

How Sensitive Are Arizona’s Metro Areas to National Economic Changes?

As of July 2016, U.S. nonfarm payroll employment grew by 1.7% while Arizona’s employment pace was a much stronger 2.6%, as shown in Table 1. However, the change in the pace—the acceleration or deceleration—moved in opposite directions between the nation and the state over a 12-month period ending in July 2016. If the national job market growth is moderating, what will that mean for the state?

Consider a couple of statistics that empirically tell that story. The U.S. job pace has slowed from 2.1% in July 2015 to 1.7% in July 2016, or about 0.4 percentage points. At the same time, the Arizona pace of employment growth notched up a tad (+0.07 percentage points or pp.).

This raises two questions:

- (1) What is the relationship between the national trend and that of Arizona?; and similarly,
- (2) How do the key cities in Arizona respond to national job trends?

Moreover, the pattern of change in employment growth, as shown in Table 1, by Arizona’s seven key metro areas is varied with Prescott and Tucson experiencing a very strong acceleration in growth, while Flagstaff and the Lake Havasu City-Kingman areas having a dramatic slowdown in job growth over the past 12 months.

To be sure, there would be a lot of reason to assume that the national sector composition of the growth would matter most to the region since, for example, the share of a specific fast growing industry would likely matter more to an area that has a higher share of that industry’s employment, and vice versa. Although this point is well accepted, it possible to address these questions more broadly.

Table 1

Year-over-Year Changes in National, State and Local Employment Growth			
	July 2016	July 2015	Percentage Point Change
United States	1.72%	2.10%	-0.38 pp.
Arizona	2.55	2.48	+0.07
Flagstaff, AZ	0.15	1.88	-1.73
Lake Havasu City-Kingman, AZ	0.42	1.50	-1.08
Phoenix-Mesa-Scottsdale, AZ	2.96	3.36	-0.40
Prescott, AZ	6.79	1.17	+5.62
Sierra Vista-Douglas, AZ	1.85	-0.85	+2.70
Tucson, AZ	3.95	-0.19	+4.14
Yuma, AZ	2.44	1.33	+1.11

Borrowing an approach from modern portfolio theory, statistical risk measures—such as the “alpha”, “beta” and “R-squared” derived from a least-squares regression—can be calculated to help answer those earlier questions about how sensitive is Arizona or a city to changes in the national economy. Simply put for our application, alpha represents trend growth and beta measures the sensitivity to national employment changes. The R-squared measure tells us how strong the relationship is overall—the larger the number, the stronger the relationship. The results of this approach are shown in Table 2.

Here are the key takeaways:

- All of the key metro areas in Arizona with the exception of Sierra Vista-Douglas are sensitive to the national economy, but by varying degrees. A beta over 1.00 shows the degree of “over” sensitivity which ranges from 16% for Yuma to 82% for Prescott. The Sierra Vista-Douglas area is pretty much insulated from national trends.
- The alpha measures tell an interesting story with Tucson’s trend job growth around 0%, but Yuma’s trend year-over-year job growth about 1¼%. Most other cities and the state are in the 0.3% to 0.6% range. Prescott, which is experiencing strong year-over-year employment growth currently also has the highest trend growth among Arizona’s metropolitan areas.
- The final statistic—the R-squared—suggests that Phoenix is more in synch with job growth in the national economy than any other metro area. Tucson is the second most linked city in the state, but Sierra Vista-Douglas is essentially having no national impact, while Yuma’s impact is low.

Table 2

Measuring Employment Sensitivity to National Trends			
2000-2016 (July), Year-over-Year Percentage Change			
	Alpha	Beta	R-Squared
Arizona	0.31	1.62	0.82
Flagstaff, AZ	0.35	1.26	0.60
Lake Havasu City-Kingman, AZ	0.47	1.41	0.30
Phoenix-Mesa-Scottsdale, AZ	0.40	1.79	0.83
Prescott, AZ	0.63	1.82	0.57
Sierra Vista-Douglas, AZ	0.40	0.28	0.03
Tucson, AZ	0	1.19	0.71
Yuma, AZ	1.28	1.16	0.38
<i>Median of Key AZ Cities</i>	<i>0.40</i>	<i>1.26</i>	<i>0.57</i>
<i>Mean of Key AZ Cities</i>	<i>0.50</i>	<i>1.27</i>	<i>0.49</i>

The importance of this is what it tells us about the present economic situation, when the metrics are taken as a whole and with a bit of judgment. The national slowdown in economic and employment growth seemingly explains why the Phoenix metro—though still showing relatively strong job growth—has moderated somewhat since it is relatively more sensitive to the national trends. Presumably, the rapid job growth in Prescott could be at risk from the U.S. job growth moderation in the coming months. Moreover, Flagstaff, Tucson, and Yuma—which have employment betas around 1.2—all have some sensitivity to the national slowdown, but for those cities the national trends are not as dominant as found in other Arizona metros. Finally, the Sierra Vista metro must find its own way since the trickle down impact from the national economy is negligible.

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