

# RESEARCH UPDATE

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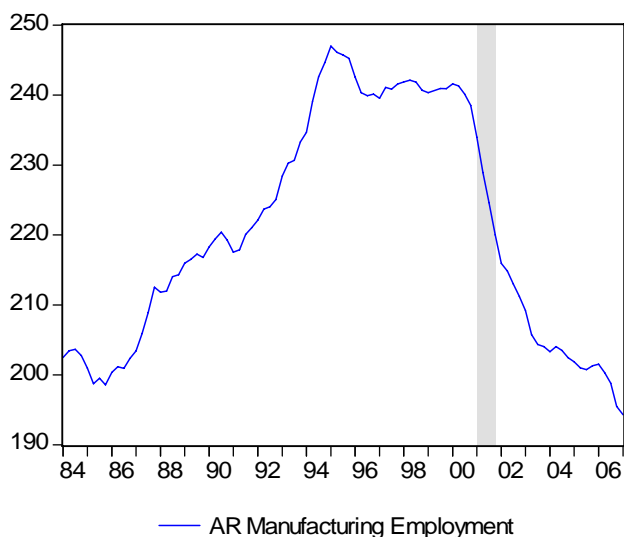
## Has Manufacturing Employment Stabilized?

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Manufacturing has been and still is a major employment sector in Arkansas' economy. As such, labor market movements are important to understand for our current economy and future economic growth.

Since the early to mid-1980s, manufacturing employment had been climbing steadily to its peak in 1995. The first quarter 1995 employment was just under 247,000 manufacturing jobs in Arkansas or just over 23% of total employment. However, manufacturing employment fell to around 240,000 until the start of the 2001 recession (represented by the shaded bar).

Figure 1. Arkansas Manufacturing Employment



Manufacturing employment started declining just prior to the 2001 recession and has continued with employment around 195,000 or about 16% of total

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employment. While manufacturing employment has been declining, Arkansas has experienced a transition into more service-providing industries.

The question still remains, “Has manufacturing employment stabilized?” Fluctuations in the labor market lead to uncertainty for forecasters and planners. For example, such variability is difficult for business planning future workforce needs and availability.

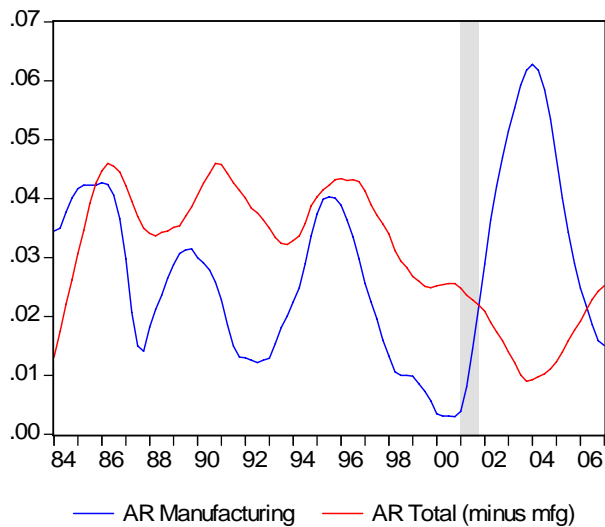
This update looks at a measure of labor market volatility of the manufacturing sector relative to the other labor markets (in total) for Arkansas. The coefficient of variation,  $C_v$ , is a measure of dispersion of a probability function.  $C_v$  is defined as the ratio of the standard deviation to the mean as follows:

$$(1) \quad C_v = \frac{\sigma}{\mu}$$

where  $\sigma$  is the standard deviation and  $\mu$  is the mean.

The coefficient of variation is calculated over the previous 16 quarters for Arkansas (seasonally adjusted) manufacturing employment, as well as, the total nonfarm employment (minus manufacturing). Therefore, first quarter of 1984 coefficient of variation used the previous 20 quarters (1980Q1 to 1983Q4) for calculation purposes. This rolling window continued through 2007 and has the advantage of observing how the coefficient of variation (or labor market volatility) changes over time.

Figure 2. Labor Market Volatility



Labor market volatility for manufacturing and the other sectors combined over the 1984 to 2007 period is illustrated in Figure 2. Employment volatility in manufacturing has typically been more stable or less volatile relative to the rest of Arkansas’ labor market.

This is indicated by manufacturing employment volatility being less than total through most of the sample period leading up to the recession (denoted by the shaded area).

After the 2001 recession, manufacturing employment volatility started to drastically increase while the rest of Arkansas’ labor market becomes more stable (as indicated by the decline in labor market volatility. This initial decline in total labor market volatility corresponds to the transition from goods-producing industries to more service-providing industries. As a result of this transition, the overall labor market became diversified, which will serve the state well in dampening the effects of future recessions or downturn in the long run.

Interestingly, the volatility in manufacturing employment has started to decline as the sector stabilizes. While employment in manufacturing may continue to decline over the next several years, the declining volatility leads to a more stable and certain labor market. This improved stability benefits the State’s workforce planning and development activities, as well as businesses in their location decisions.



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