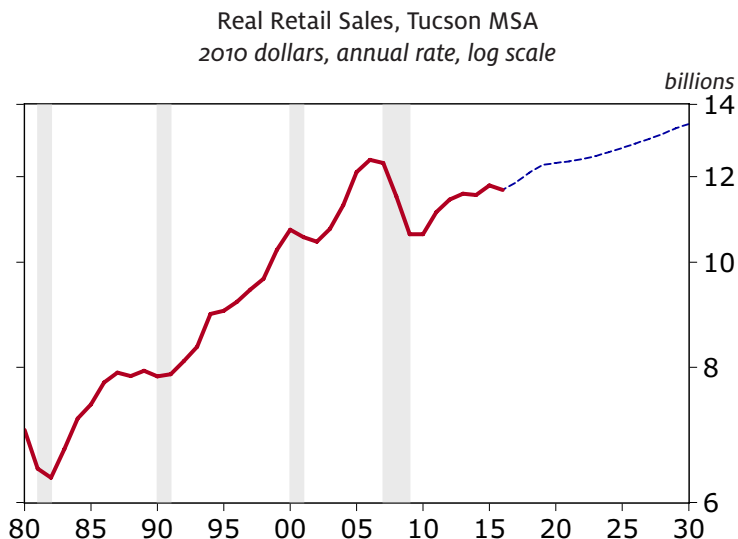
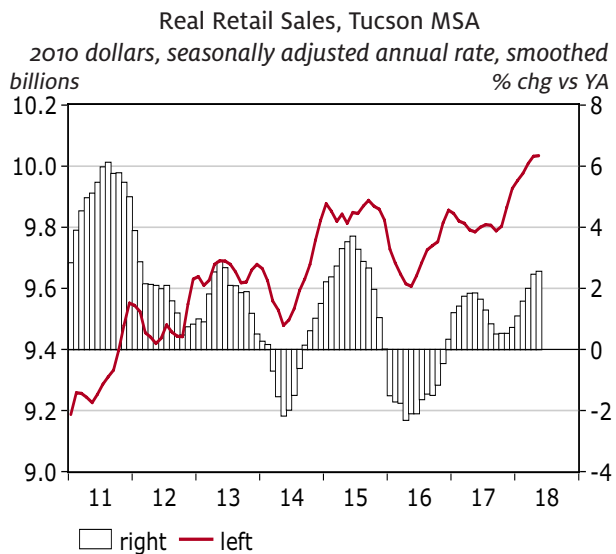
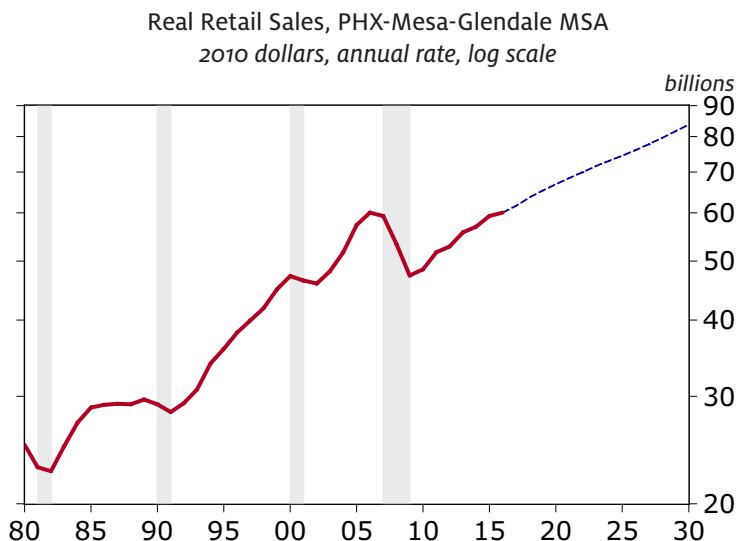
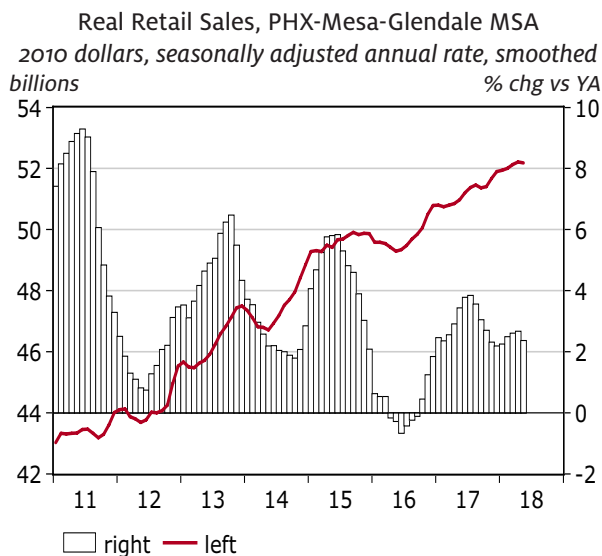
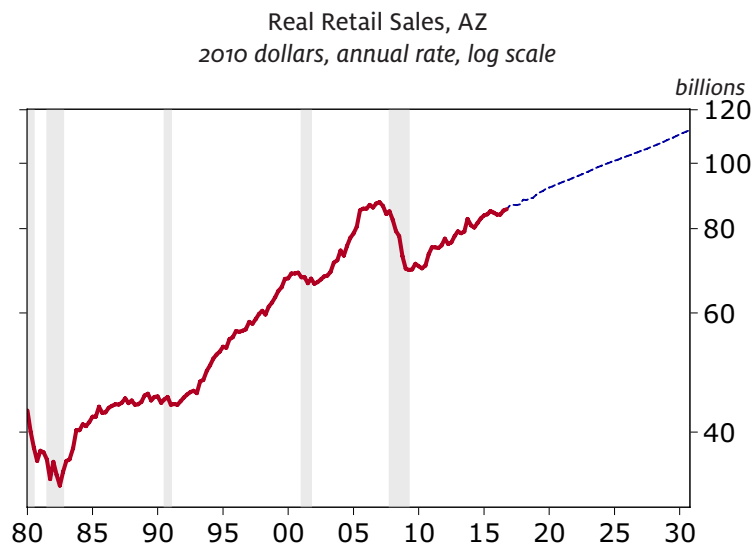
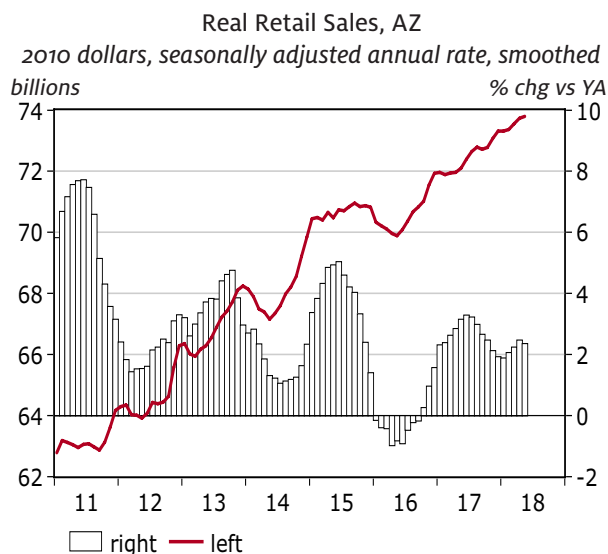


FIGURE 2

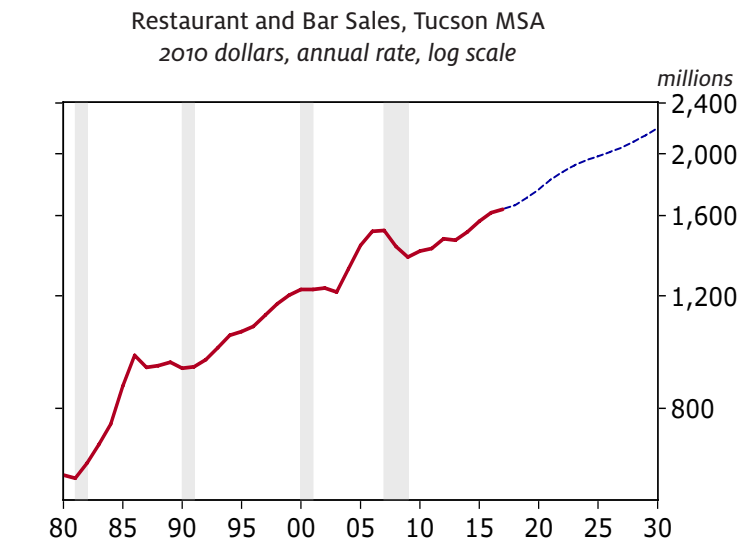
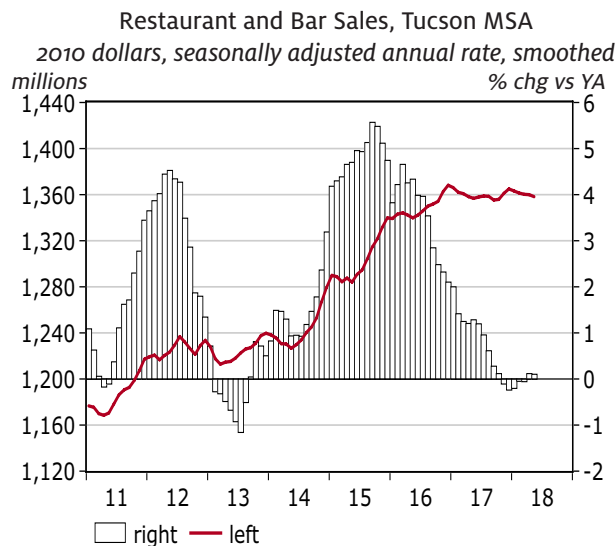
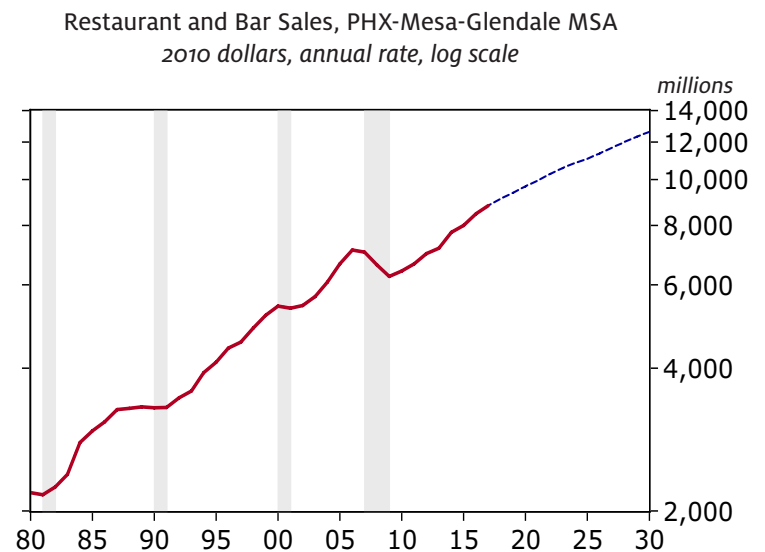
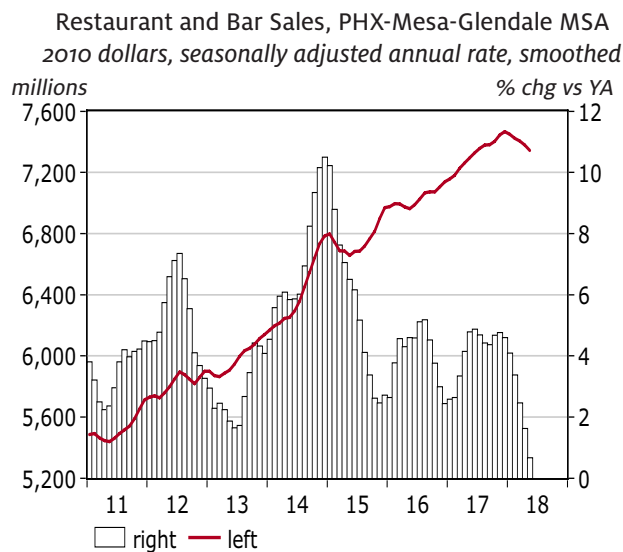
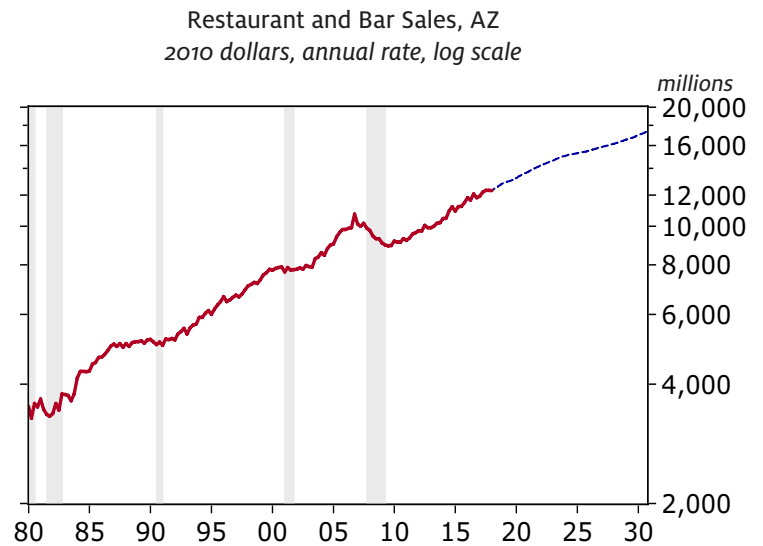
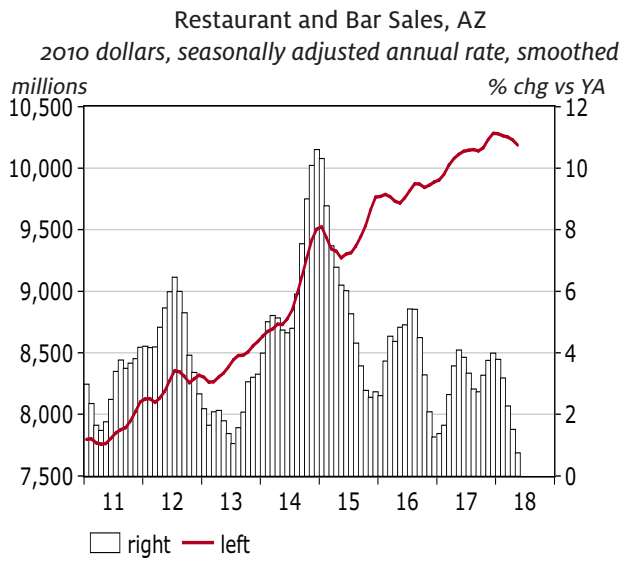


FIGURE 3

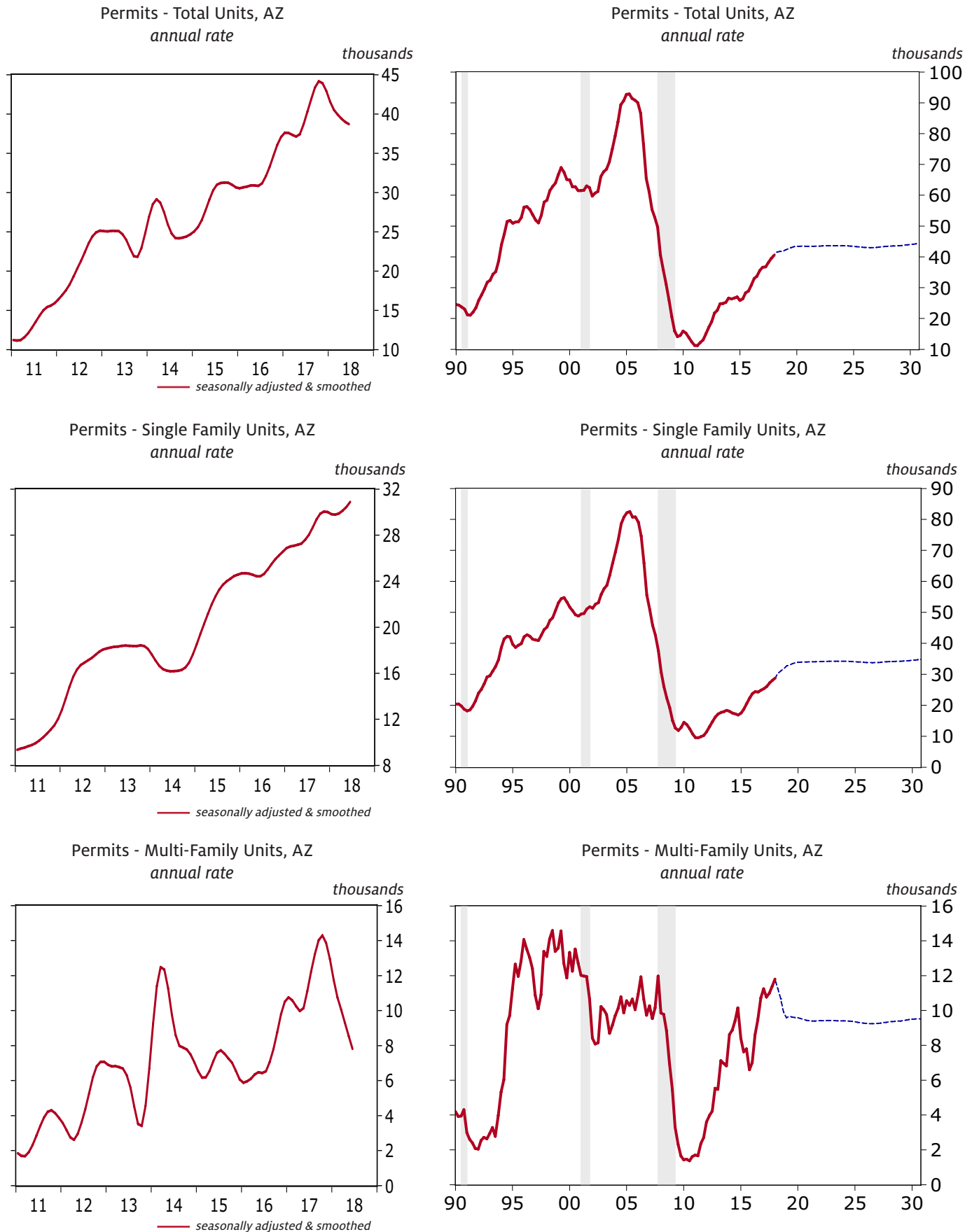
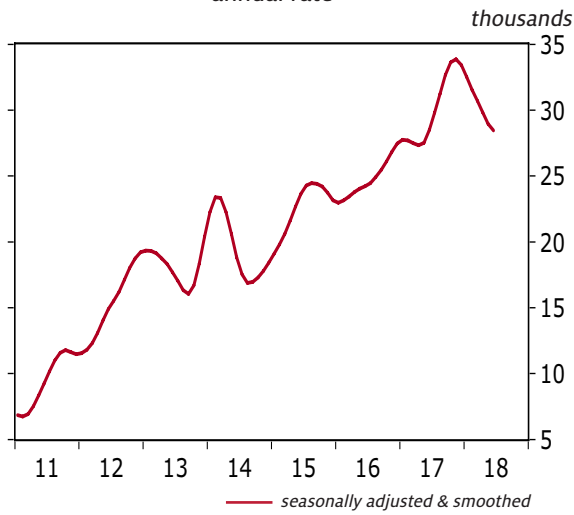
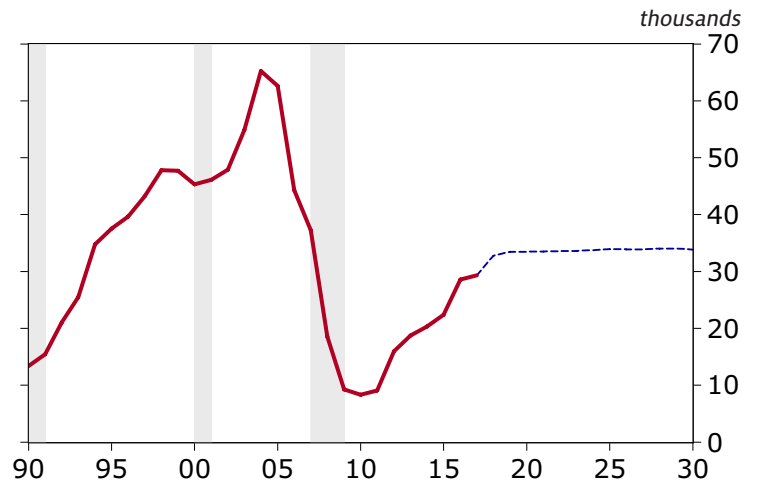


FIGURE 4

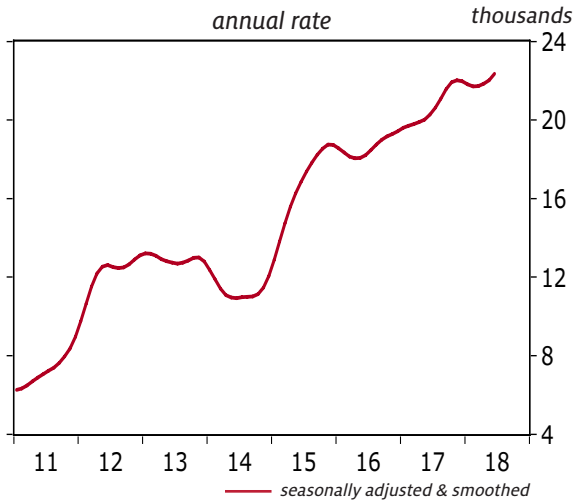
Permits - Total Units, PHX-Mesa-Glendale MSA
annual rate



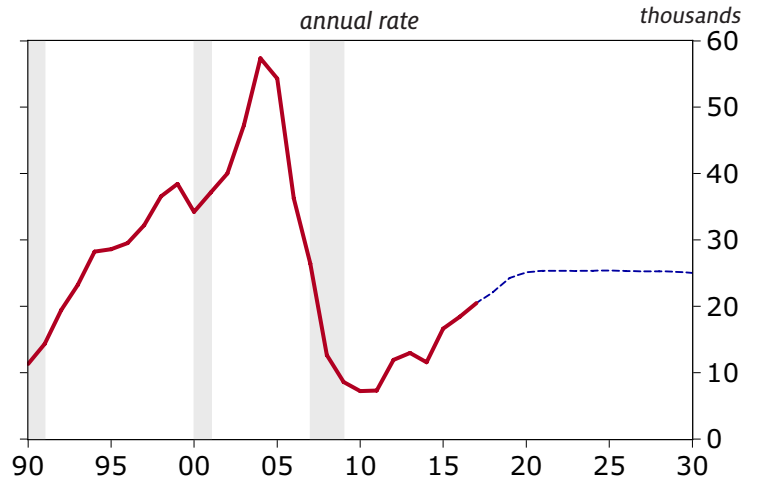
Permits - Total Units, PHX-Mesa-Glendale MSA
annual rate



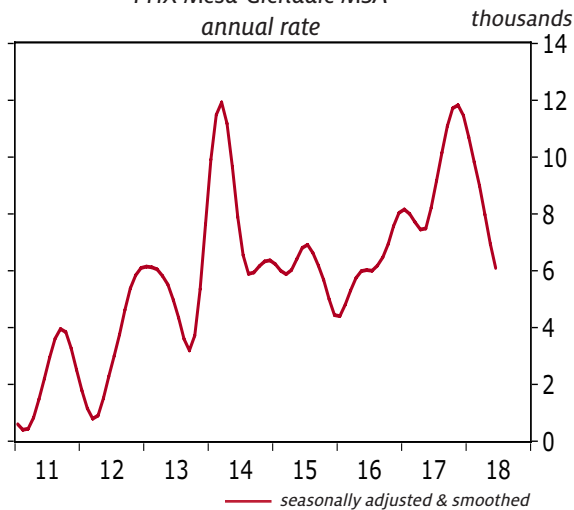
Permits - Single Family Units
PHX-Mesa-Glendale MSA
annual rate



Permits - Single Family Units
PHX-Mesa-Glendale MSA
annual rate



Permits - Multi-Family Units
PHX-Mesa-Glendale MSA
annual rate



Permits - Multi-Family Units
PHX-Mesa-Glendale MSA
annual rate

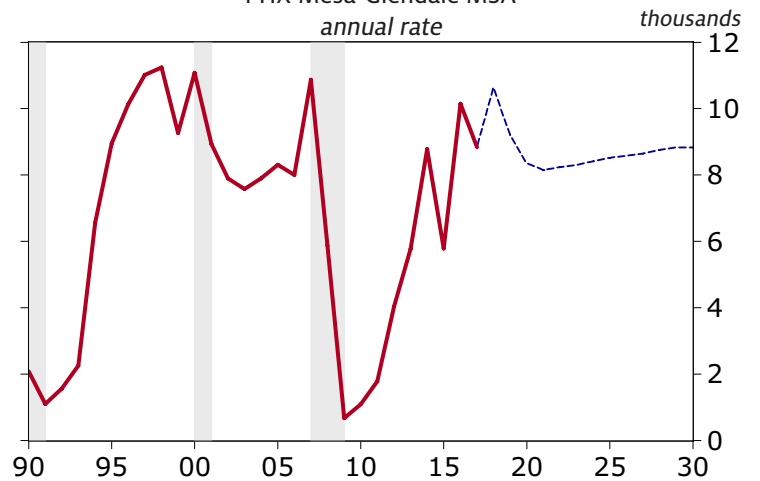


FIGURE 5

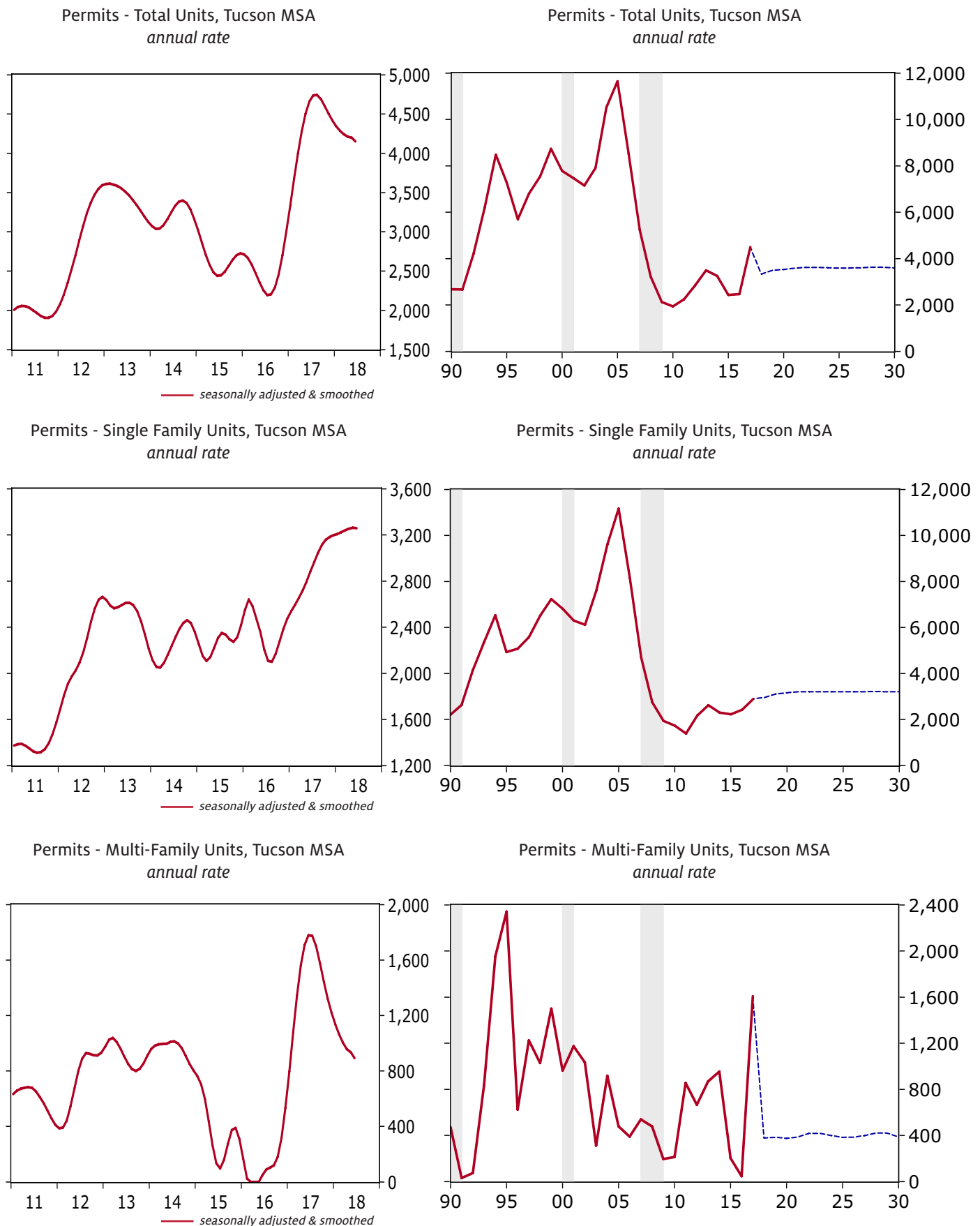
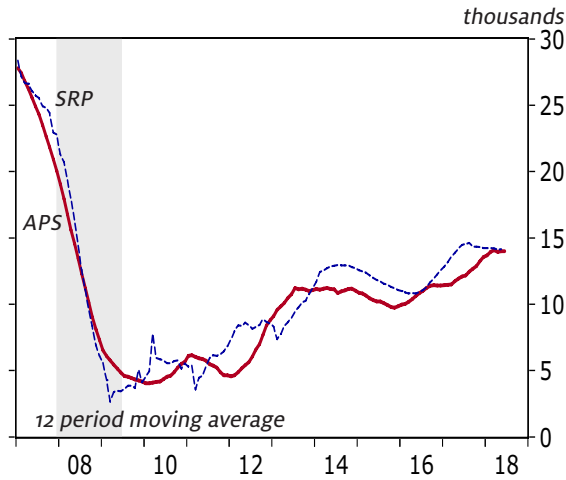
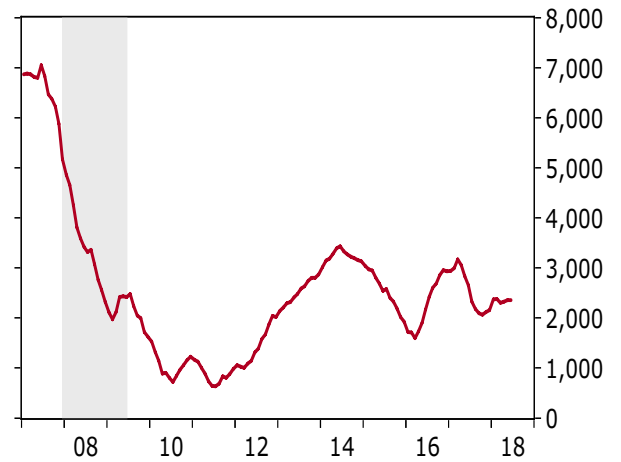


FIGURE 6

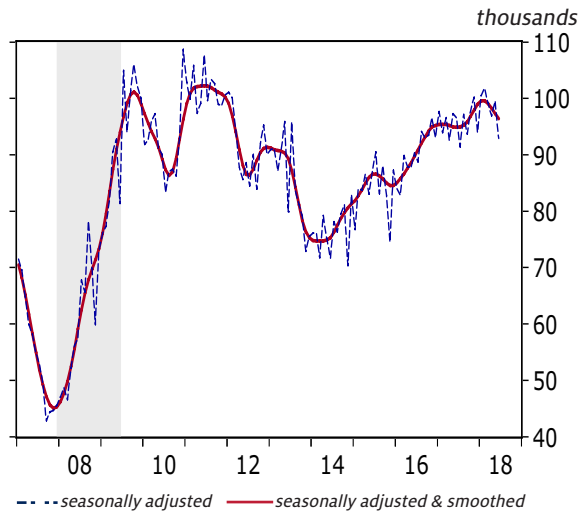
Residential Electrical Customers
APS and SRP Service Areas in Maricopa Co.
increase from a year ago, smoothed



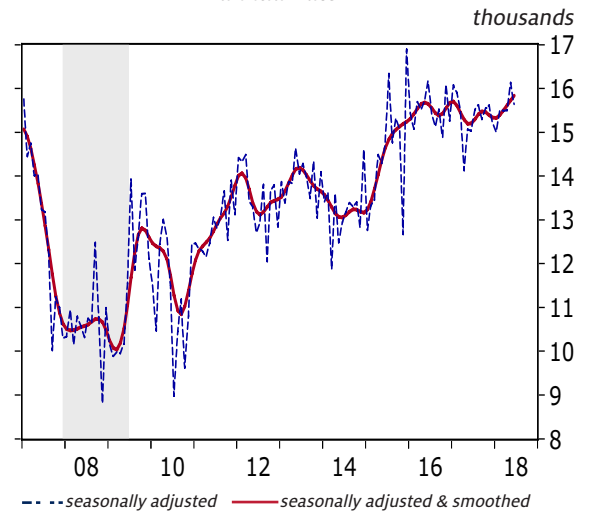
Residential Electrical Customers
Tucson Electric Power Service Area
increase from a year ago, smoothed



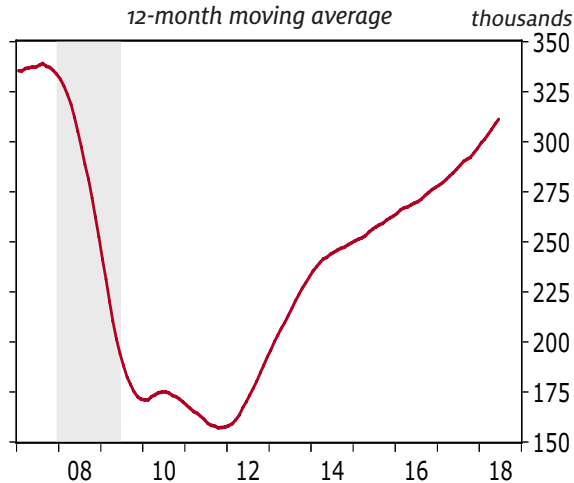
Multiple Unit Listing Sales, PHX-Mesa-Glendale MSA
annual rate



Multiple Unit Listing Sales, Tucson MSA
annual rate



Average Price of Resale Housing
PHX-Mesa-Glendale MSA
12-month moving average



Average Price of Resale Housing, Tucson MSA
12-month moving average

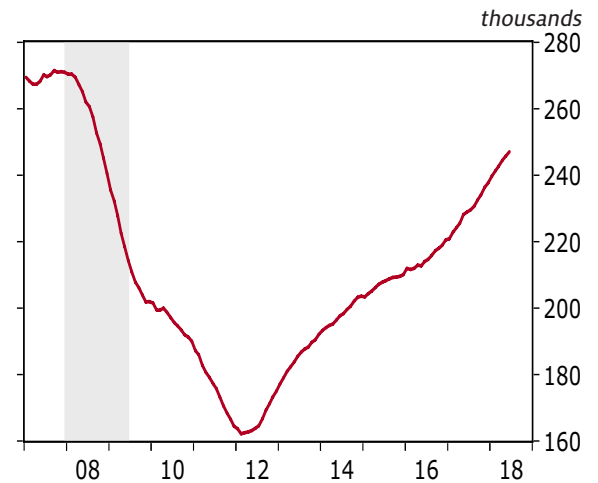


FIGURE 7

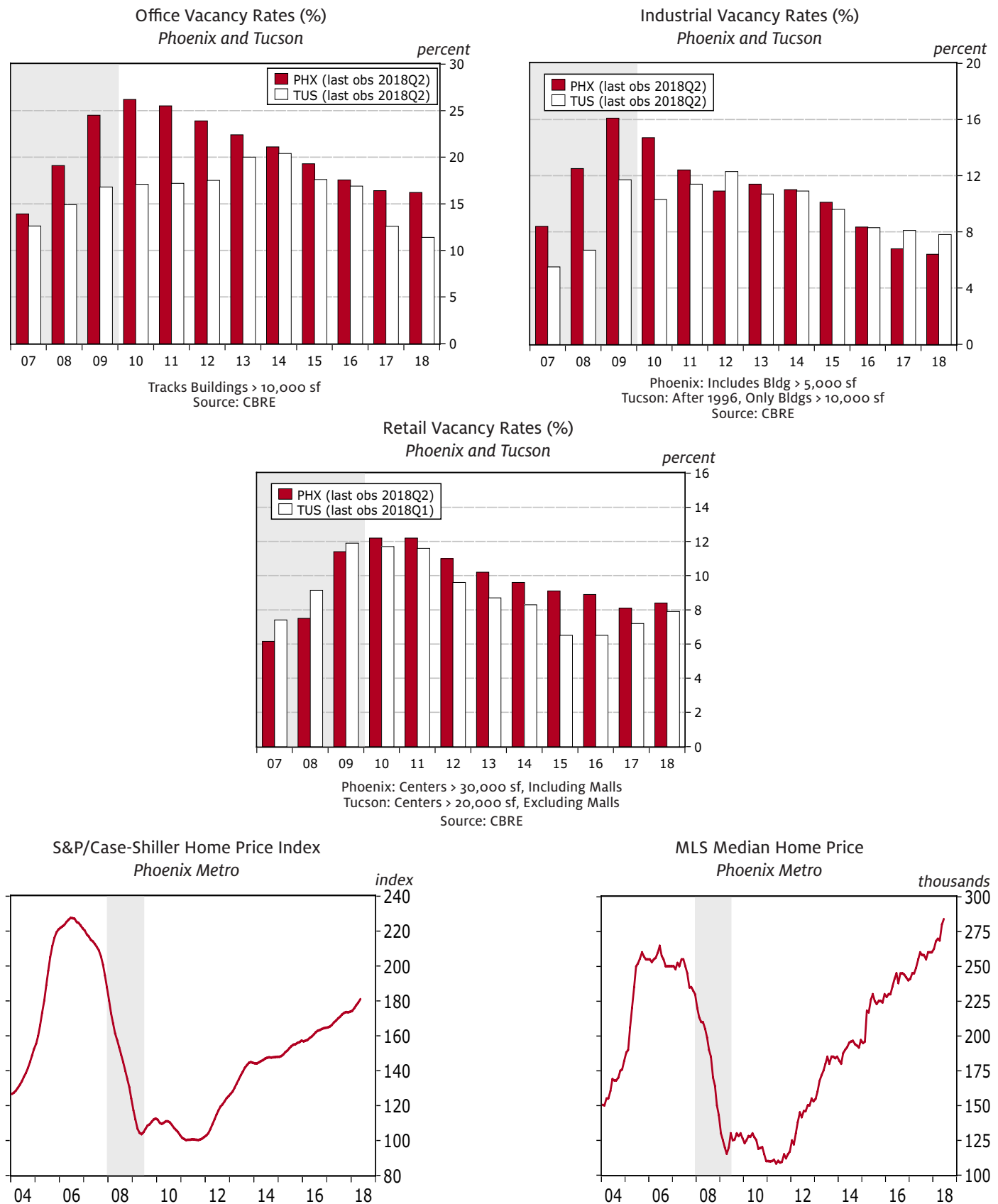
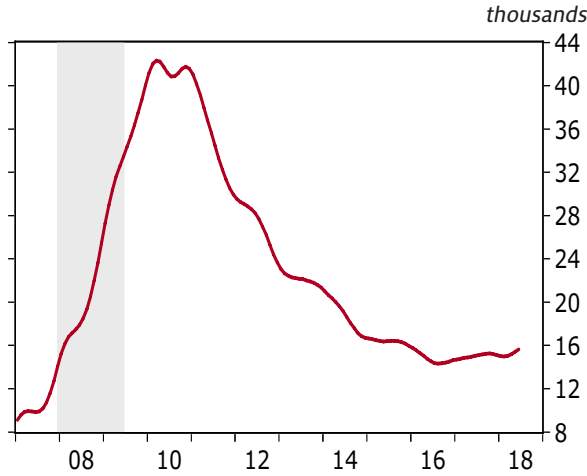
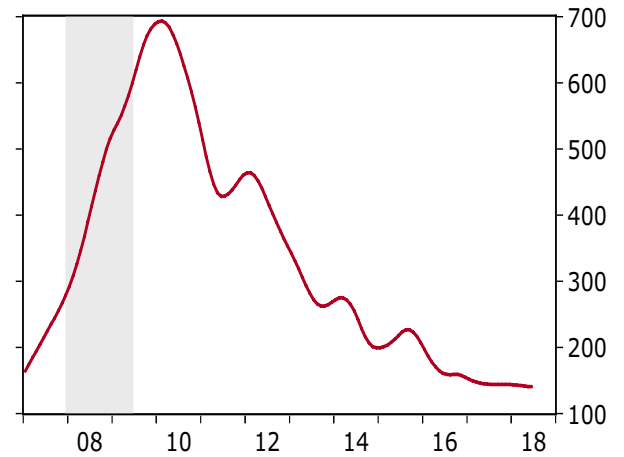


FIGURE 8

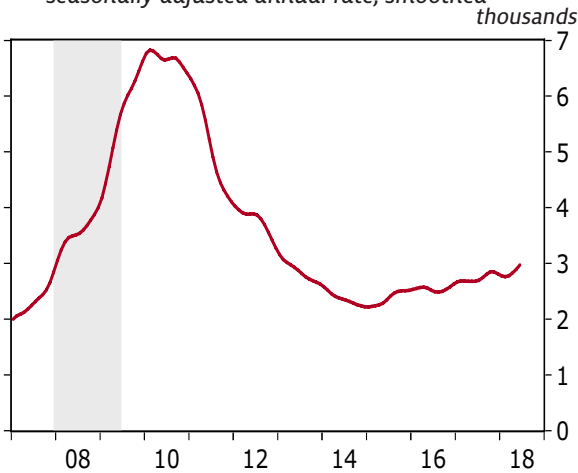
Total Bankruptcies, AZ
seasonally adjusted annual rate, smoothed



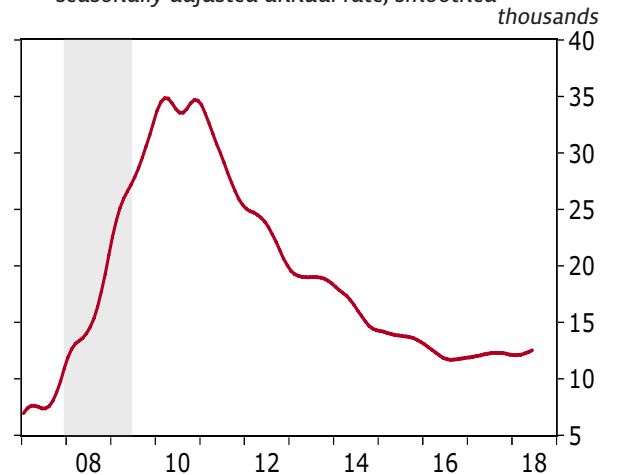
Business Reorganizations Under Chapter 11, AZ
seasonally adjusted annual rate, smoothed



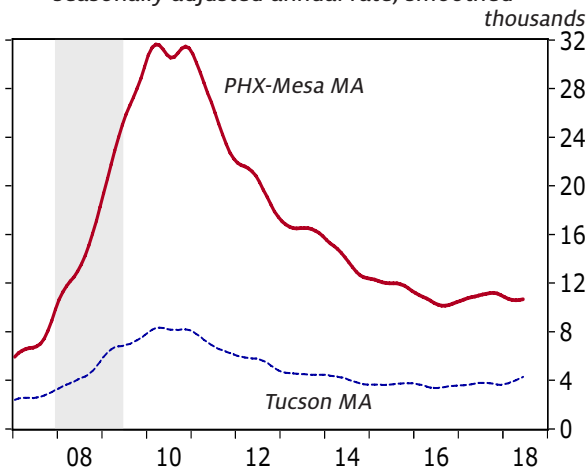
Personal Reorganizations
Under Chapter 13, AZ
seasonally adjusted annual rate, smoothed



Individual & Business Liquidations
Under Chapter 7, AZ
seasonally adjusted annual rate, smoothed



Total Bankruptcies
seasonally adjusted annual rate, smoothed



Individual & Business Liquidations Under Chapter 7
seasonally adjusted annual rate, smoothed

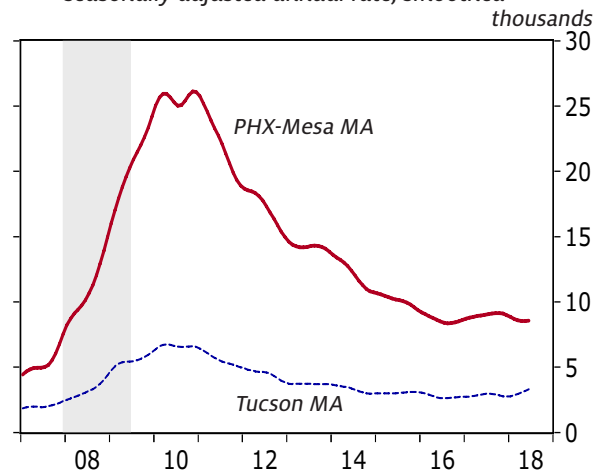


FIGURE 9

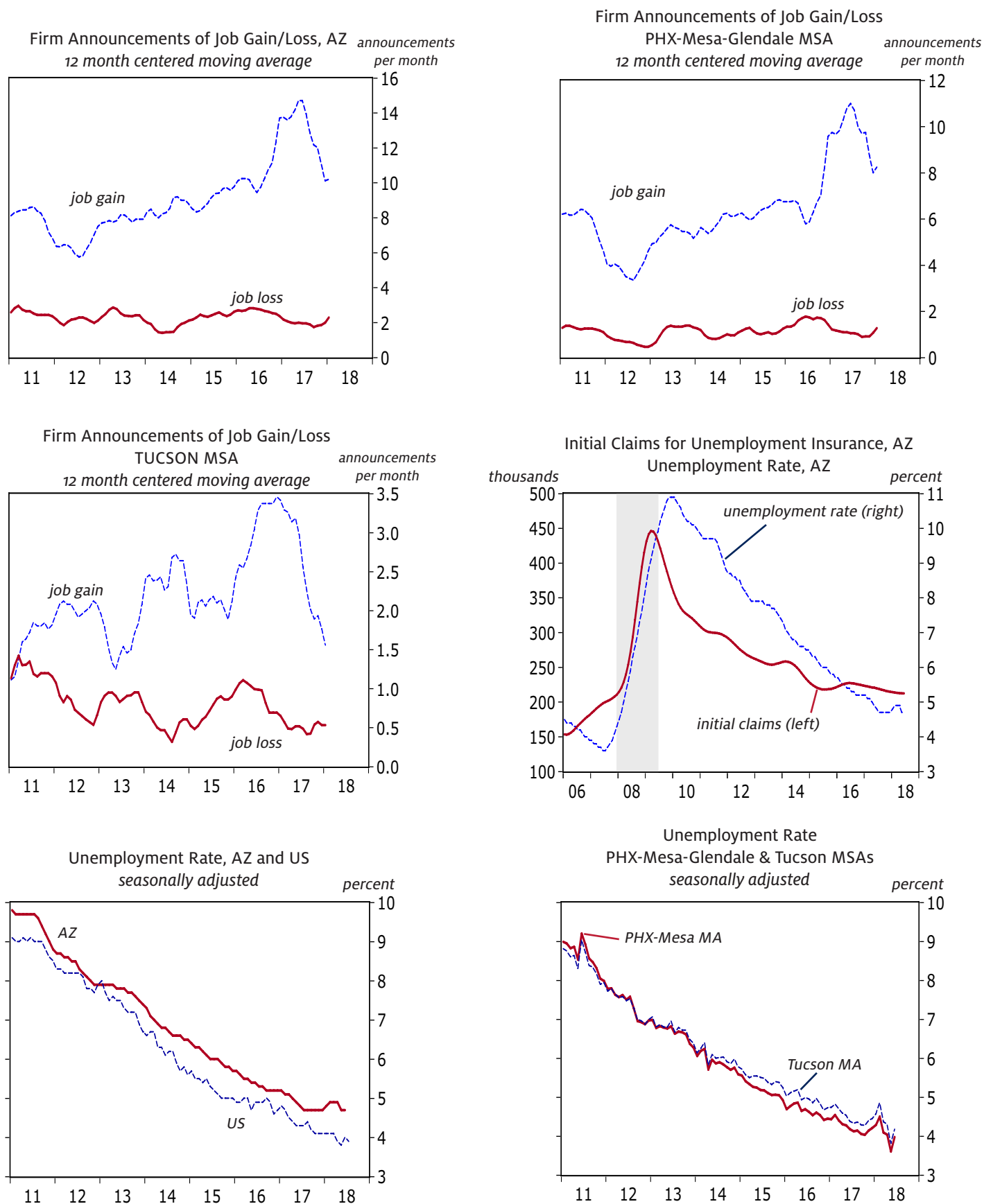


FIGURE 10

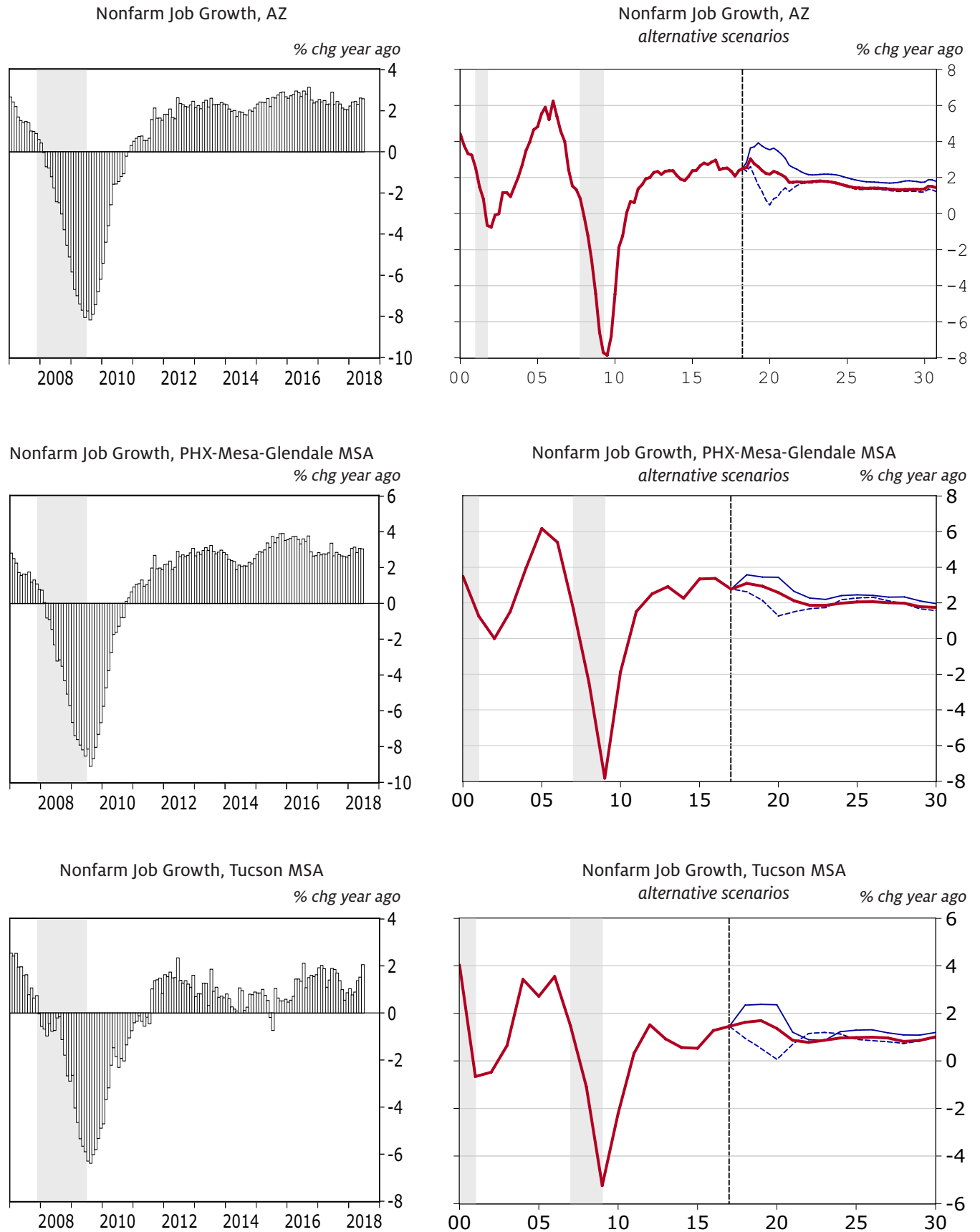


FIGURE 11

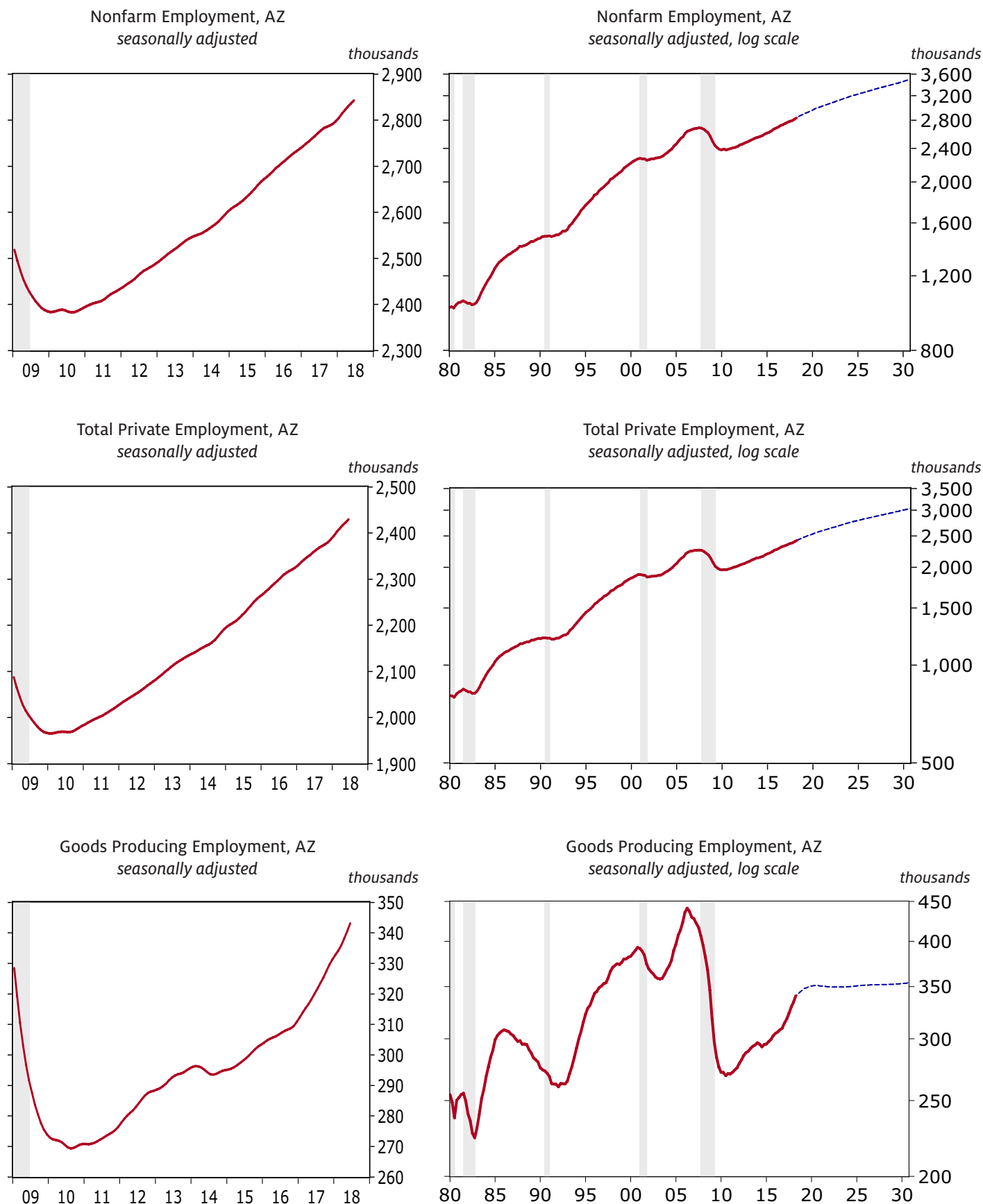


FIGURE 12

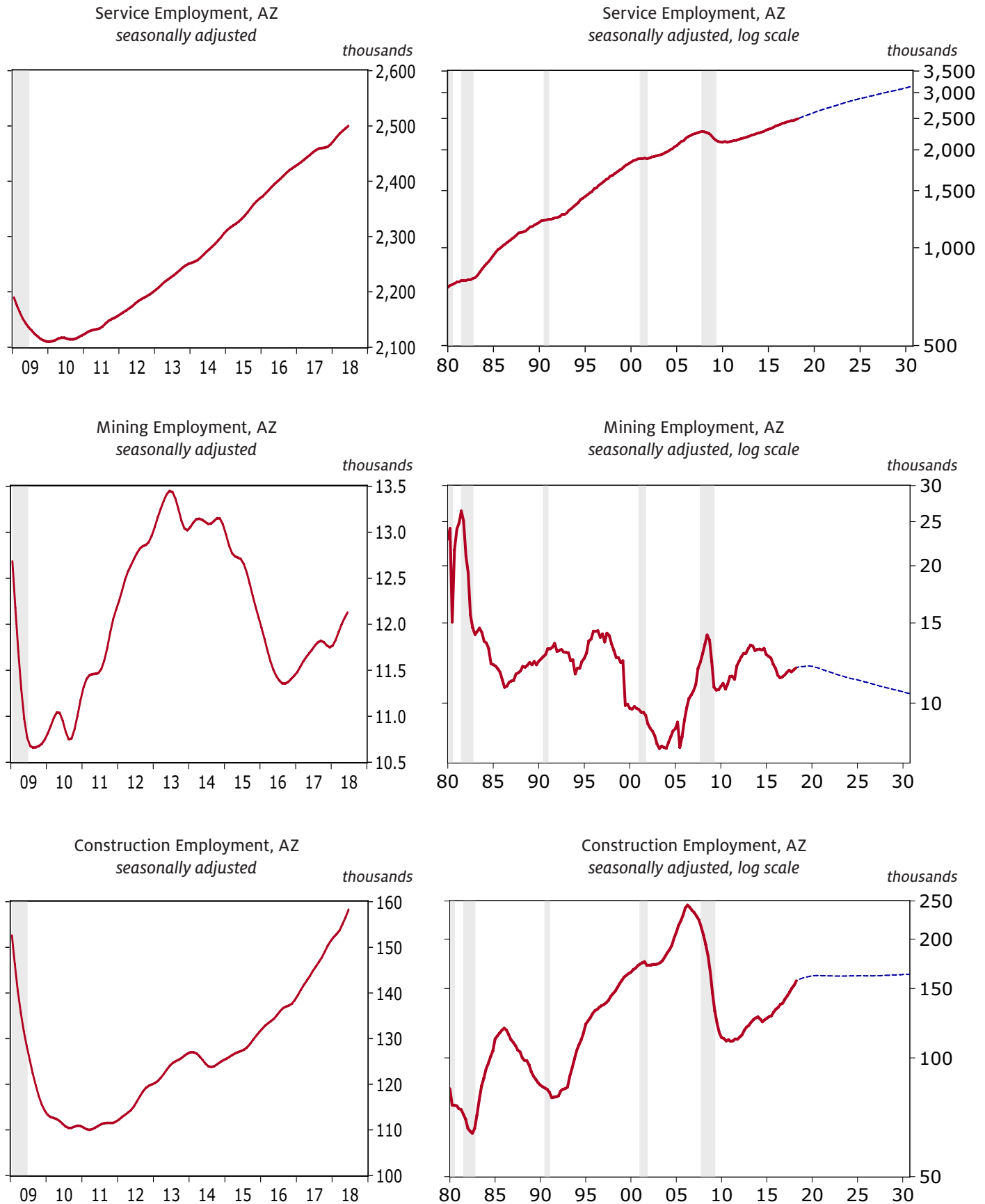


FIGURE 13

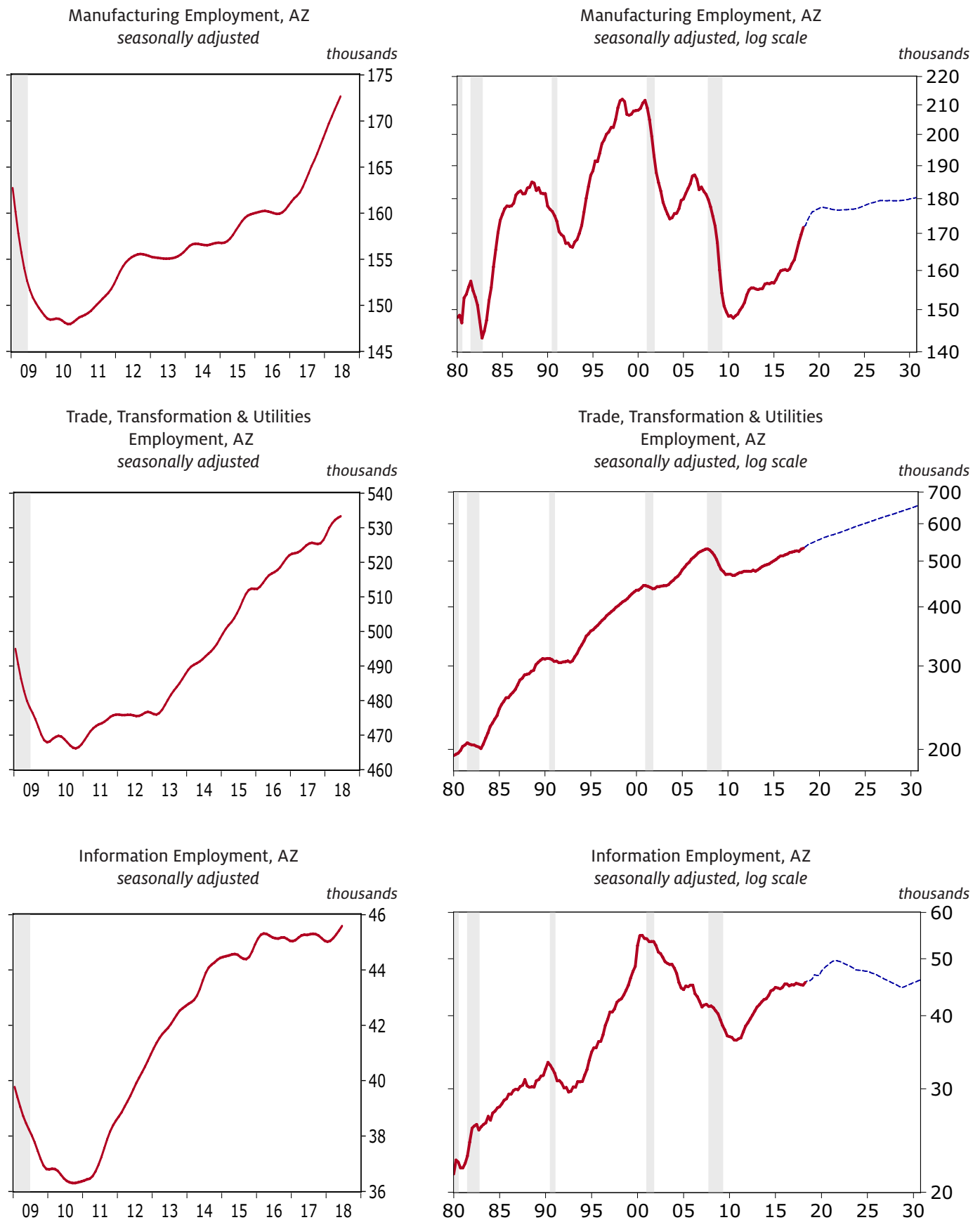


FIGURE 14

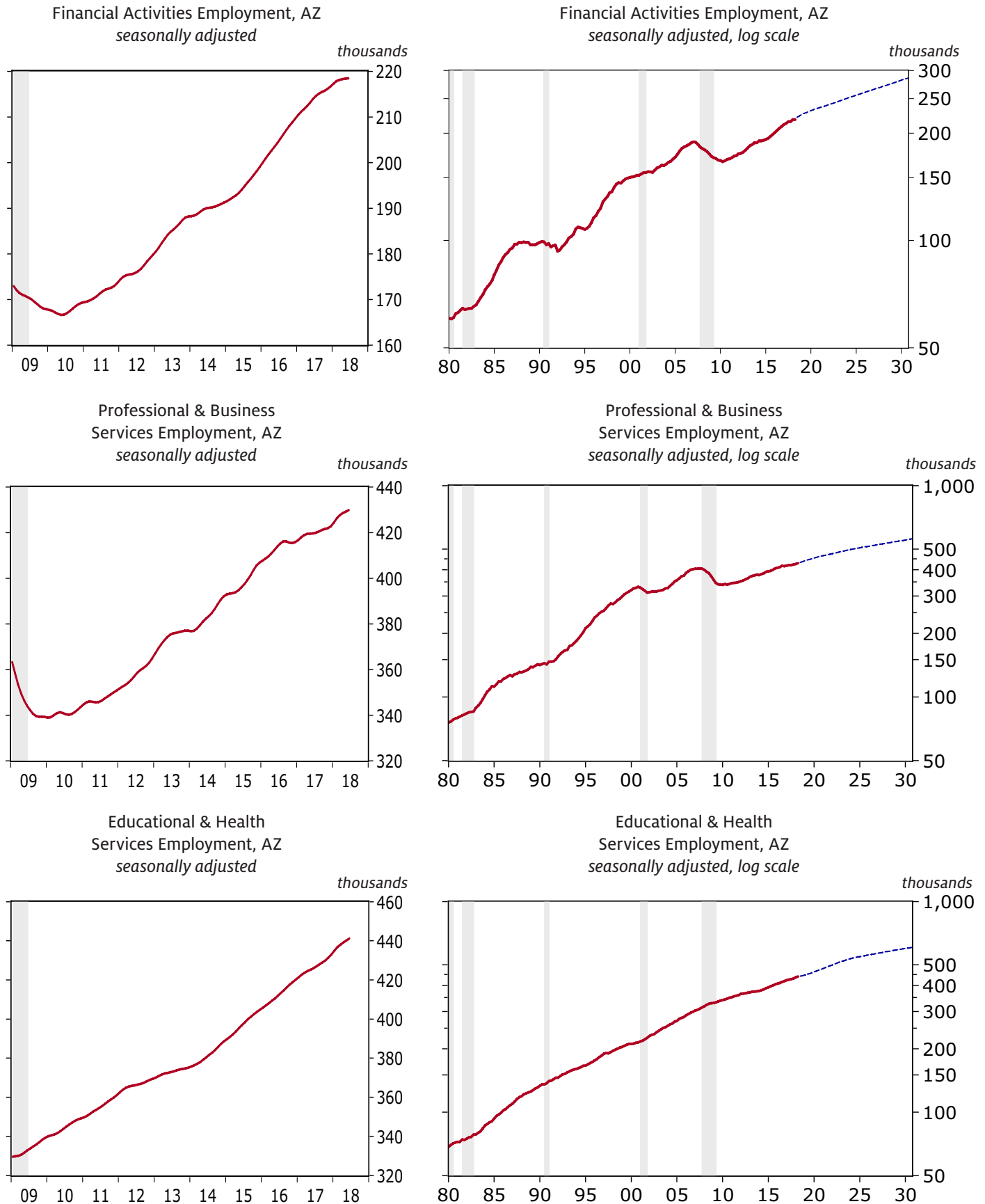


FIGURE 15

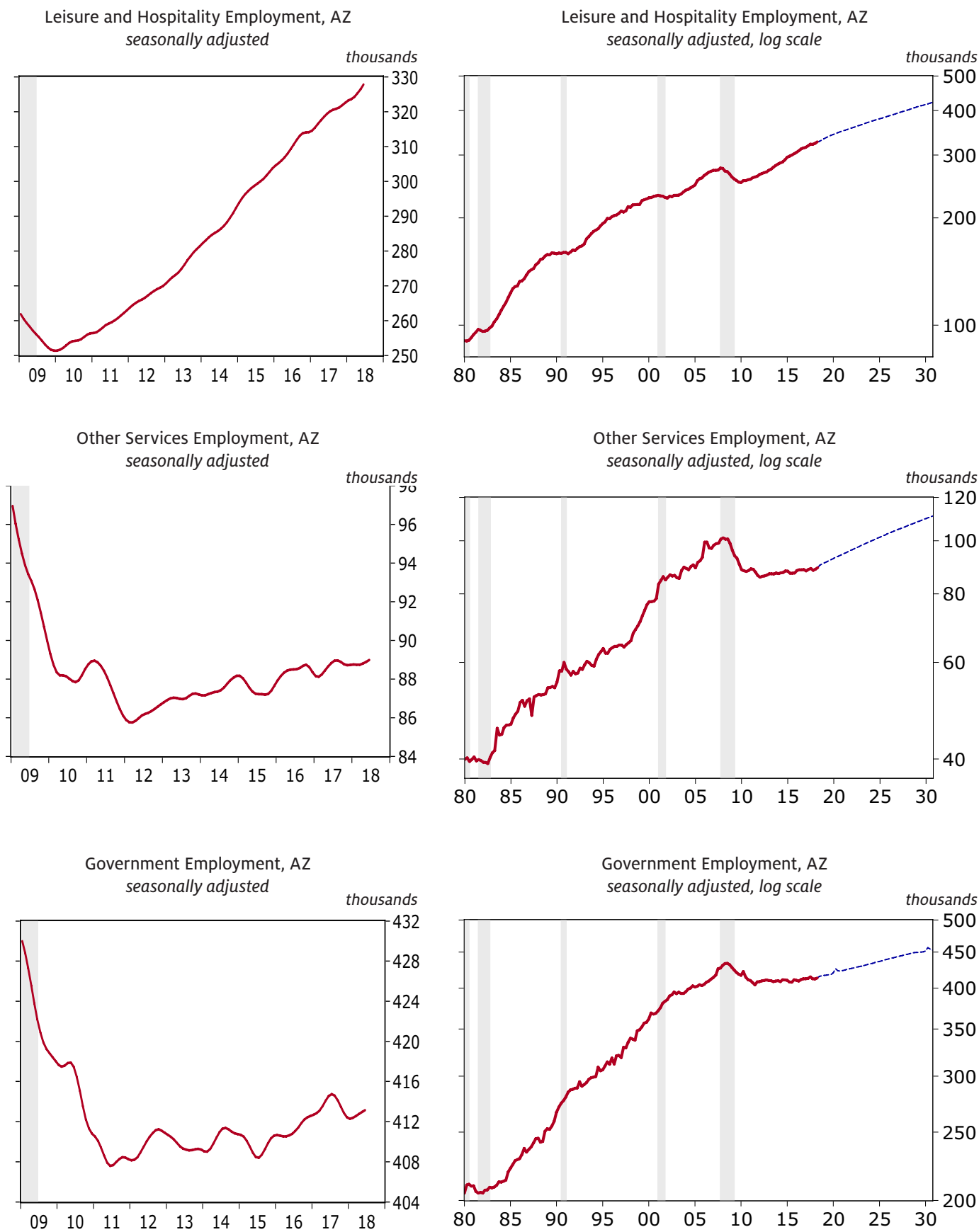


FIGURE 16

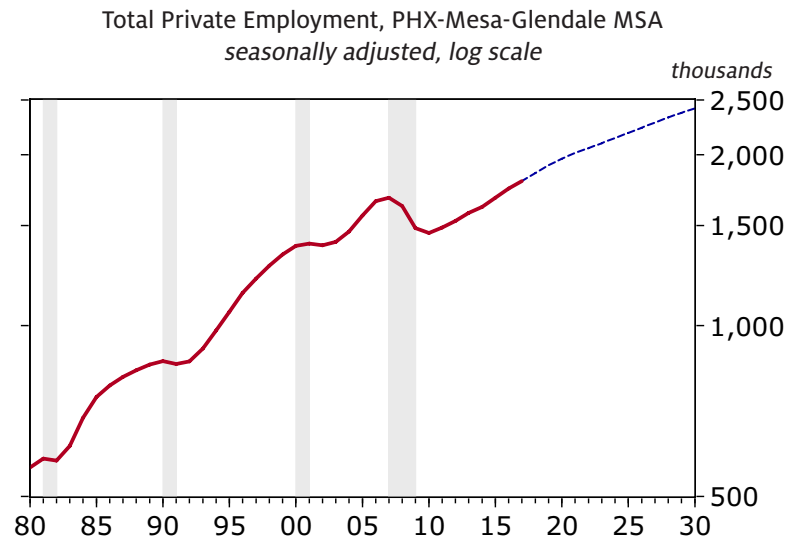
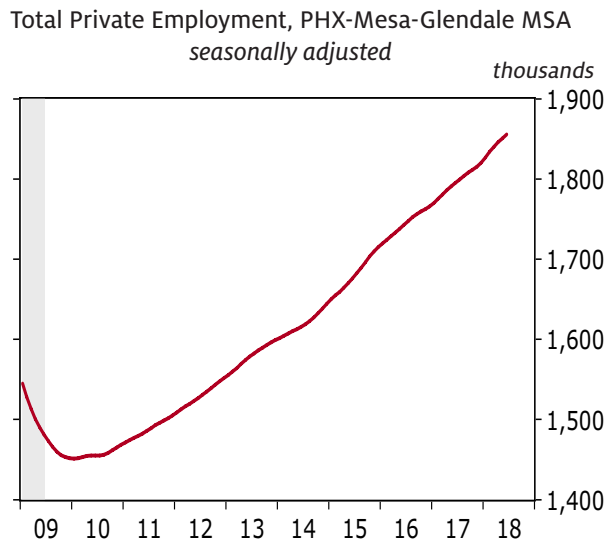
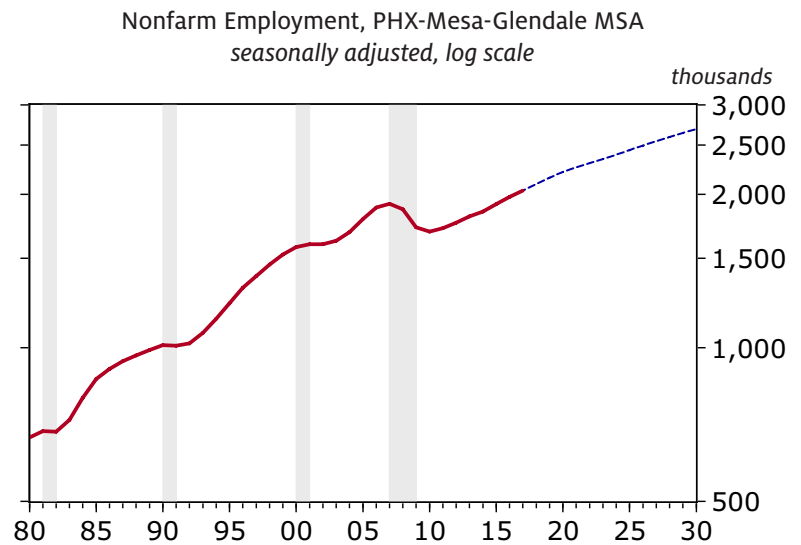
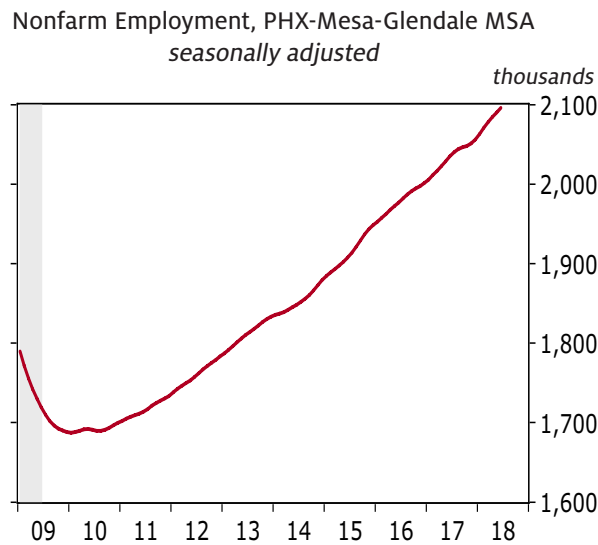
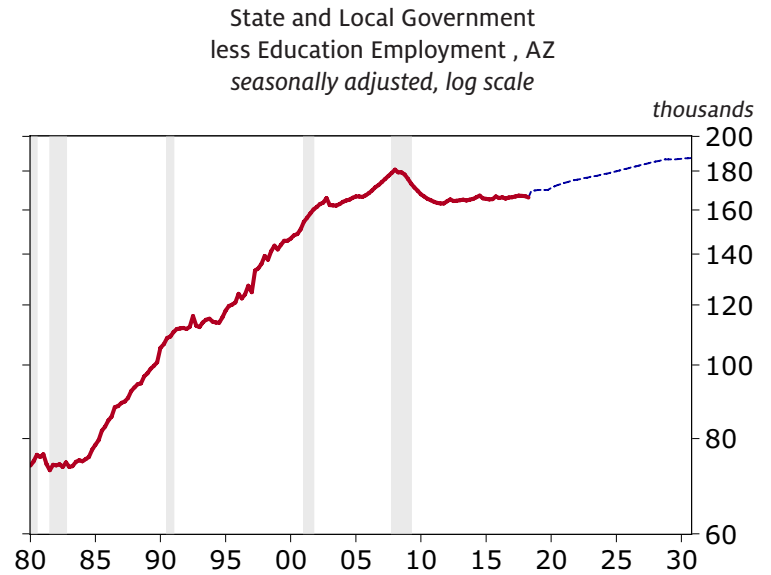
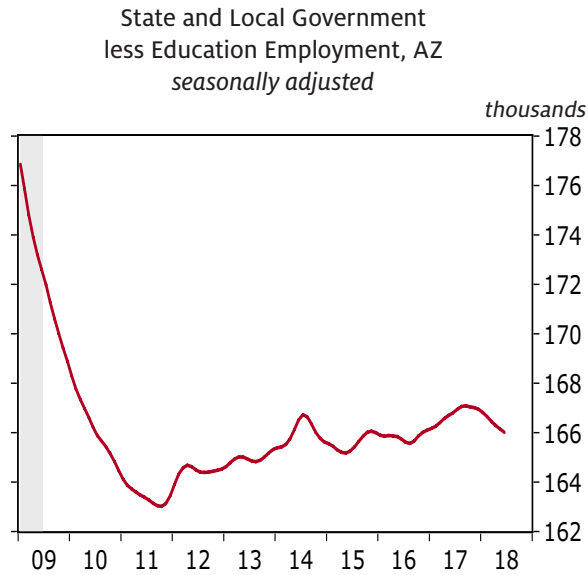
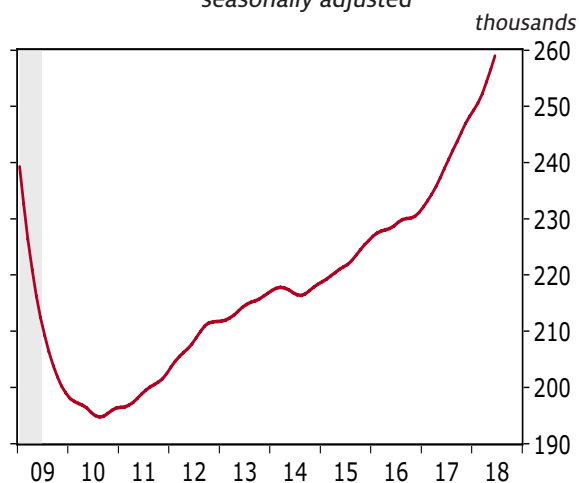
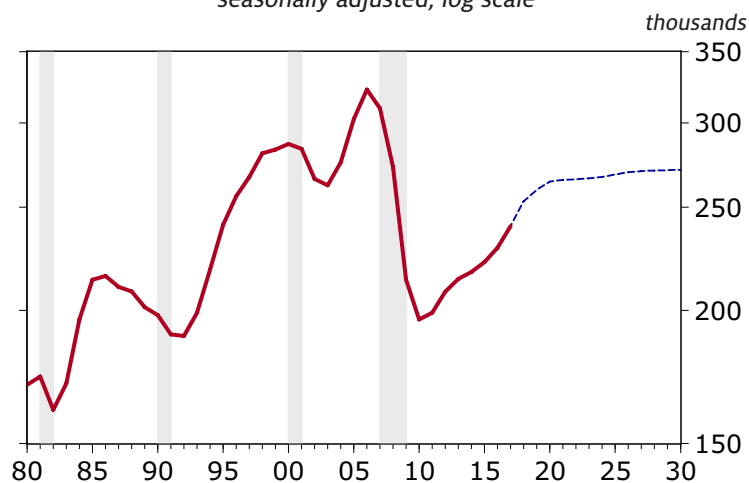


FIGURE 17

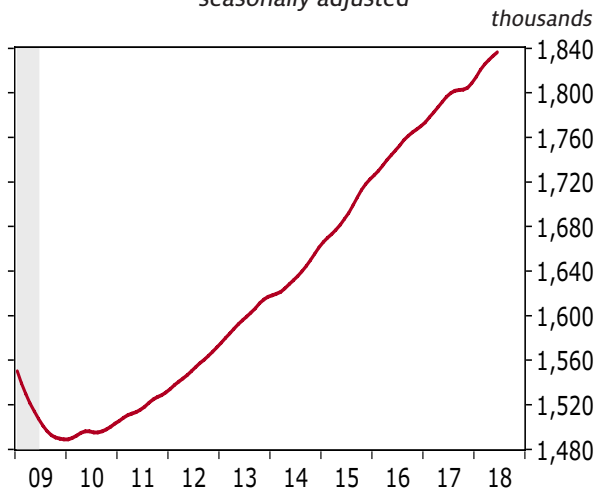
Goods Producing Employment, PPHX-Mesa-Glendale MSA
seasonally adjusted



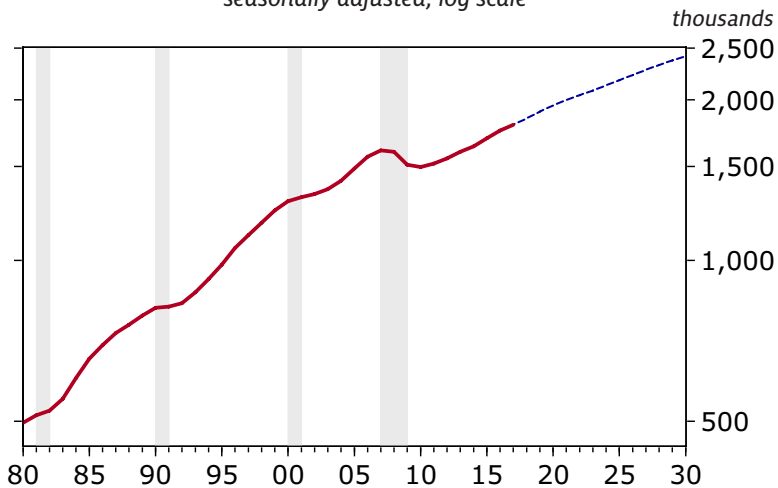
Goods Producing Employment, PHX-Mesa-Glendale MSA
seasonally adjusted, log scale



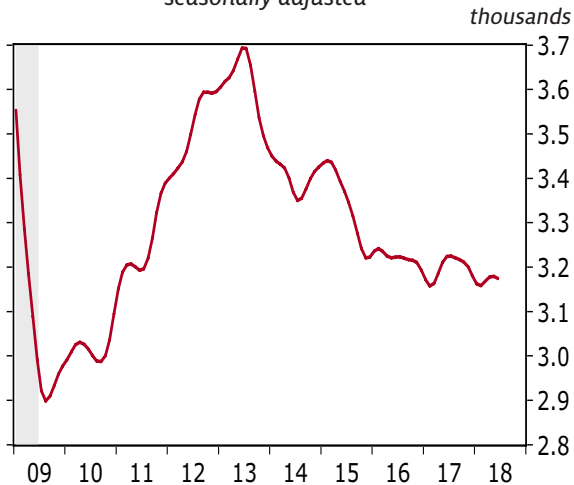
Service Providing Employment, PHX-Mesa-Glendale MSA
seasonally adjusted



Service Providing Employment, PHX-Mesa-Glendale MSA
seasonally adjusted, log scale



Mining Employment, PHX-Mesa-Glendale MSA
seasonally adjusted



Mining Employment, PHX-Mesa-Glendale MSA
seasonally adjusted, log scale

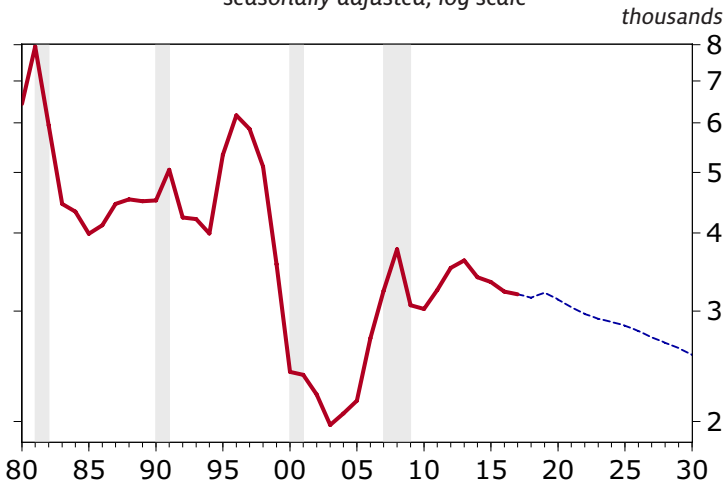
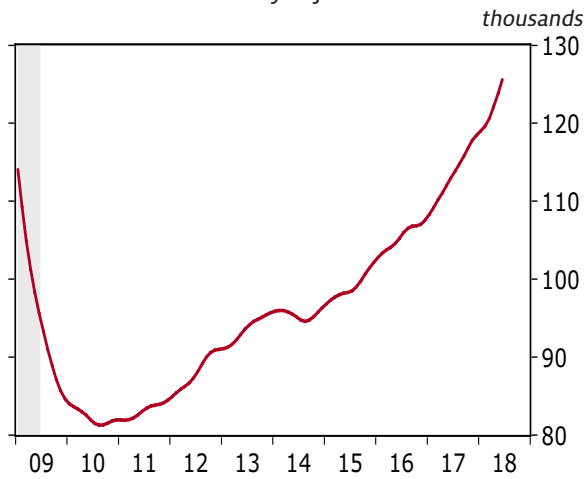
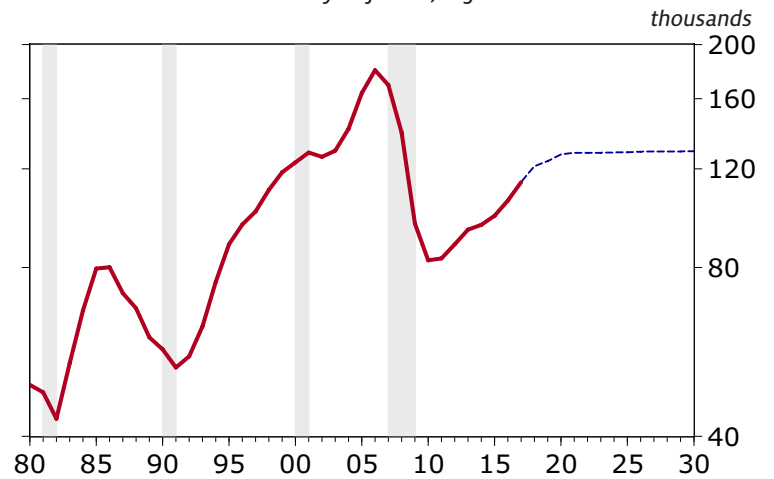


FIGURE 18

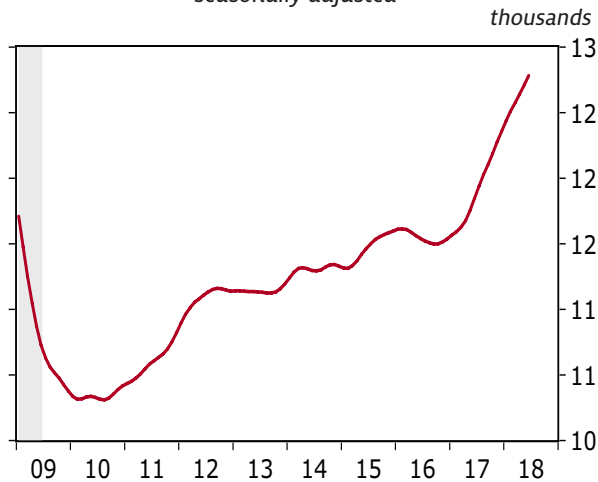
Construction Employment, PHX-Mesa-Glendale MSA
seasonally adjusted



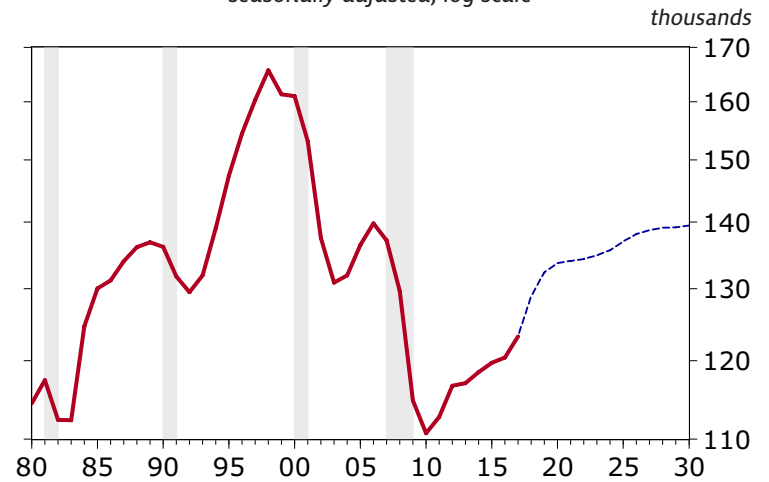
Construction Employment, PHX-Mesa-Glendale MSA
seasonally adjusted, log scale



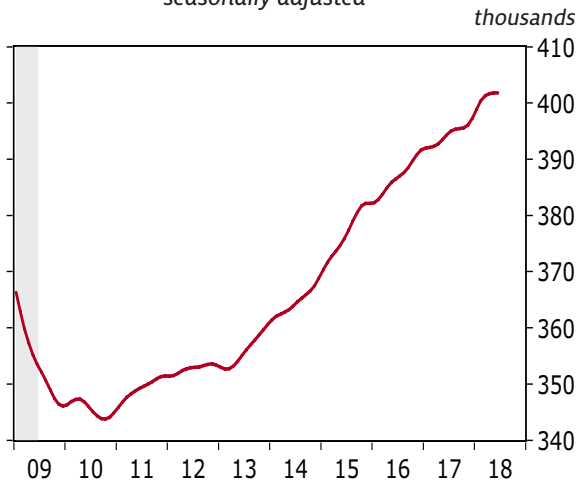
Manufacturing Employment, PHX-Mesa-Glendale MSA
seasonally adjusted



Manufacturing Employment, PHX-Mesa-Glendale MSA
seasonally adjusted, log scale



Trade, Transformation & Utilities
Employment, PHX-Mesa-Glendale MSA
seasonally adjusted



Trade, Transformation & Utilities
Employment, PHX-Mesa-Glendale MSA
seasonally adjusted, log scale

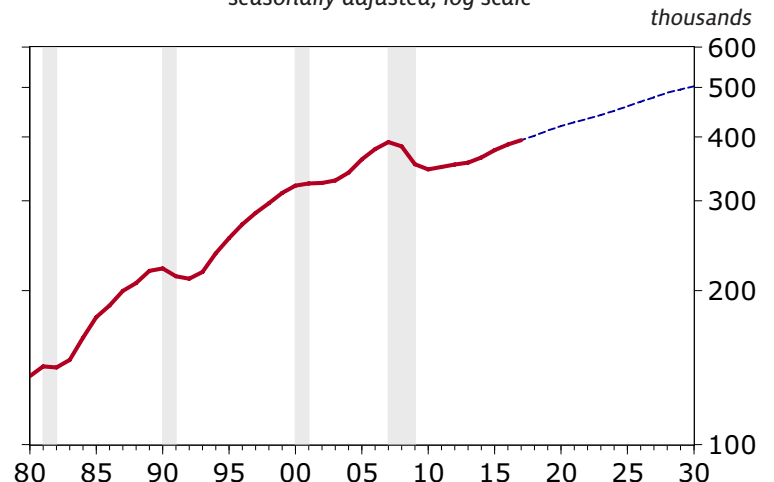
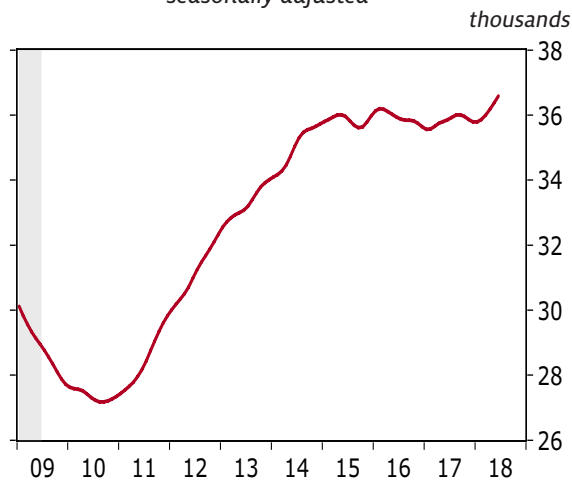
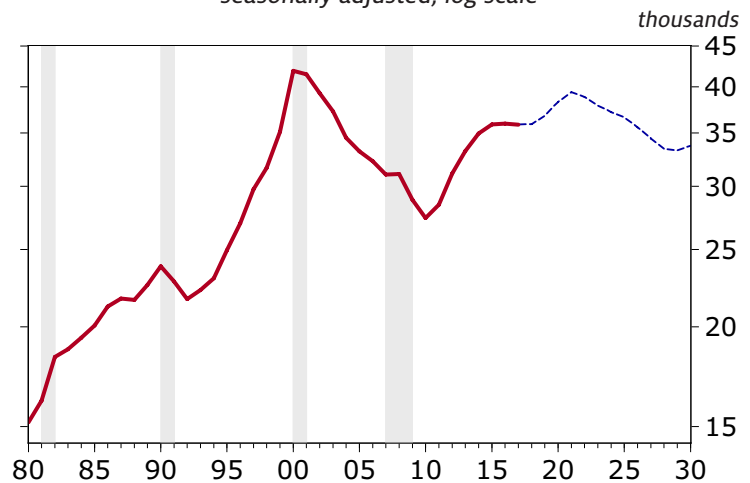


FIGURE 19

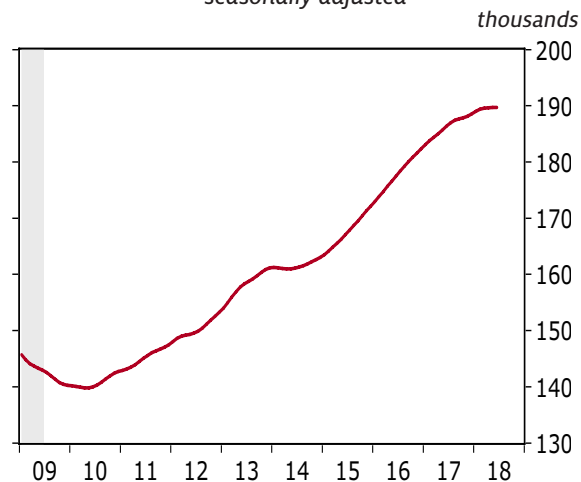
Information Employment, PHX-Mesa-Glendale MSA
seasonally adjusted



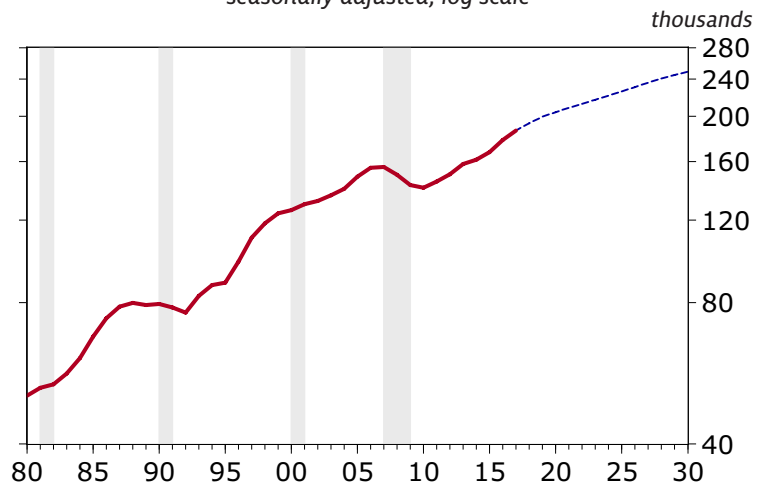
Information Employment, PHX-Mesa-Glendale MSA
seasonally adjusted, log scale



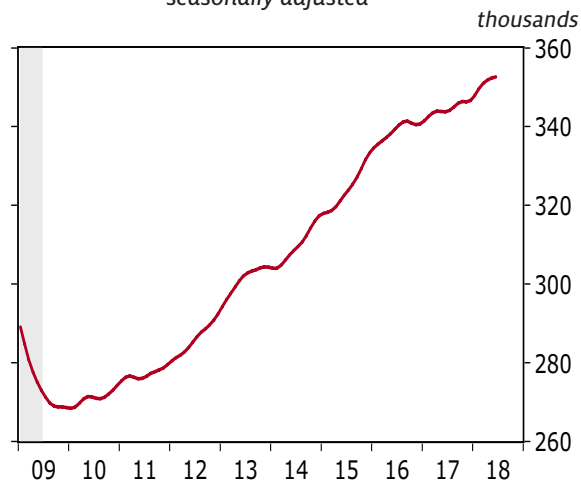
Financial Activities Employment, PHX-Mesa-Glendale MSA
seasonally adjusted



Financial Activities Employment, PHX-Mesa-Glendale MSA
seasonally adjusted, log scale



Professional & Business Services
Employment, PHX-Mesa-Glendale MSA
seasonally adjusted



Professional & Business Services
Employment, PHX-Mesa-Glendale MSA
seasonally adjusted, log scale

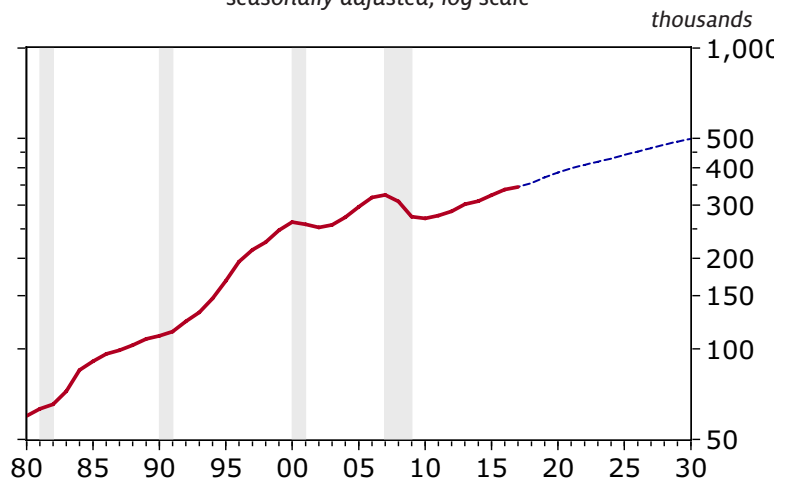
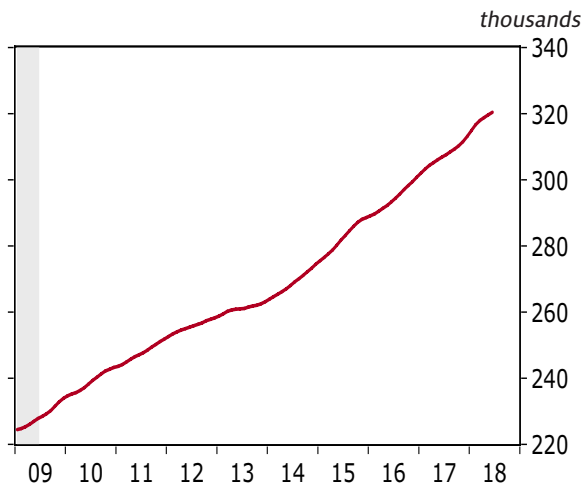
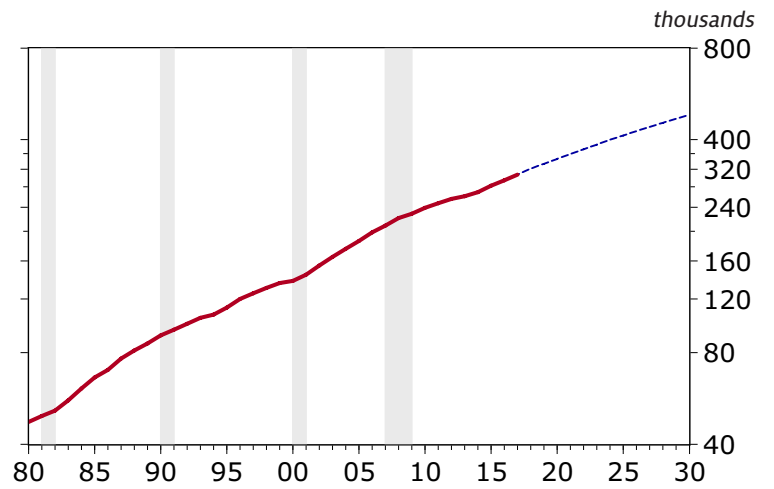


FIGURE 20

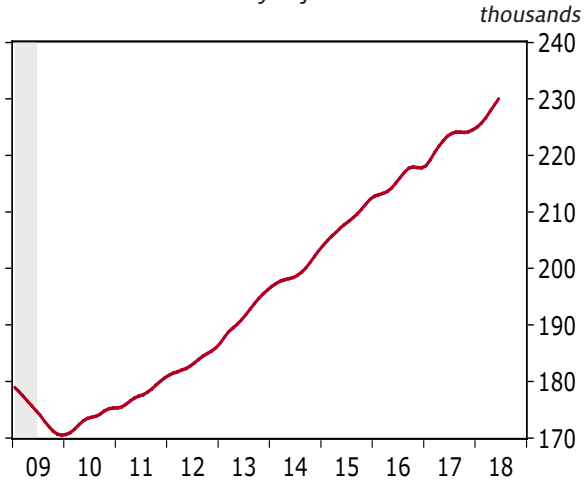
Educational & Health Services
Employment, PHX-Mesa-Glendale MSA
seasonally adjusted



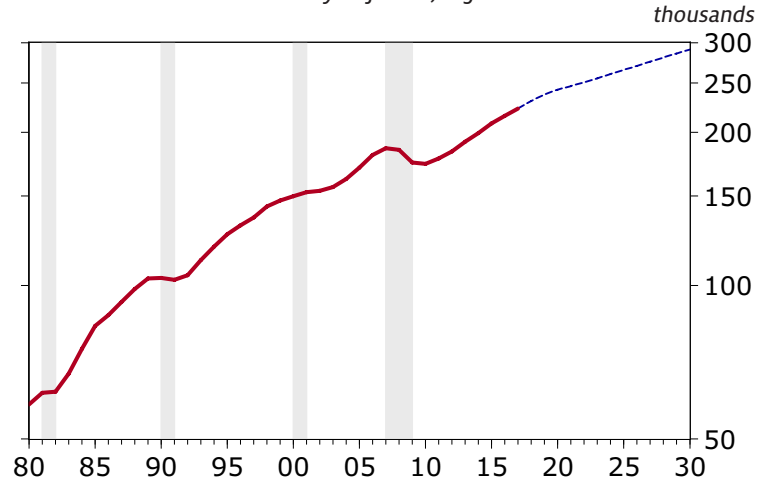
Educational & Health Services
Employment, PHX-Mesa-Glendale MSA
seasonally adjusted, log scale



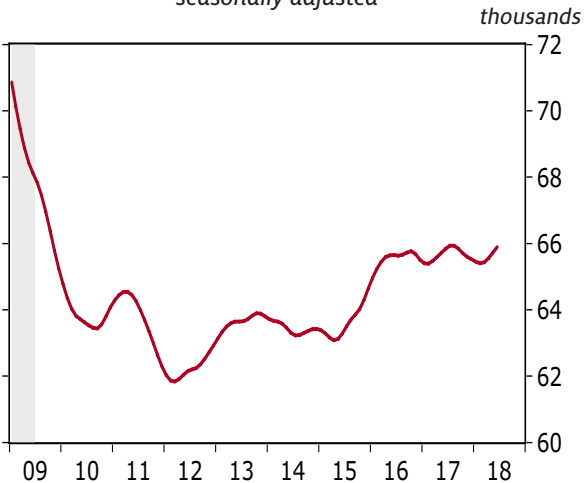
Leisure & Hospitality
Employment, PHX-Mesa-Glendale MSA
seasonally adjusted



Leisure & Hospitality
Employment, PHX-Mesa-Glendale MSA
seasonally adjusted, log scale



Other Services Employment, PHX-Mesa-Glendale MSA
seasonally adjusted



Other Services Employment, PHX-Mesa-Glendale MSA
seasonally adjusted, log scale

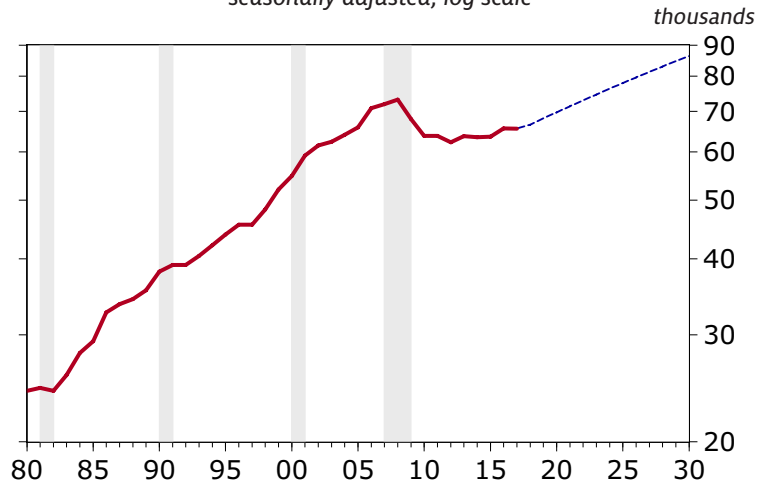
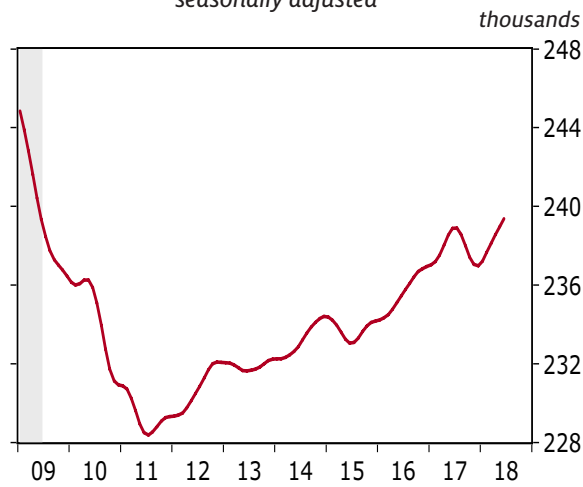
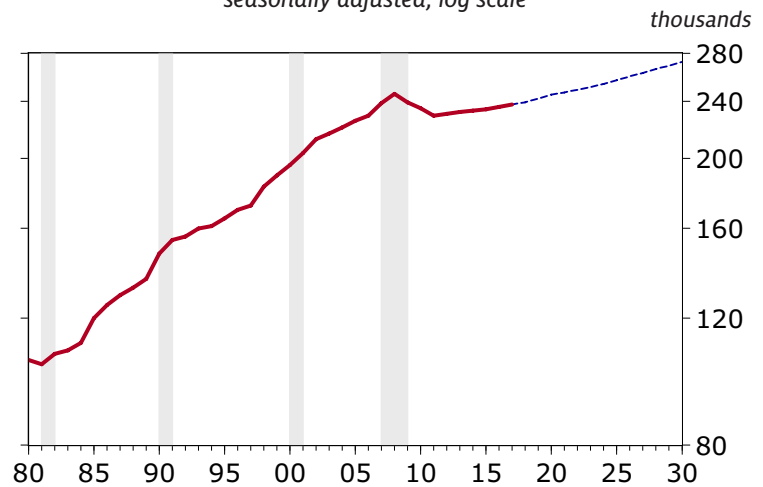


FIGURE 21

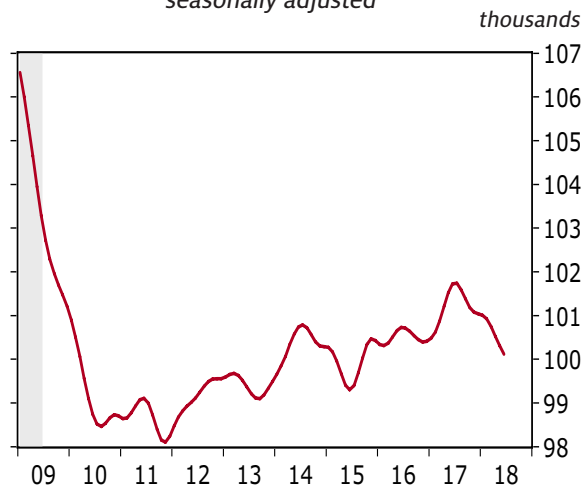
Government Employment, PHX-Mesa-Glendale MSA
seasonally adjusted



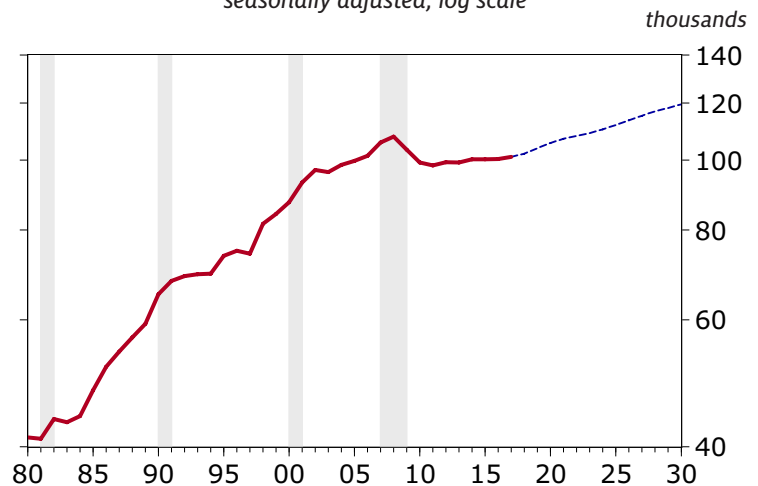
Government Employment, PHX-Mesa-Glendale MSA
seasonally adjusted, log scale



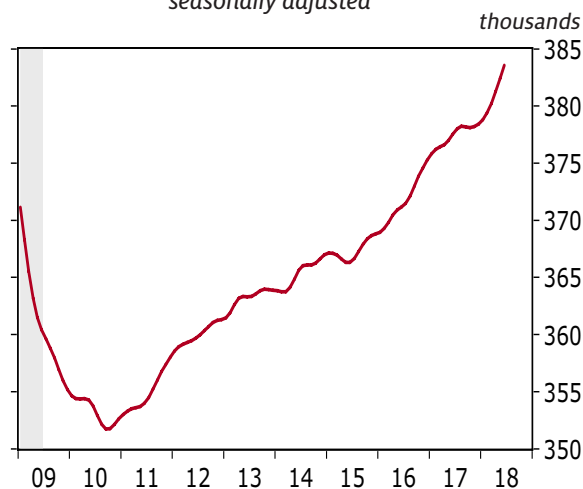
State and Local Government less
Education Employment, PHX-Mesa-Glendale MSA
seasonally adjusted



State and Local Government less
Education Employment, PHX-Mesa-Glendale MSA
seasonally adjusted, log scale



Nonfarm Employment, Tucson MSA
seasonally adjusted



Nonfarm Employment, Tucson MSA
seasonally adjusted, log scale

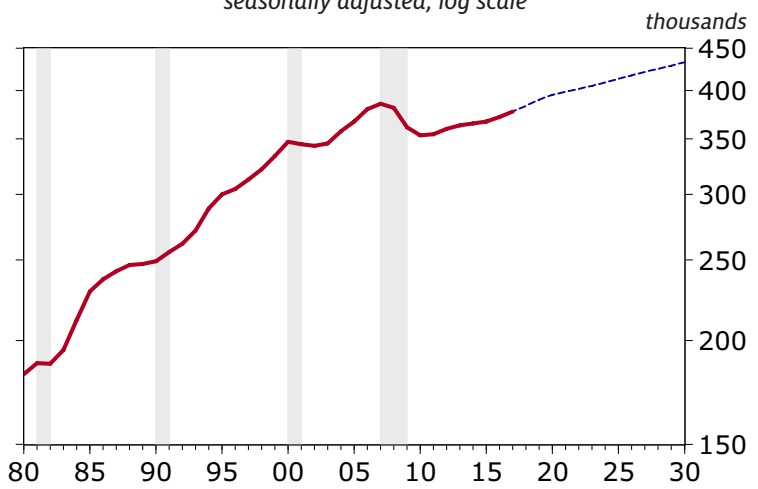


FIGURE 22

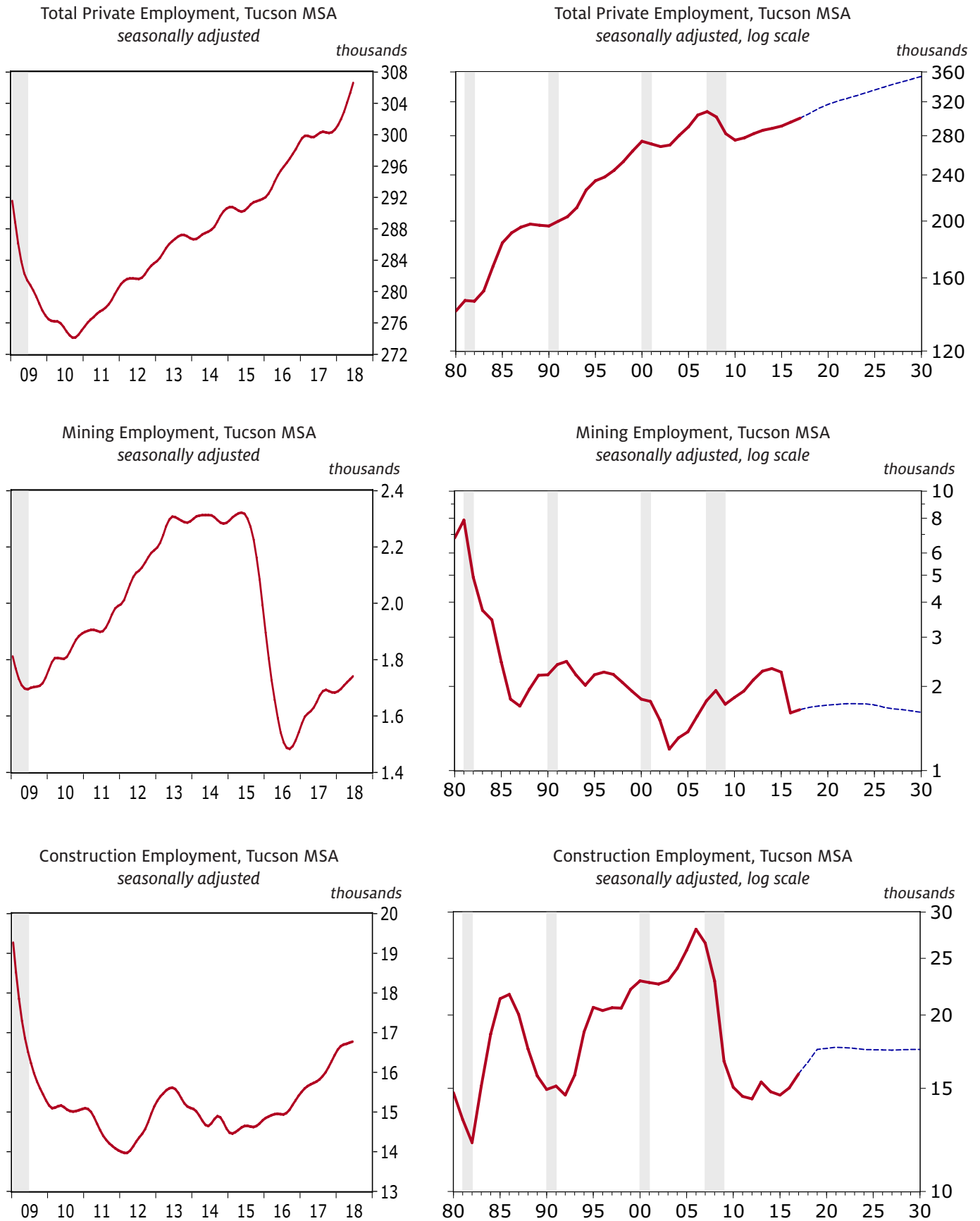


FIGURE 23

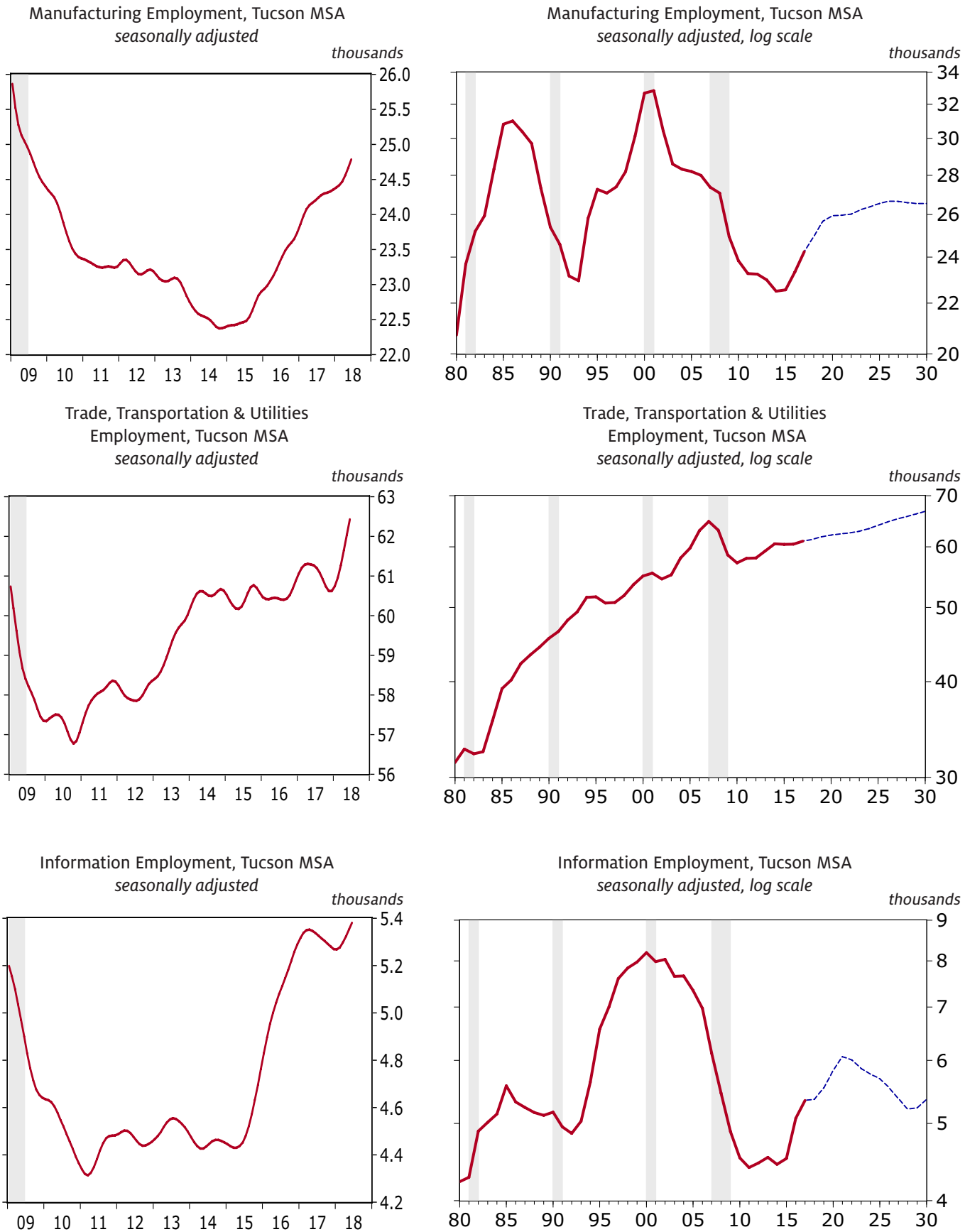


FIGURE 24

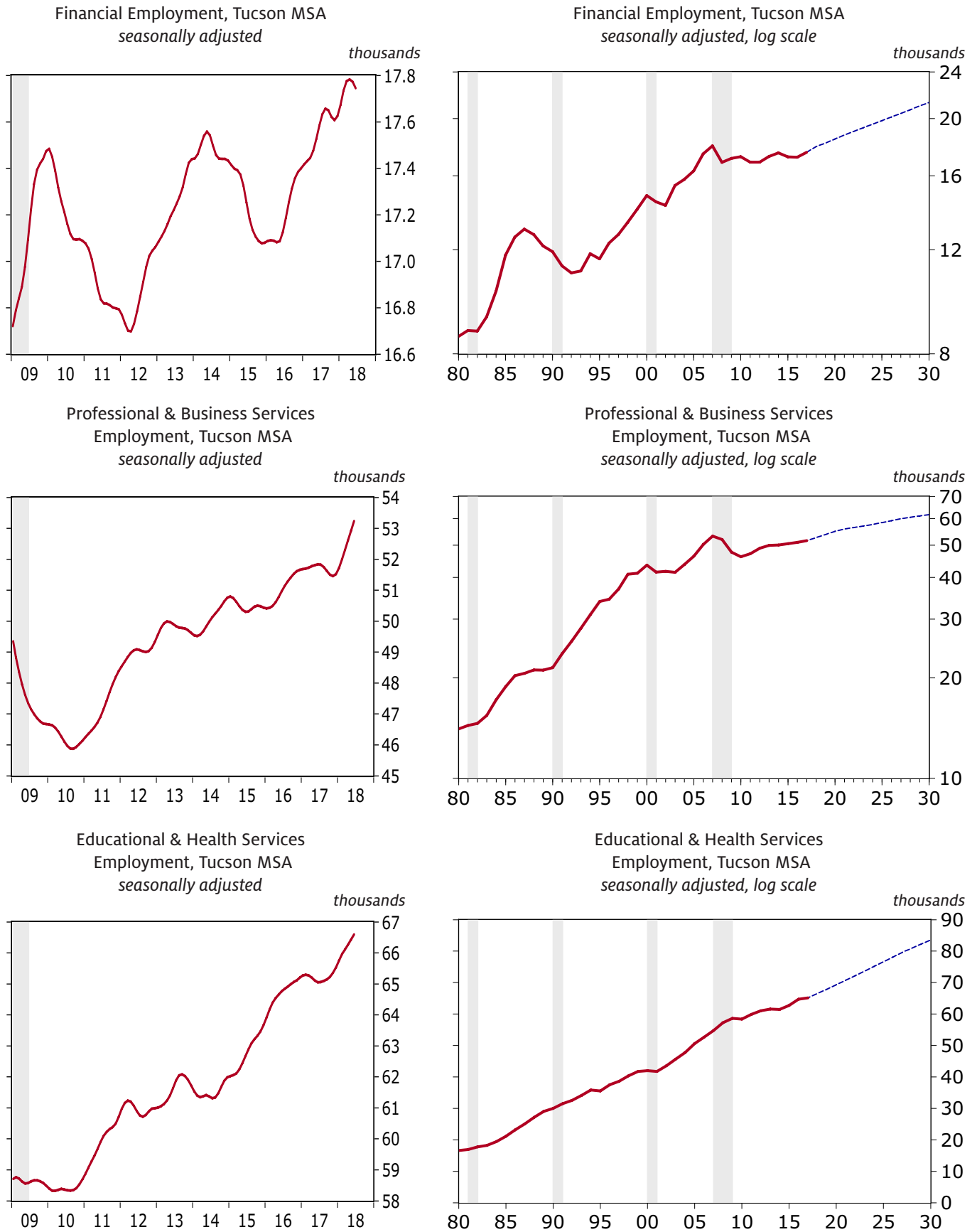
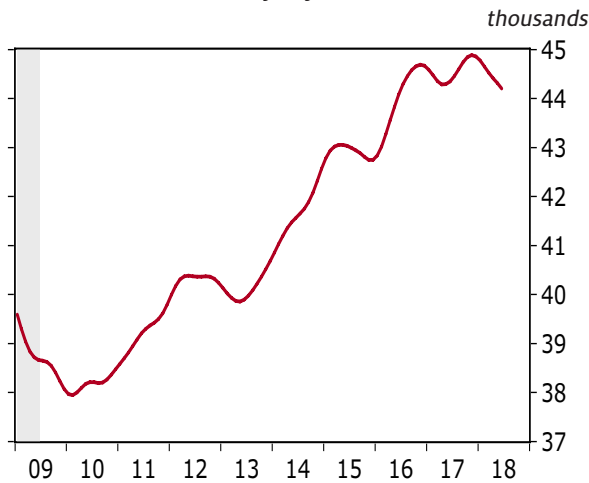
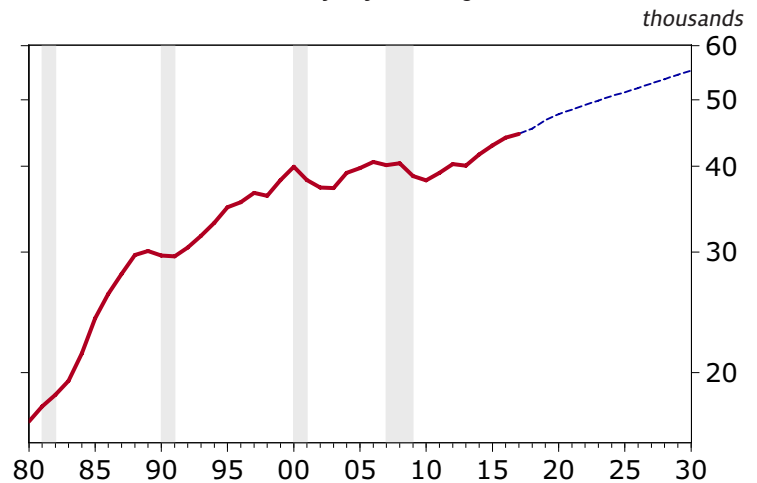


FIGURE 25

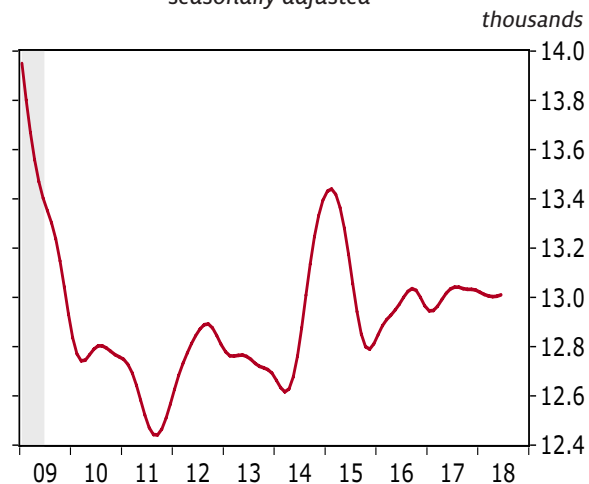
Leisure and Hospitality
Employment, Tucson MSA
seasonally adjusted



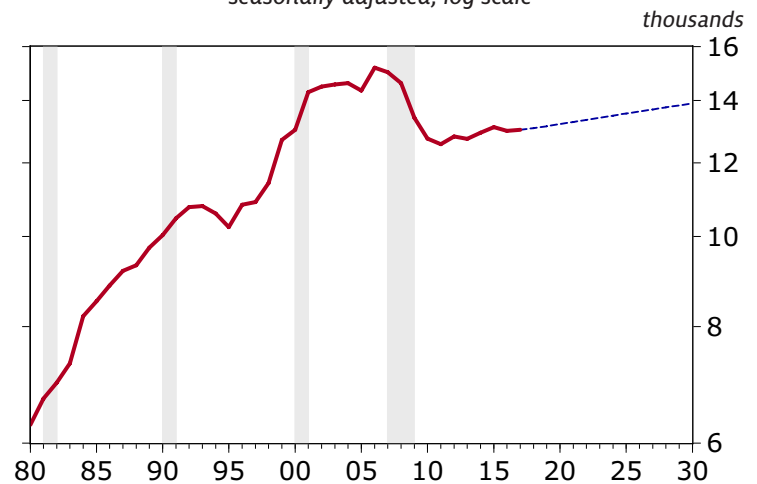
Leisure and Hospitality
Employment, Tucson MSA
seasonally adjusted, log scale



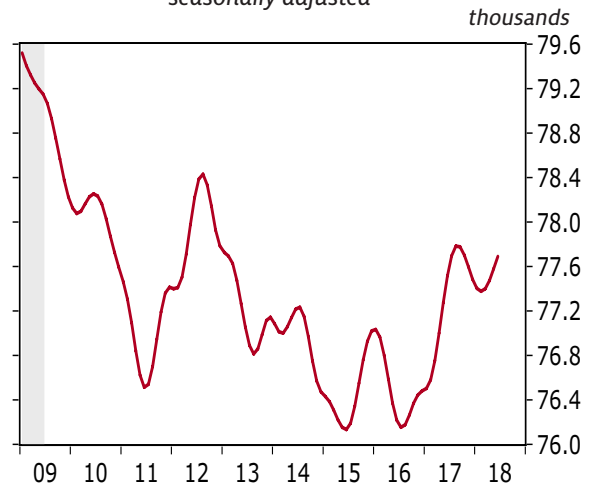
Other Services Employment, Tucson MSA
seasonally adjusted



Other Services Employment, Tucson MSA
seasonally adjusted, log scale



Government Employment, Tucson MSA
seasonally adjusted



Government Employment, Tucson MSA
seasonally adjusted, log scale

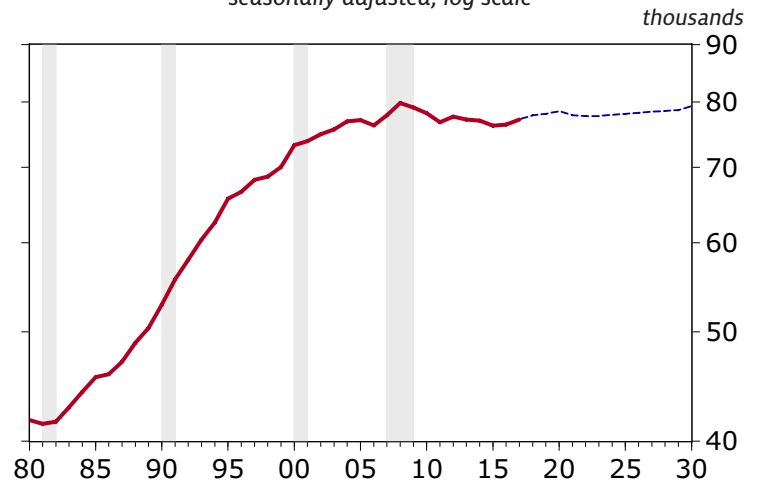
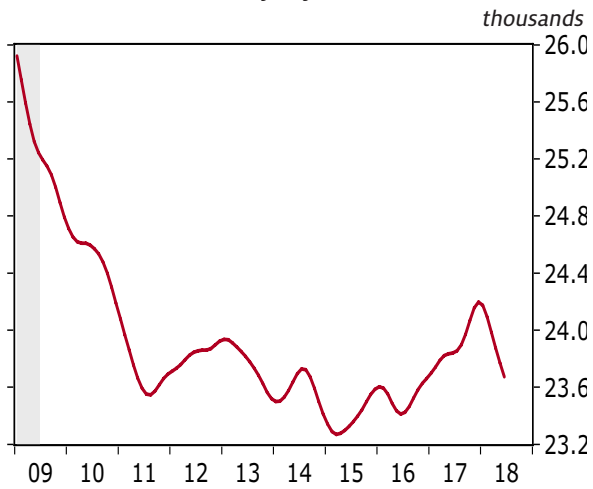


FIGURE 26

State and Local Government less
Education Employment, Tucson MSA
seasonally adjusted



State and Local Government less
Education Employment, Tucson MSA
seasonally adjusted, log scale

