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RESEARCH UPDATE

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Arkansas Industry-Level Employment Cycles

Mark A. Thompson

Economists are often interested in employment projections. However, such projections depend on several factors and an understanding of labor market movements. This update focuses on monthly industry-level employment numbers for the State of Arkansas, as well as, the United States (US) over the period 1990 to 2006. The following eight (8) sectors were examined: construction (CON), education and health services (EHS), financial activities (FIN), leisure and hospitality (LAH), manufacturing (MFG), natural resources and mining (NRM), professional and business services (PBS), and trade, transportation, and utilities (TTU).

While industry sectors behave differently, it is important to understand how they behave to yield better projections. For example, some sectors may be more or less cyclical than other sectors. That is, more volatile sectors will have less accurate employment projections. In addition, how do different sectors respond relative to the US industry movements? Which sectors lead the US and which sectors lag the US? This information would be useful to budget analysts interested in unemployment insurance claims, as well as, local businesses interested in short- and long-term staffing projections.

In order to address these questions, the cyclical movement in employment needs to be separated from the trend growth in employment. To do so, the Baxter-King filter (Baxter and King, 1999) is employed to separate the trend from the cyclical component in each of the Arkansas and US industry-level employment series.

Inside This Issue

Once the cyclical component of each employment series is obtained, the standard deviation is computed as a measure of employment variability. For Arkansas, the sector with the most variability or most cyclical sector is construction, followed by natural resources and mining, and manufacturing. The least cyclical sectors are education and health services and financial activities (see Table 1).

Table 1. Industry Rankings (Most to Least Cyclical)

1.	Construction (CON)
2.	Natural Resources & Mining (NRM)
3.	Manufacturing (MFG)
4.	Professional & Business Services (PBS)
5.	Trade, Transportation, & Utilities (TTU)
6.	Leisure & Hospitality (LAH)
7.	Education & Health Services (EHS)
8.	Financial Activities (FIN)

The rankings in Table 1 illustrate how the different sectors behave differently. Thus, staffing requirements and projections need to be sector specific. In addition, projections for construction and manufacturing will have more variability (or there will be greater uncertainty) than projections for financial activities and education and health services (or there will be greater certainty).

The second question of this update addresses Arkansas employment cycles relative to US employment cycles. That is, how do the different Arkansas employment sectors respond relative to their respective US sector. Which sectors lead or lag the US and by how many months?

The cyclical correlations for each employment sector are examined. This update reports the correlation coefficient for the highest correlation plus or minus six (6) months. To interpret the results from Table 2, look at period *t*. The US trade, transportation, and utilities has the highest correlation (with the Arkansas TTU sector) at period *t*. Therefore, the TTU employment cycle does not lead or lag the US TTU, but moves synchronously with the national cycle. The current US Manufacturing (MFG) employment cycle is most closely correlated with previous two-month change in Arkansas (*t-2*). On the other hand, US CON employment cycle is most closely correlated with four-month future change in Arkansas (*t+4*). Therefore, NRM, MFG, and PBS tend to lead the US employment cycle; whereas, the CON, EHS, and FIN tend to lag the US employment cycle.

This update has provided evidence that different sectors behave differently; more importantly, this update has shed light on how these sectors behave to improve our understanding of employment cycles. For example, national movements in CON, EHS, and FIN may provide us some indication as to what the coming months may bring for these respective industries.

REFERENCES

Baxter, M. and R. King, "Measuring Business Cycles: Approximate Band-Pass Filters for Economic Time Series," *Review of Economics and Statistics*, 81, 1999, 575-593.

Table 2. Industry-Level Employment Correlations

AR Leads US				*AR Lags US*					
t-3	*t-2*	*t-1*	*t*	*t+1*	*t+2*	*t+3*	*t+4*	*t+5*	*t+6*
NRM (0.51)	**MFG** (0.83)		**TTU** (0.87)				**CON** (0.58)	**EHS** (0.63)	**FIN** (0.57)
	PBS (0.83)		**LAH** (0.74)						