Nebraska Monthly Economic Indicators: April 21, 2017

Prepared by the UNL College of Business Administration, Bureau of Business Research

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Summary: *The Leading Economic Indicator – Nebraska (LEI-N)* [1] *rose by 1.00% during March of 2017. This increase followed rapid increases in both January and February. Taken together, the three increases suggest that economic growth will be strong in Nebraska during the second half of 2017. Among the components of the indicator, business expectations were strong during March. The value of the U.S. dollar also fell during March, which is a positive sign for Nebraska's export-oriented businesses, particularly in agriculture and manufacturing. In addition, manufacturing hours increased during March.*

Leading Economic Indicator – Nebraska

Figure 1 shows the change in the Leading Economic Indicator – Nebraska (LEI-N) during March 2017 compared to the previous month. The LEI-N predicts economic growth six months into the future. The LEI-N rose by 1.00% in March.
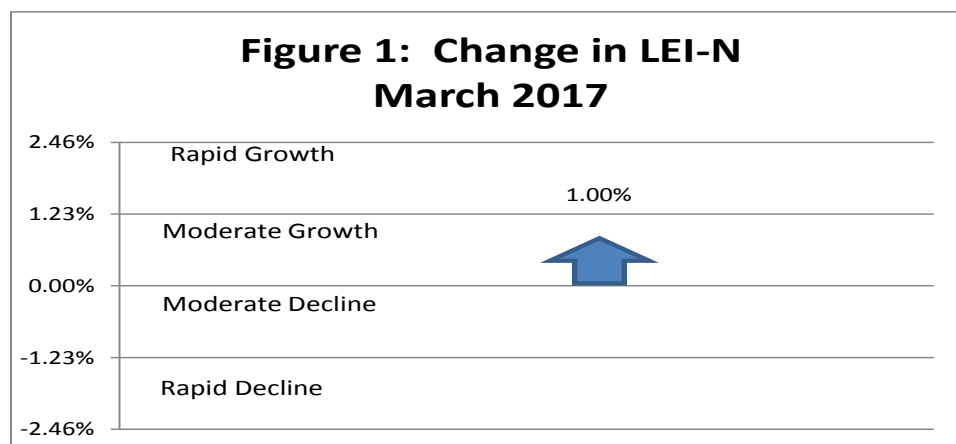

Figure 1: Change in LEI-N March 2017

Figure 2 shows the change in the LEI-N over the last six months. The indicator declined at the end of 2016 but has increased sharply throughout 2017. The pace of improvement, however, moderated during March. Given this deceleration, it will be interesting to see if the indicator continues to rise over the coming months.

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[1] The author would like to thank Dr. William Walstad for helping to design the LEI-N.

**Figure 2: Change in LEI - N
Last 6 Months**

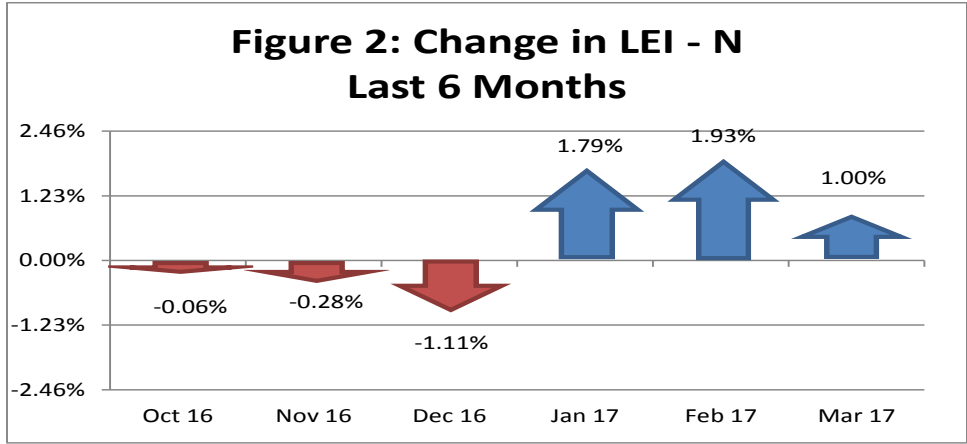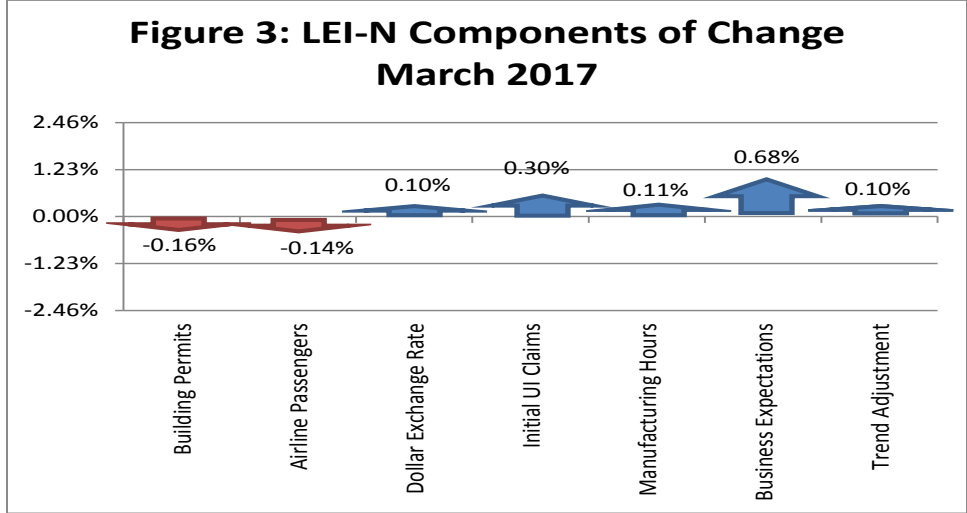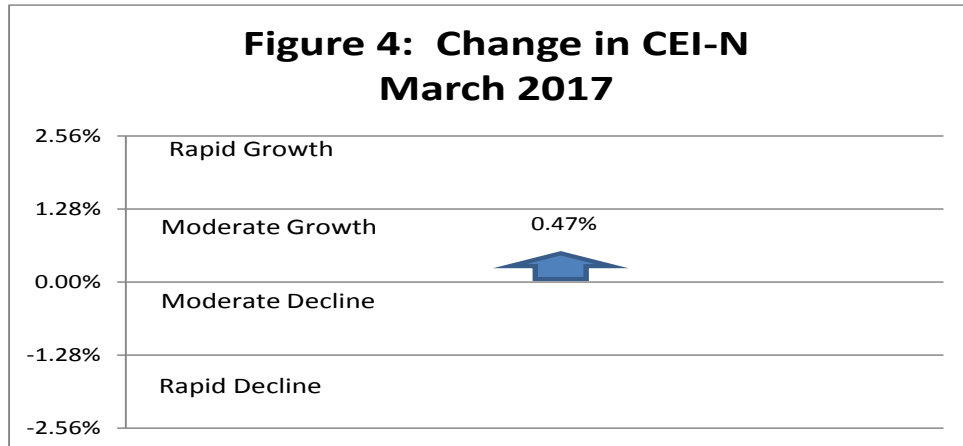|	Oct 16	Nov 16	Dec 16	Jan 17	Feb 17	Mar 17
	-0.06%	-0.28%	-1.11%	1.79%	1.93%	1.00%

Figure 3 shows the components of change in the Leading Economic Indicator – Nebraska during March 2017. The change in the overall LEI–N is the weighted average of changes in each component (see page 5). Business expectations were strong during March. Respondents to the March *Survey of Nebraska Business* predicted strong growth in both sales and employment at their businesses over the next six months. In addition, the value of the U.S. dollar fell during March, a positive development for export-oriented businesses in Nebraska, including in agriculture and manufacturing. Consistent with that, manufacturing hours rose during March. Note that the trend adjustment component pictured in Figure 3 is discussed on page 5.

**Figure 3: LEI-N Components of Change
March 2017**

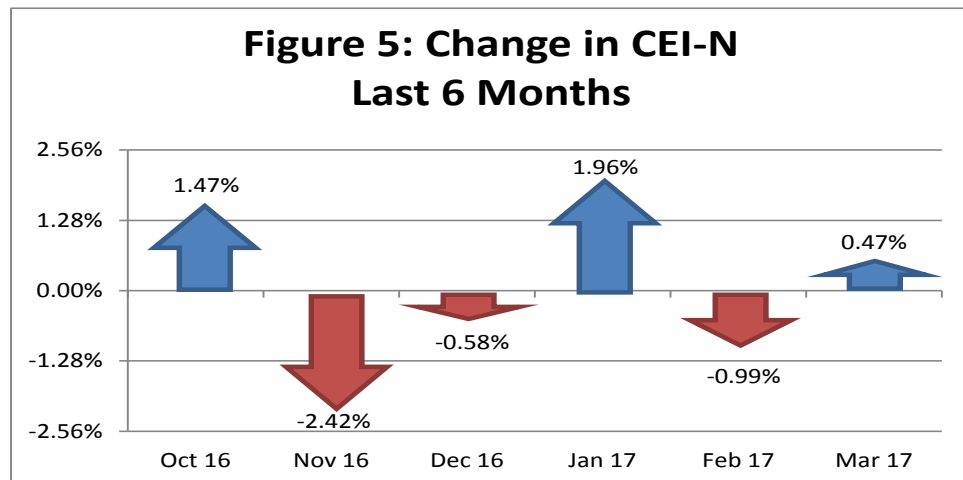| Building Permits	Airline Passengers	Dollar Exchange Rate	Initial UI Claims	Manufacturing Hours	Business Expectations	Trend Adjustment
-0.16%	-0.14%	0.10%	0.30%	0.11%	0.68%	0.10%

Coincident Economic Indicator – Nebraska

The Coincident Economic Indicator - Nebraska (CEI-N) is a measure of the current size of the Nebraska economy. The CEI-N rose, by 0.47%, during March 2017, as seen in Figure 4.

Figure 4: Change in CEI-N March 2017

2.56%	Rapid Growth
1.28%	Moderate Growth 0.47%
0.00%	Moderate Decline
-1.28%	Rapid Decline
-2.56%	

The March increase in the CEI-N follows a sharp increase during January and a decline during February. Overall, the CEI-N has improved during the first quarter of 2017. This is in contrast to the decline in the CEI-N during the last quarter of 2016. Economic conditions appear to be improving in Nebraska.

Figure 5: Change in CEI-N Last 6 Months

	Oct 16	Nov 16	Dec 16	Jan 17	Feb 17	Mar 17
	1.47%	-2.42%	-0.58%	1.96%	-0.99%	0.47%

Two components of the CEI-N rose during March (Figure 6). There was an increase in agricultural commodity prices and electricity sales during the month. This improvement in prices for corn and beef provides further evidence that commodity prices are stabilizing, albeit at low levels. Among other indicators, real private wages were stagnant for the month, indicating that employment increases were offset by a decline in weekly hours and real wages. Finally, business conditions declined slightly during March. Respondents to the *Survey of Nebraska Business* indicated that sales fell slightly while employment

grew modestly during recent months. A detailed discussion of the components of the CEI-N and LEI-N can be found at www.cba.unl.edu in *Technical Report: Coincident and Leading Economic Indicators- Nebraska.*

Figure 6: CEI-N Components of Change March 2017

Electricity Sales: 0.20%
Private Wages: 0.00%
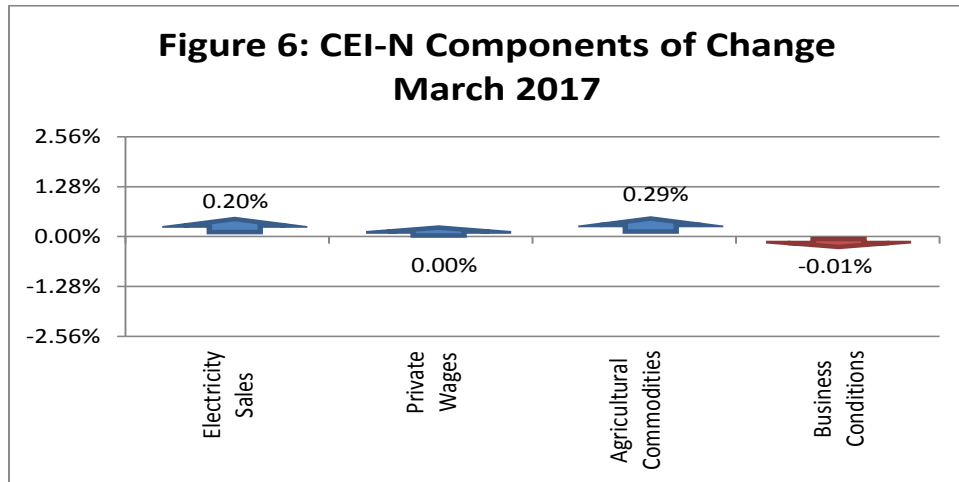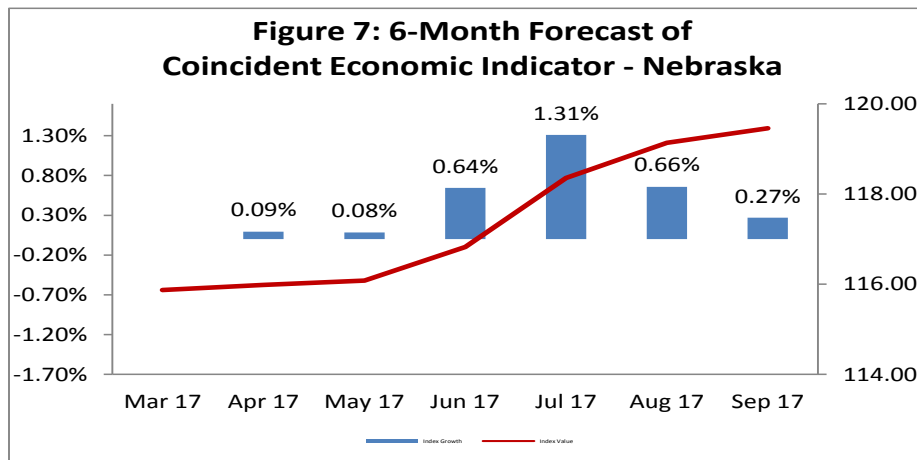Agricultural Commodities: 0.29%
Business Conditions: -0.01%

Figure 7 shows the forecast for the CEI-N over the next six months. Growth is expected to be week in April and May but will turn rapid during the June through September period. These expectations are consistent with recent increase in the value of the LEI-N (Figure 2).

Figure 7: 6-Month Forecast of Coincident Economic Indicator - Nebraska

Month	Index Growth
Mar 17	
Apr 17	0.09%
May 17	0.08%
Jun 17	0.64%
Jul 17	1.31%
Aug 17	0.66%
Sep 17	0.27%

Index Growth | Index Value

Weights and Component Shares

Table 1 shows the weights used to aggregate the individual components into the LEI-N and CEI-N. The weights are the inverse of the "standardized" standard deviation of each component variable. The term standardized simply means that the inverse standard deviations are adjusted proportionately to sum to 1. This weighting scheme makes sense since individual components that are more stable have smaller standard deviations, and therefore, a larger inverse standard deviation. A large movement in a typically stable economic series would provide a more powerful signal of economic change than a large movement in a series that regularly has large movements.

Table 1: Component Weights for LEI-N and CEI-N

Leading Economic Indicator - Nebraska					Coincident Economic Indicator - Nebraska			
Variable	Standard Deviation	Inverse STD	Weight (Inverse STD Standardize)		Variable	Standard Deviation	Inverse STD	Weight (Inverse STD Standardize)
SF Housing Permits	13.3262	0.0750	0.0350		Electricity Sales	4.7322	0.2113	0.1584
Airline Passengers	3.3407	0.2993	0.1396		Private Wages	1.8046	0.5542	0.4153
Exchange Rate	1.2071	0.8285	0.3864		Agricultural Commodities	3.2839	0.3045	0.2282
Initial UI Claims	10.5485	0.0948	0.0442		Survey Business Conditions	3.7833	0.2643	0.1981
Manufacturing Hours	1.6280	0.6142	0.2865					
Survey Business Expectations	4.3045	0.2323	0.1083					

Tables 2 and 3 show the calculation for the change in CEI-N and LEI-N between February and March of 2017. Weights (from Table 1) are multiplied by the change to calculate the contribution of each component. Contributions are converted to percentage terms and summed. Note that in Table 2 a trend adjustment factor is utilized in calculating LEI-N. This is done because LEI-N historically under-predicts CEI-N by 0.10% per month. The U.S. Leading Economic Indicator also has a trend adjustment.

Table 2: Component Contributions to the Change in Leading Economic Indicator

Leading Economic Indicator - Nebraska						
Component Index Value (May 2007=100)						
Component	Current	Previous	Difference	Weight	Contribution	Percentage Contribution (Relative to Previous LEI-N)
SF Building Permits	82.84	88.71	-5.87	0.03	-0.21	-0.16%
Airline Passengers	96.64	97.99	-1.34	0.14	-0.19	-0.14%
U.S. Dollar Exchange Rate (Inverse)	83.46	83.12	0.35	0.39	0.13	0.10%
Initial Unemployment Insurance Claims (Inverse)	152.00	143.09	8.91	0.04	0.39	0.30%
Manufacturing Hours	98.93	98.43	0.50	0.29	0.14	0.11%
Survey Business Expectations[1]	58.22		8.22	0.11	0.89	0.68%
Trend Adjustment					0.13	0.10%
Total (weighted average)	131.70	130.40			1.30	1.00%

[1] Survey results are a diffusion Index, which is always compared to 50

Table 3: Component Contributions to the Change in Coincident Economic Indicator

Coincident Economic Indicator - Nebraska						
Component Index Value (May 2007=100)						
Component	Current	Previous	Difference	Weight	Contribution	Percentage Contribution (Relative to Previous CEI-N)
Electricity Sales	158.26	156.79	1.47	0.16	0.23	0.20%
Private Wage	107.43	107.43	0.00	0.42	0.00	0.00%
Agricultural Commodities	114.56	113.12	1.44	0.23	0.33	0.29%
Survey Business Conditions[1]	49.92		-0.08	0.20	-0.02	-0.01%
Total (weighted average)	115.87	115.33			0.55	0.47%

[1] Survey results are a diffusion Index, which is always compared to 50

Performance of the LEI-N and CEI-N

Further information is available on both economic indicators to demonstrate how well the CEI-N tracks the Nebraska economy and how well the LEI-N leads the CEI-N. Figure 8 shows the value of CEI-N and the real gross state product (real GDP) in Nebraska for 2001 through 2012. Annual real gross state product data is provided by the Bureau of Economic Analysis, U.S. Department of Commerce, and quarterly values were estimated using quarterly earnings data. CEI-N closely tracks Nebraska real GDP for the period. The correlation coefficient between the two pictured series is 0.96.

Figure 8: Coincident Economic Indicator – Nebraska Comparison with Nebraska Real Quarterly GDP
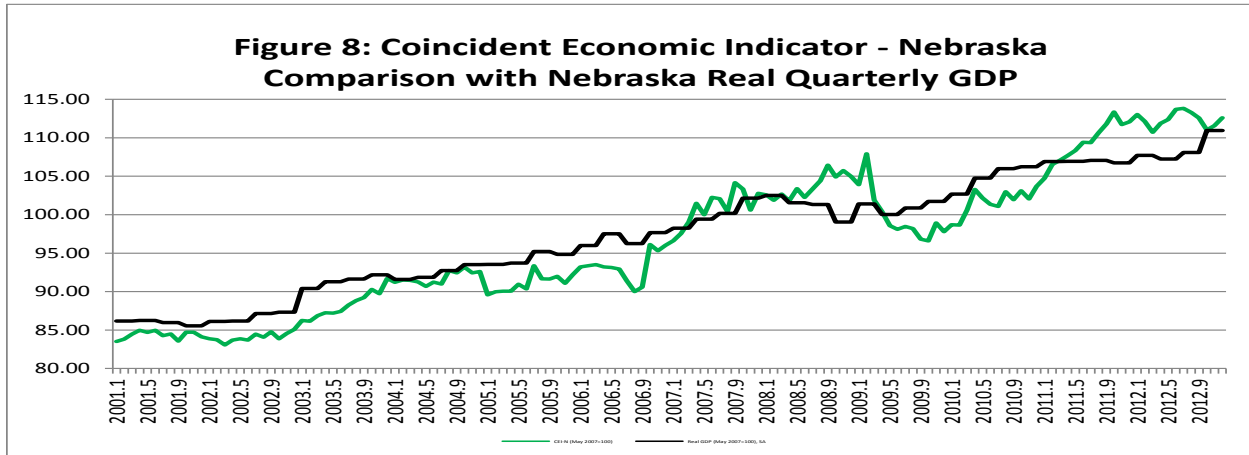
Figure 9 again shows the values for the CEI-N. It also graphs 6-months forward values for the LEI-N. Recall that the LEI-N is intended to forecast the Nebraska economy six months into the future. This implies that Figure 9 is comparing the predicted movement in CEI-N (predicted by LEI-N values six months earlier) with the actual movement in CEI-N. In Figure 9, predicted values using the LEI-N closely track trends and movement in the CEI-N. The correlation coefficient between CEI-N and six-month forward values of LEI-N is 0.91.

Figure 9: 6-Month Forward Value of Leading Economic Indicator - Nebraska Comparison with Coincident Economic Indicator - Nebraska