Texas Metro Business Cycle Indexes: Description and Lessons Learned

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Metro Business Cycle Index Background

• Created indexes for the large metros in Texas and Border Metros
• Used the Stock and Watson, Clayton-Matthews methodology
• Released on the Dallas Fed Web page in May 2009
• Used by Chambers and economic development offices across the state
Business Cycle Index Components

- Adjusted non-farm employment
- Unemployment rate
- Inflation-adjusted total wages and salaries paid (quarterly, delayed by 2-3 quarters)
- Real retail sales (quarterly, delayed by 2-3 quarters) – often leads other data
- Set the trend in border indexes to equal the trend in personal income – could switch to metro RGDP
- Indexes and component data are available on www.dallasfed.org

Texas Non-farm Employment

- Berger, Phillips (July 1993 Southwest Economy ) found statistically significant seasonal breaks in employment
- UI seasonal pattern is different than establishment survey – not present in national data
- Most noticeable in January jump
- Established and applied two-step method for seasonal adjustment that made this series more reliable and less subject to revision
- BLS later established two-step method for state data at broad industry level (applied differently)
- We do the seasonal adjustment at the finest level of detail for Texas and we do broad industries at the MSA level
- Requires a time series of the survey data
Early Benchmark

- Get UI data from Texas Workforce Commission about 4 months after end of quarter
- Percent changes in UI represent good estimates of next benchmark
- Done at state and metro level for all industries that are available from TWC

Early Benchmark Important in Current Analysis and Forecasting
Early Benchmark Helped Spot the Beginning of Recession

Employment has Highest Shares in Metro Indexes

<table>
<thead>
<tr>
<th>Metro</th>
<th>Employment</th>
<th>Retail Sales</th>
<th>Wages</th>
<th>Unemp. Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austin</td>
<td>42.6</td>
<td>16.8</td>
<td>27.5</td>
<td>13.1</td>
</tr>
<tr>
<td>Dallas</td>
<td>68.9</td>
<td>3.4</td>
<td>14.9</td>
<td>12.6</td>
</tr>
<tr>
<td>Fort Worth</td>
<td>68.7</td>
<td>6.2</td>
<td>9.4</td>
<td>15.6</td>
</tr>
<tr>
<td>Houston</td>
<td>91.7</td>
<td>1.9</td>
<td>4.5</td>
<td>1.8</td>
</tr>
<tr>
<td>San Antonio</td>
<td>18.7</td>
<td>7.6</td>
<td>14.9</td>
<td>58.8</td>
</tr>
<tr>
<td>Brownsville</td>
<td>54.9</td>
<td>10.7</td>
<td>11.1</td>
<td>23.3</td>
</tr>
<tr>
<td>El Paso</td>
<td>53.3</td>
<td>4.3</td>
<td>7.9</td>
<td>34.4</td>
</tr>
<tr>
<td>Laredo</td>
<td>40.2</td>
<td>10.1</td>
<td>11.5</td>
<td>38.1</td>
</tr>
<tr>
<td>McAllen</td>
<td>30.3</td>
<td>16.8</td>
<td>31.3</td>
<td>21.5</td>
</tr>
</tbody>
</table>
Austin BCI Moves Like Employment but Not Same

Laredo BCI Much Smoother Than Employment
Academic Applications

- Looked at the relationship between border business cycles and U.S., Texas and Mexico business cycles
- Use correlation, cross-spectral, cluster and regression analysis. Tested for differences after NAFTA.
- Better than using employment or UR
- Interesting to look if BC indexes are more related to tax revenue than job growth

What are they Showing Now?
Border Has Weakened Sharply

Major Metros Beginning to Flatten Out
Also Calculate a Texas Business Cycle Index

Components of Texas Business Cycle Index

- Monthly Texas non-farm employment, Quarterly Texas RGSP and Monthly Texas Unemployment Rate
Cyclical Movements in TCI Aligned with RGSP

The Texas Leading Index
Created in July 1988, Updated in 1990

- Uses traditional DOC/CB methodology except used a bit more statistics to evaluate the components – weighted by inverse of volatility
- **Texas variables** - Average weekly hours in manufacturing, help wanted advertising, real Texas stock index, initial unemployment claims, drilling well permits, real price of west Texas intermediate crude oil
- **International** - Texas export-weighted value of dollar
- **National Factors** - US Leading Index

### Recent Movements in TXLI Components

**Much More Positive**

**Texas Leading Index Components, 2 month change (Apr.-May)**

<table>
<thead>
<tr>
<th>Component</th>
<th>Net Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Change in Texas Leading Index</td>
<td>5.18</td>
</tr>
<tr>
<td>Texas Value of the Dollar</td>
<td></td>
</tr>
<tr>
<td>U.S. Leading Index</td>
<td></td>
</tr>
<tr>
<td>Real Oil Price</td>
<td></td>
</tr>
<tr>
<td>Well Permits</td>
<td></td>
</tr>
<tr>
<td>New Unemployment Claims</td>
<td></td>
</tr>
<tr>
<td>Texas Stock Index</td>
<td></td>
</tr>
<tr>
<td>Help Wanted Index</td>
<td></td>
</tr>
<tr>
<td>Average Weekly Hours</td>
<td></td>
</tr>
</tbody>
</table>

![Graph showing recent movements in Texas Leading Index components](chart.png)
Recent Increase in Leading Index Suggest Jobs Reaching Bottom in Fourth Quarter

Texas Nonfarm Employment and TLI Forecast (with 80% confidence band)

Texas Forecasting Model

- Developed in the early 1990s
- Began publishing in Western Blue Chip publication in 1994
- Simple Transfer Function model of job growth based on past changes in employment and changes in the Texas Leading Index
- Other long-term forecasters include Texas Comptroller, Perryman, Econoclast
Forecasting Performance

• Publication does evaluation of previous year’s forecast
• My forecast has been closest to actual in 8 out of past 13 years
• Next best was Perryman with 2 out of 12
• Best in other, more standard, statistical measures of real-time accuracy

Forecasting Model Does Well By Standard Measures of Error
Why Does Model Perform So Well?

- Good employment data
- Model is parsimonious in parameter estimation
- Texas Leading Index is based on early warning signals not causal factors

Lessons Learned

- State and Metro Business Cycle Indexes Useful
- Since 2005 have been low maintenance – Although I Need to Check Coefficients More Often
- In any project start with Good Data – High Return from Early Benchmark and Two-Step Seasonal Adjustment for Employment Data
- Traditional Leading Index with simple Transfer Function Model Forecasts Accurately for Texas
Thanks!