Texas Metro Business Cycle Indexes: Description and Lessons Learned

September 15, 2009

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Metro Business Cycle Index Background

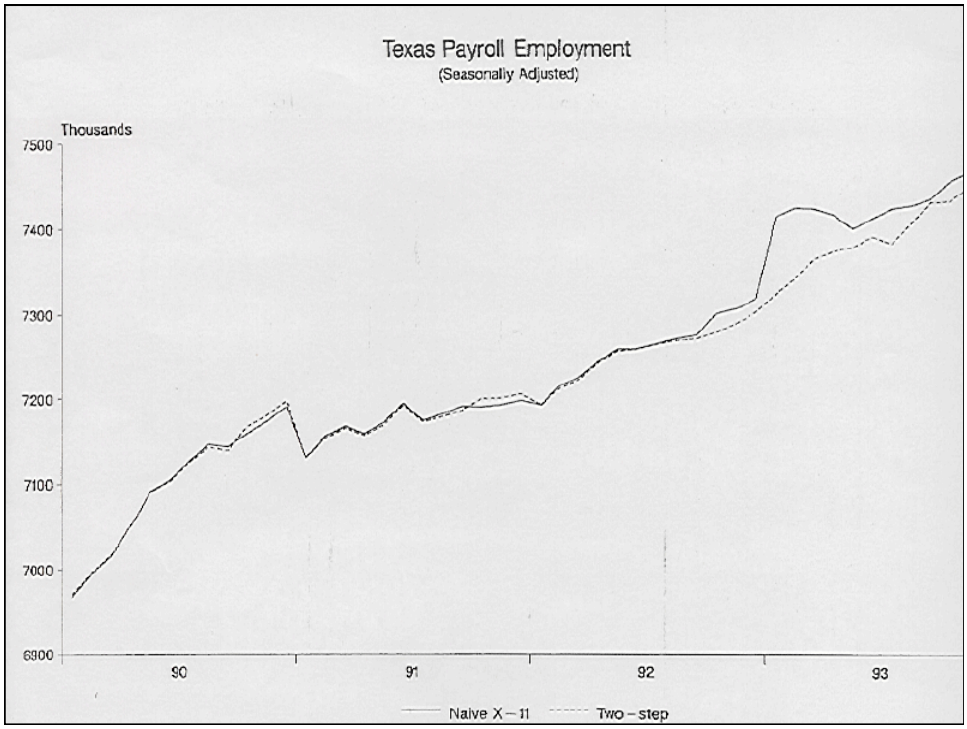
- Created indexes for the large metros in Texas and Border Metros
- Used the Stock and Watson, Clayton-Matthews methodology
- Released on the Dallas Fed Web page in May 2009
- Used by Chambers and economic development offices across the state

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



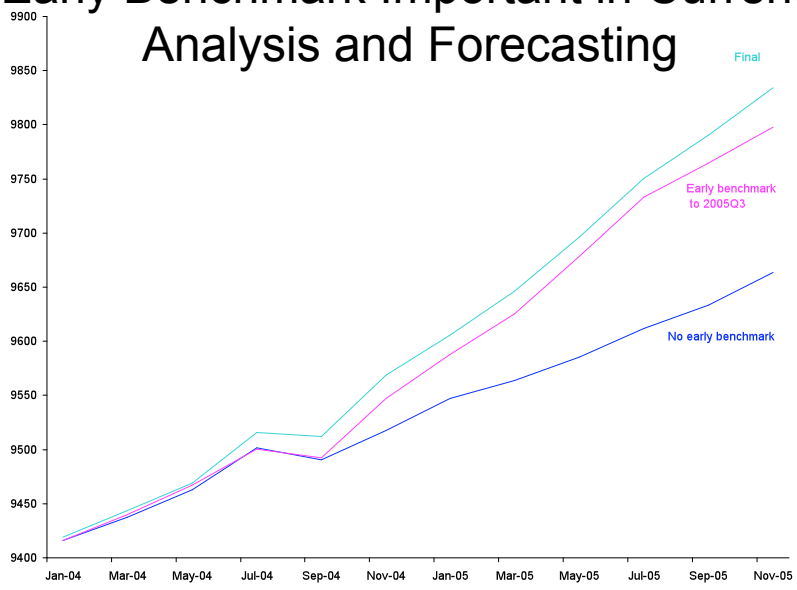
Tests of Seasonal Differences in Unemployment Insurance and Establishment Data

State	Joint F-Statistic	Prob.	T-Statistic for Jan.	Prob.
Alabama	.8280	.6214	1.771	.0783*
Alaska	1.4654	.1410	2.455	.0151*
Arizona	2.8827	.0012*	3.828	.0002*
Arkansas	3.7064	.0001*	4.122	.0001*
California	.1098	.9999	.720	.4722
Colorado	6.4058	.0001*	5.666	.0001*
Connecticut	.9642	.4849	2.436	.0158*
Delaware	1.2236	.2699	2.205	.0288*
D.C.	.4223	.9533	.735	.4632
Florida	4.0937	.0001*	4.486	.0001*
Georgia	4.0516	.0001*	5.199	.0001*
Hawaii	1.1478	.3247	2.529	.0123*
Idaho	3.7633	.0001*	4.592	.0001*
Illinois	1.9335	.0332*	3.322	.0011*
Indiana	2.3309	.0085*	1.674	.0959*
Iowa	10.6669	.0001*	7.706	.0001*
Kansas	5.1580	.0001*	3.247	.0014*
Kentucky	5.9665	.0001*	5.138	.0001*
Louisiana	7.3530	.0001*	5.457	.0001*
Maine	1.4090	.1653	2.488	.0138*
Maryland	3.4942	.0001*	3.752	.0002*
Massachusetts	1.9041	.0365*	3.497	.0006*
Michigan	.5090	.9071	2.109	.0363*
Minnesota	1.0525	.4033	2.039	.0429*
Mississippi	2.7054	.0022*	3.159	.0019*
Missouri	1.7046	.0690*	3.593	.0004*
Montana	3.5030	.0001*	3.722	.0003*
Nebraska	2.3072	.0093*	2.425	.0163*
Nevada	3.5063	.0001*	3.949	.0001*
New Hampshire	.9648	.4843	1.773	.0779*
New Jersey	.8923	.5560	.439	.6613
New Mexico	.8428	.6063	1.041	.2992
New York	2.0672	.0212*	3.685	.0003*
North Carolina	2.7003	.0023*	3.004	.0030*
North Dakota	2.9058	.0011*	4.008	.0001*
Ohio	.8947	.5535	2.519	.0126*
Oklahoma	16.1270	.0001*	.735	.4631
Oregon	3.7308	.0001*	5.841	.0001*
Pennsylvania	1.4357	.1534	2.463	.0147*
Rhode Island	2.3830	.0071*	4.438	.0001*
South Carolina	1.4285	.1565	2.578	.0107*
South Dakota	1.2590	.2468	2.209	.0284*
Tennessee	4.8664	.0001*	5.572	.0001*
Texas	4.6157	.0001*	4.815	.0001*
Utah	.8942	.5540	2.025	.0444*
Vermont	3.5814	.0001*	4.564	.0001*
Virginia	3.1769	.0004*	4.596	.0001*
Washington	3.6974	.0001*	4.551	.0001*
West Virginia	.7725	.6781	1.844	.0669*
Wisconsin	6.4269	.0001*	7.125	.0001*
Wyoming	.9086	.5396	1.237	.2178

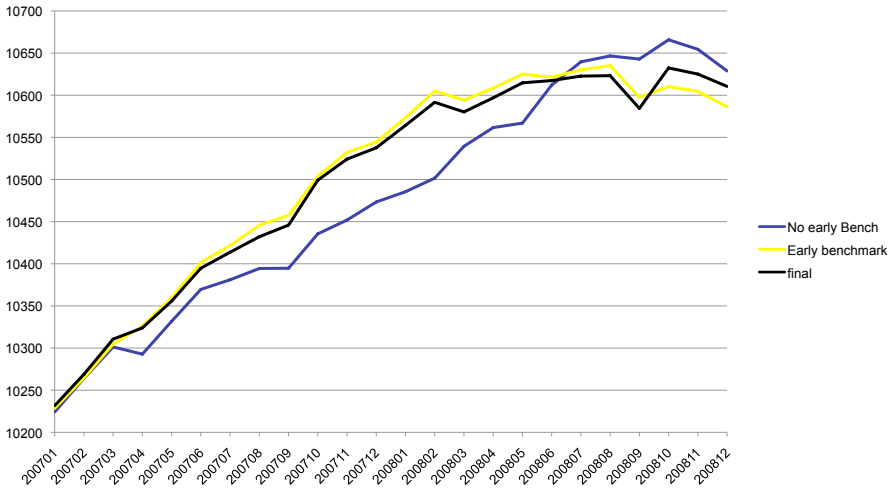
Early Benchmark

- 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



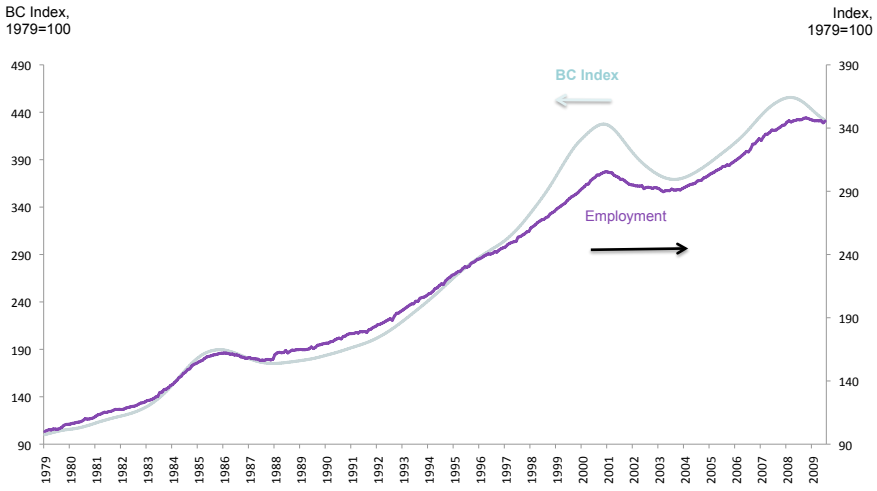
Early Benchmark Helped Spot the Beginning of Recession



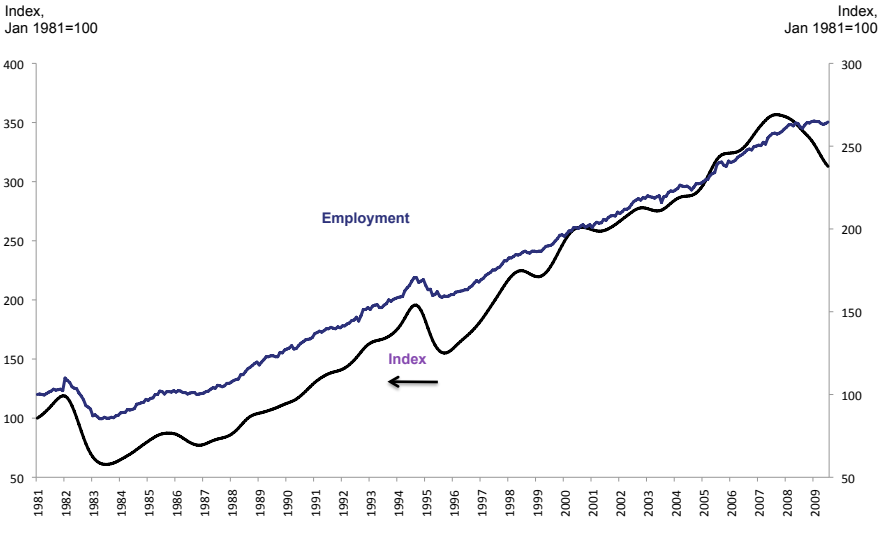
Employment has Highest Shares in Metro Indexes

Metro	Employment	Retail Sales	Wages	Unemp. Rate
Austin	42.6	16.8	27.5	13.1
Dallas	68.9	3.4	14.9	12.6
Fort Worth	68.7	6.2	9.4	15.6
Houston	91.7	1.9	4.5	1.8
San Antonio	18.7	7.6	14.9	58.8
		Border		
Brownsville	54.9	10.7	11.1	23.3
El Paso	53.3	4.3	7.9	34.4
Laredo	40.2	10.1	11.5	38.1
McAllen	30.3	16.8	31.3	21.5

Austin BCI Moves Like Employment but Not Same



Laredo BCI Much Smoother Than Employment

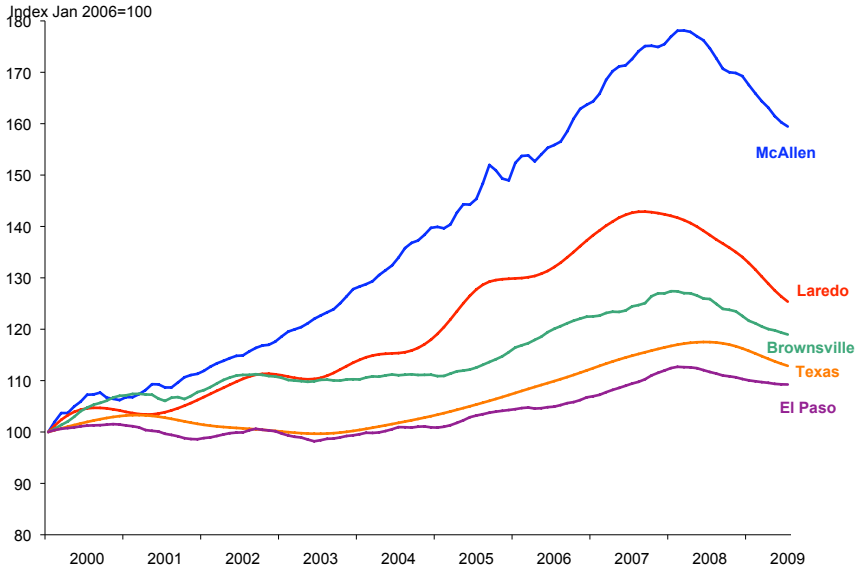


Academic Applications

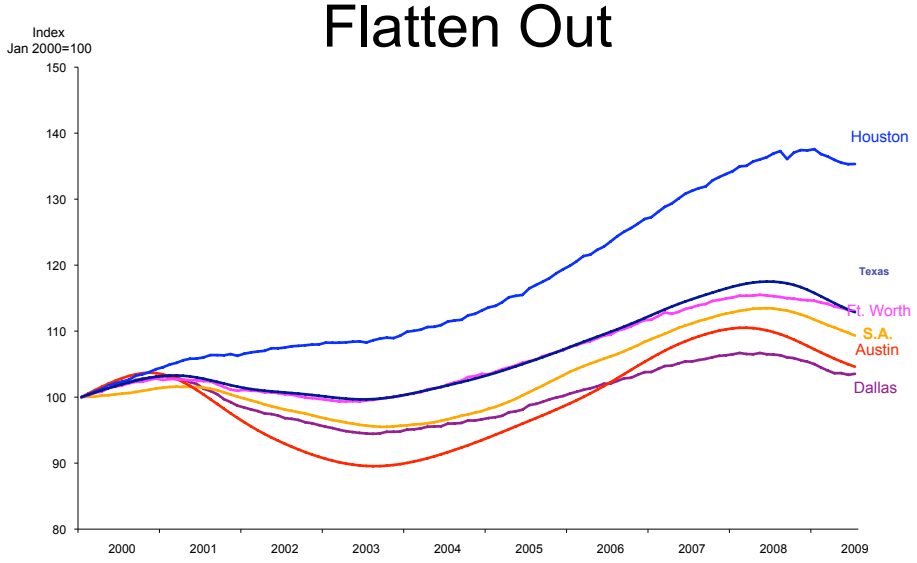
- Looked at the relationship between border business cycles and U.S., Texas and Mexico business cycles
- Use correlation, cross-spectral, cluster and regression analysis. Tested for differences after NAFTA.
- Better than using employment or UR
- Interesting to look if BC indexes are more related to tax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

What are they Showing Now?

Border Has Weakened Sharply



Major Metros Beginning to Flatten Out

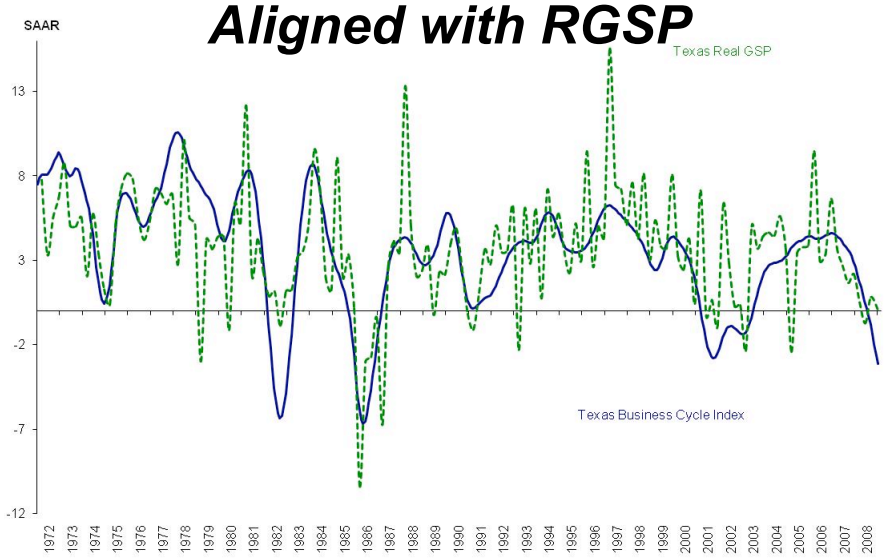


Also Calculate a Texas Business Cycle Index

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



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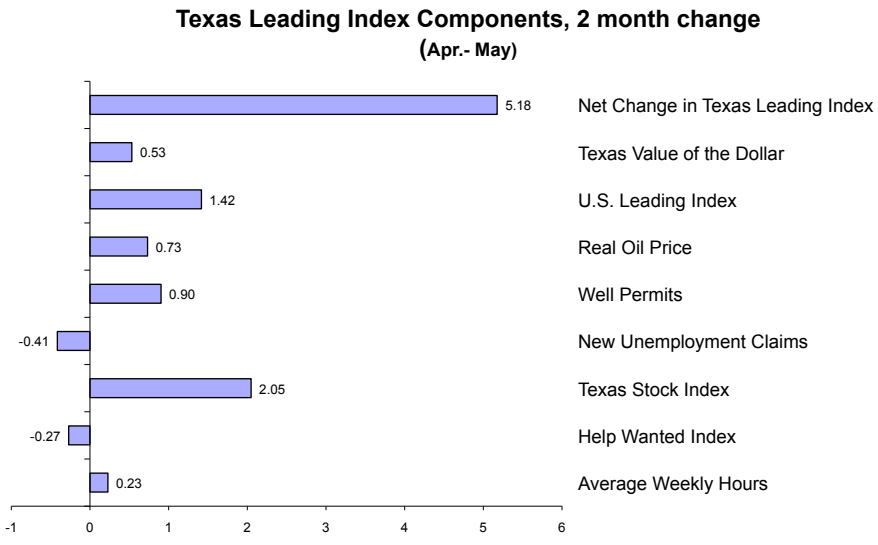
The Texas Leading Index

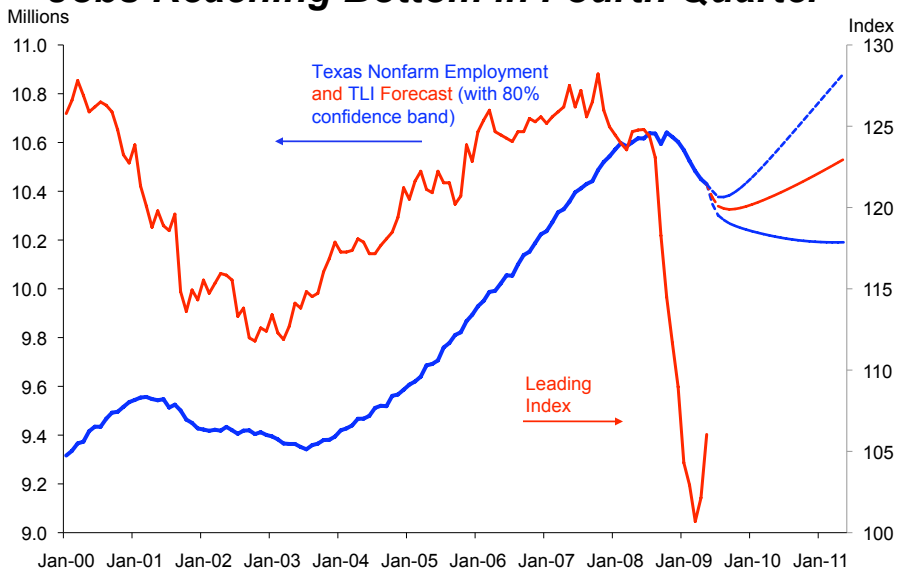
Created in July 1988, Updated in 1990

- 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



Recent Increase in Leading Index Suggest Jobs Reaching Bottom in Fourth Quarter



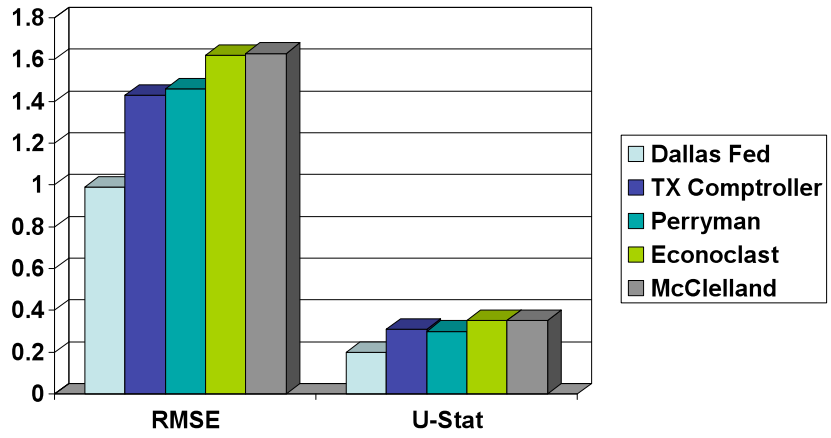
Texas Forecasting Model

- 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 Fuction Model Forecasts Accurately for Texas

Thanks!