

To Adjust or Not to Adjust: A Users' Perspective on Analysis of Economic Trends with Seasonal Data 2nd Seasonal Adjustment Practitioners Workshop

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Presenter



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The Conference Board Selected Economic Indicators & Surveys

- Monthly Indicators:
 - ✓ US Consumer Confidence Index[®] Leading Economic Indexes (LEI): Australia, Brazil, Euro Area, China, France, Germany, India, Japan, Korea, Mexico, Spain, UK, US and Global Economy, Employment Trends Index[™]
- Quarterly Indicators:
 - ✓ Measure of CEO Confidence[™], Global Consumer Confidence Survey
- Other Indicators/Services:
 - ✓ The Business Council Survey – 3x per year
 - ✓ Business & Economics Portfolio – quarterly
 - ✓ Business Cycle Indicators Database – weekly
 - ✓ International Labor Comparisons updates – periodic
 - ✓ Job Satisfaction Survey – annual
- Global Economic Outlook, labor market and consumer research



Overview: Business Cycle Indicators and Seasonal Adjustment

- Business cycles and the problem of seasonality
- Turning points and phase shift problem
- Short-term vs. long-term decision making
- Seasonal adjustment in a global economy
- Potential pitfalls: modeling and real time analysis
- Are improvements to current SA methods possible?



Regular cycles are an enduring feature of economic data....But, some cycles are more regular than others....

“In contrast [to regular and predictable seasonal fluctuations], recurrent slumps that generate declines in sales, production, and incomes along with rises in unemployment clearly belong to the sphere of public interest, and so do recurrent inflationary or speculative booms.”

Zarnowitz (1992) p. 262

- Sales
- Production
- Income
- Employment

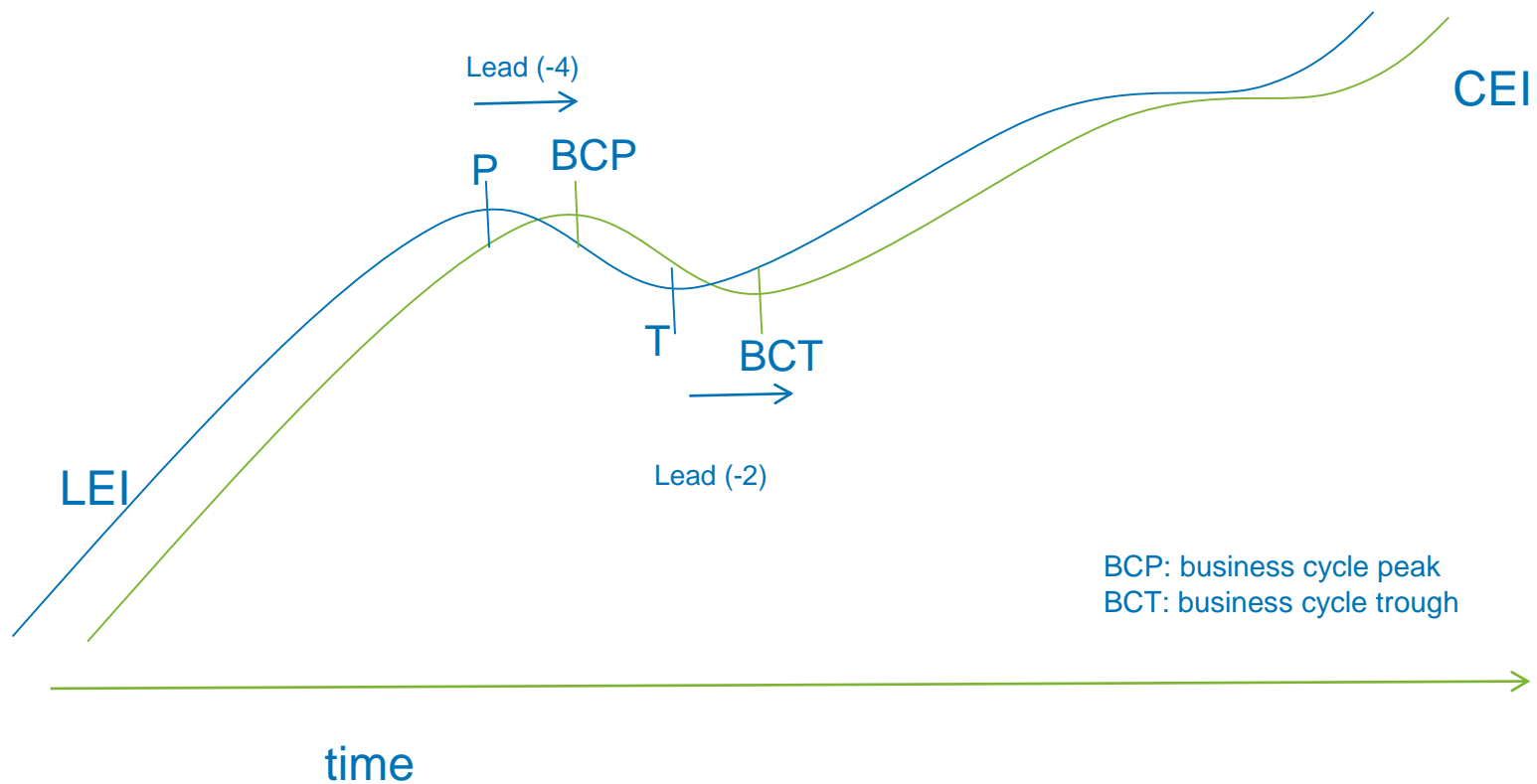


Seasonal fluctuations are a common feature of most economic data

- Intra-year variation that occurs at or about the same point each year -- not necessarily regular, but easily predictable
- Usually caused by exogenous factors:
 - Weather
 - Institutions
 - Holidays (Christmas, Easter, Ramadan, Chinese New Year, etc.)
- Could account for majority of the variation in economic data
- Could be present in every type of economic activity, but not a significant feature of stock prices and interest rates
- Difficult to incorporate into formal economic models due to lack of clear theoretical foundation



Timing in trend-cycle components: leading vs. coincident indicators



Source: The Conference Board

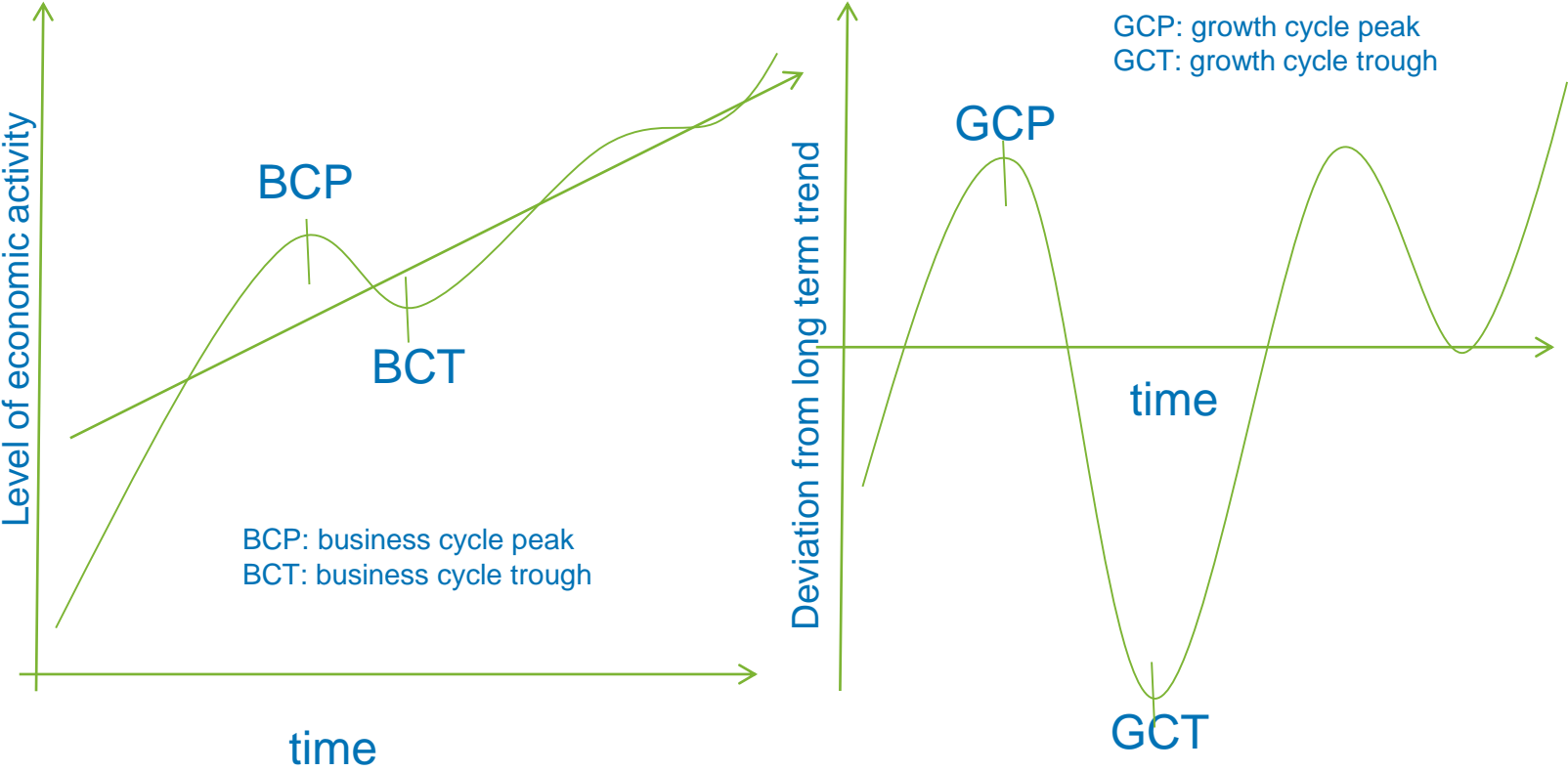


The indicator approach to business cycle analysis of recurring and uniform sequences in economic activity

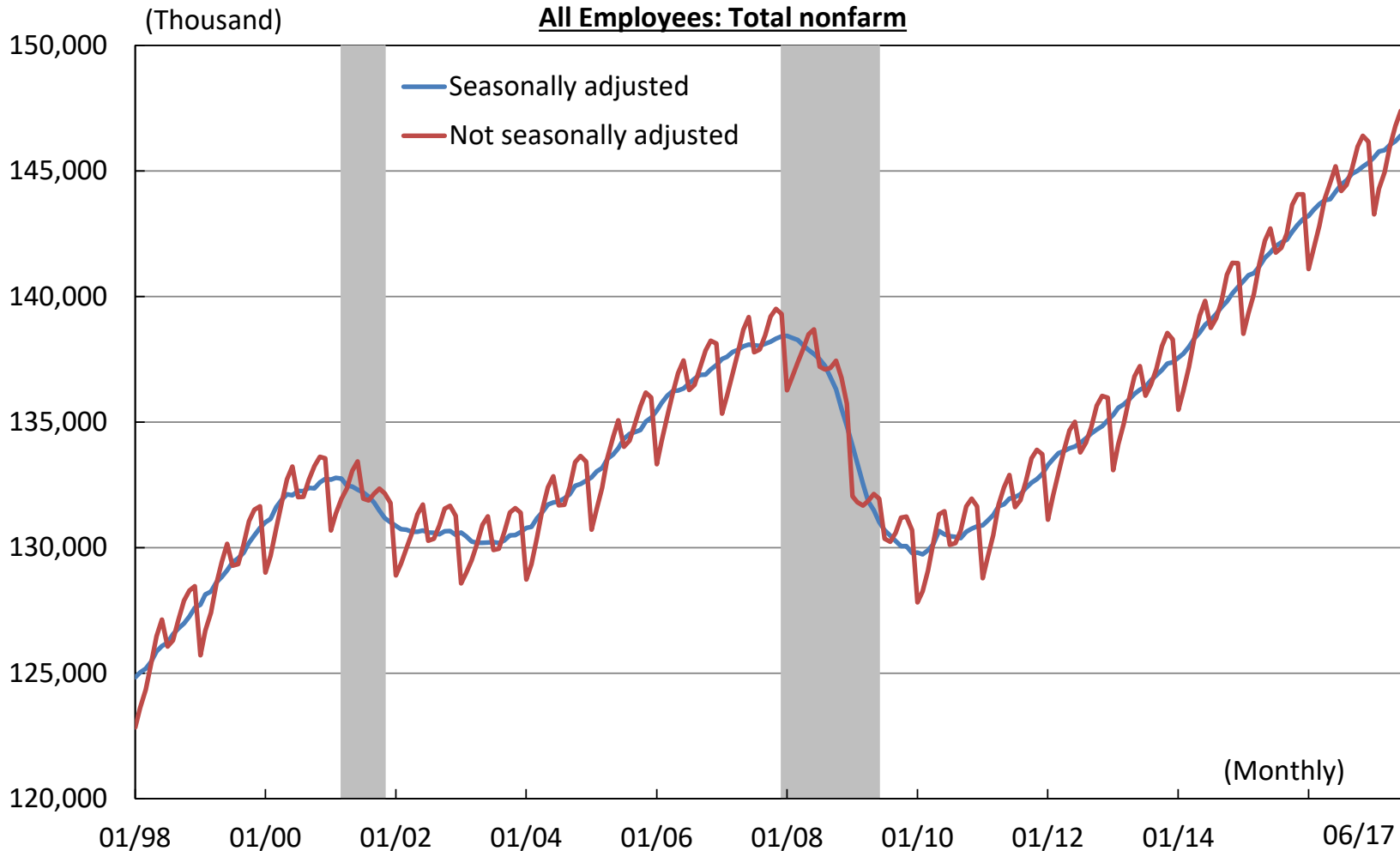
- Relationships between *non-seasonal* part of data is main concern in business cycle analysis
- Sequences are revealed in seasonally adjusted indicators, classified according to cyclical timing
 - ✓ Coincident, Leading, Lagging indicators
- Recurrence of these timing sequences and relationships between types of economic activity
- **Composite indexes** define and predict turning points
 - ✓ The Conference Board Coincident Economic Index[®] (CEI)
 - ✓ The Conference Board Leading Economic Index[®] (LEI)



An important note on: business cycles vs. growth cycles



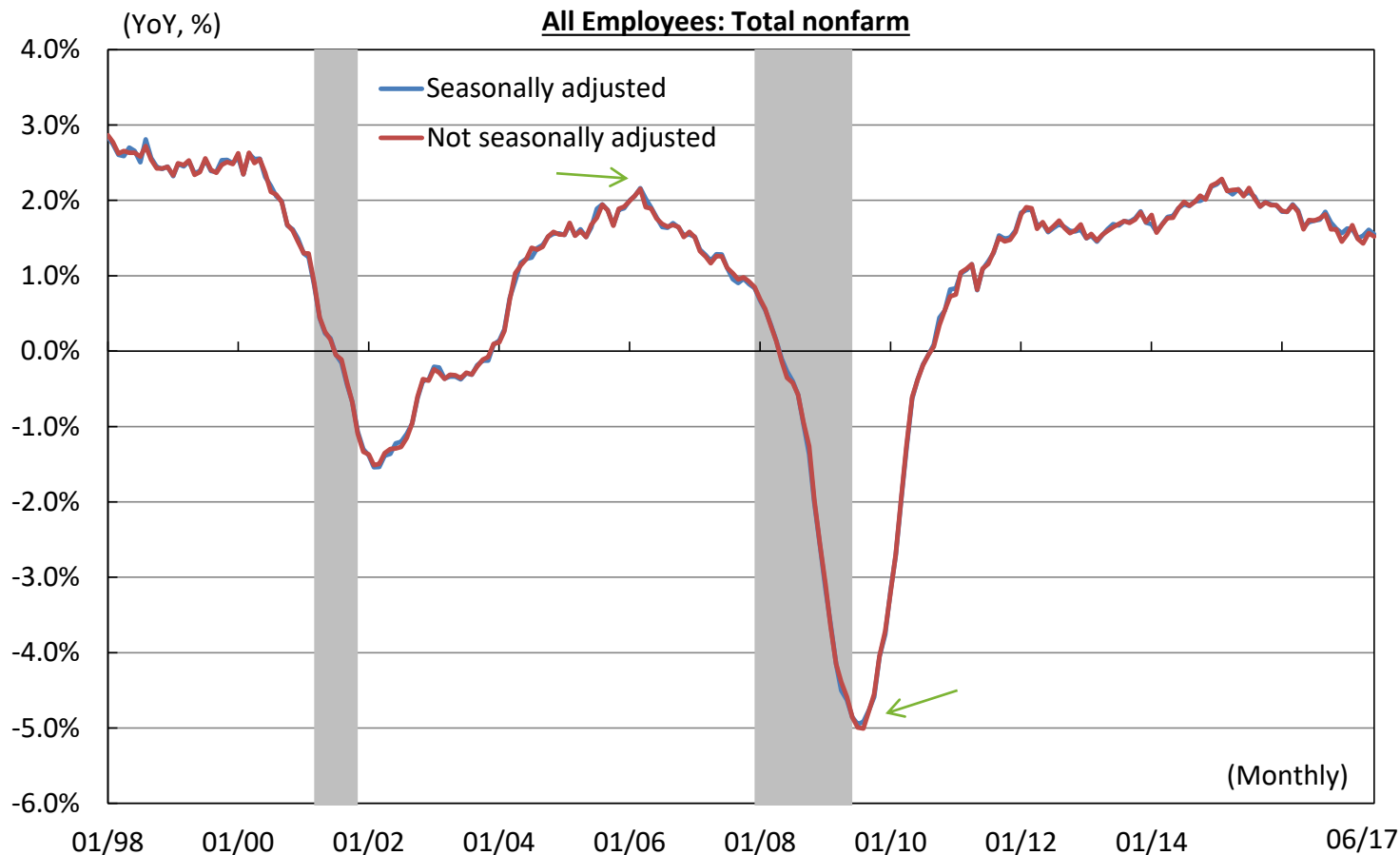
Seasonality accounts for majority of the variation in most indicators of real activity (e.g. payroll employment)



Source: Haver Analytics



Phase shift problem: Simplest seasonal adjustment often used for short term analysis smoothes the data, but ill-equipped for long-term business cycle research



Source: Haver Analytics



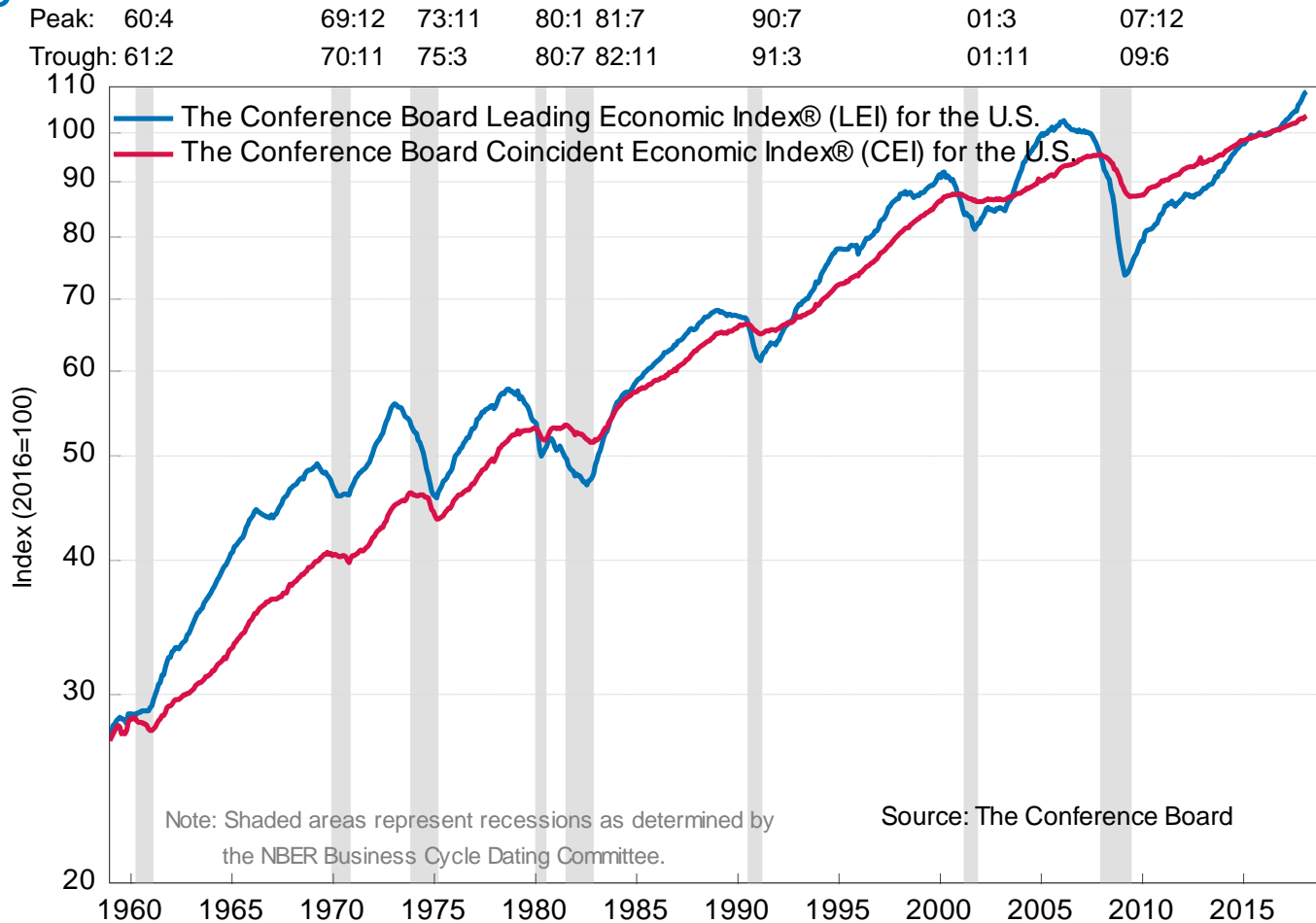
Composite indexes reveal historical business cycles

The indexes

- Bring cycles and turning points into focus
- “Real time” monitoring
- *The components are*
 - ✓ *Seasonally adjusted*
 - ✓ Deflated
 - ✓ Volatility adjusted
 - ✓ Aggregated with equal weights



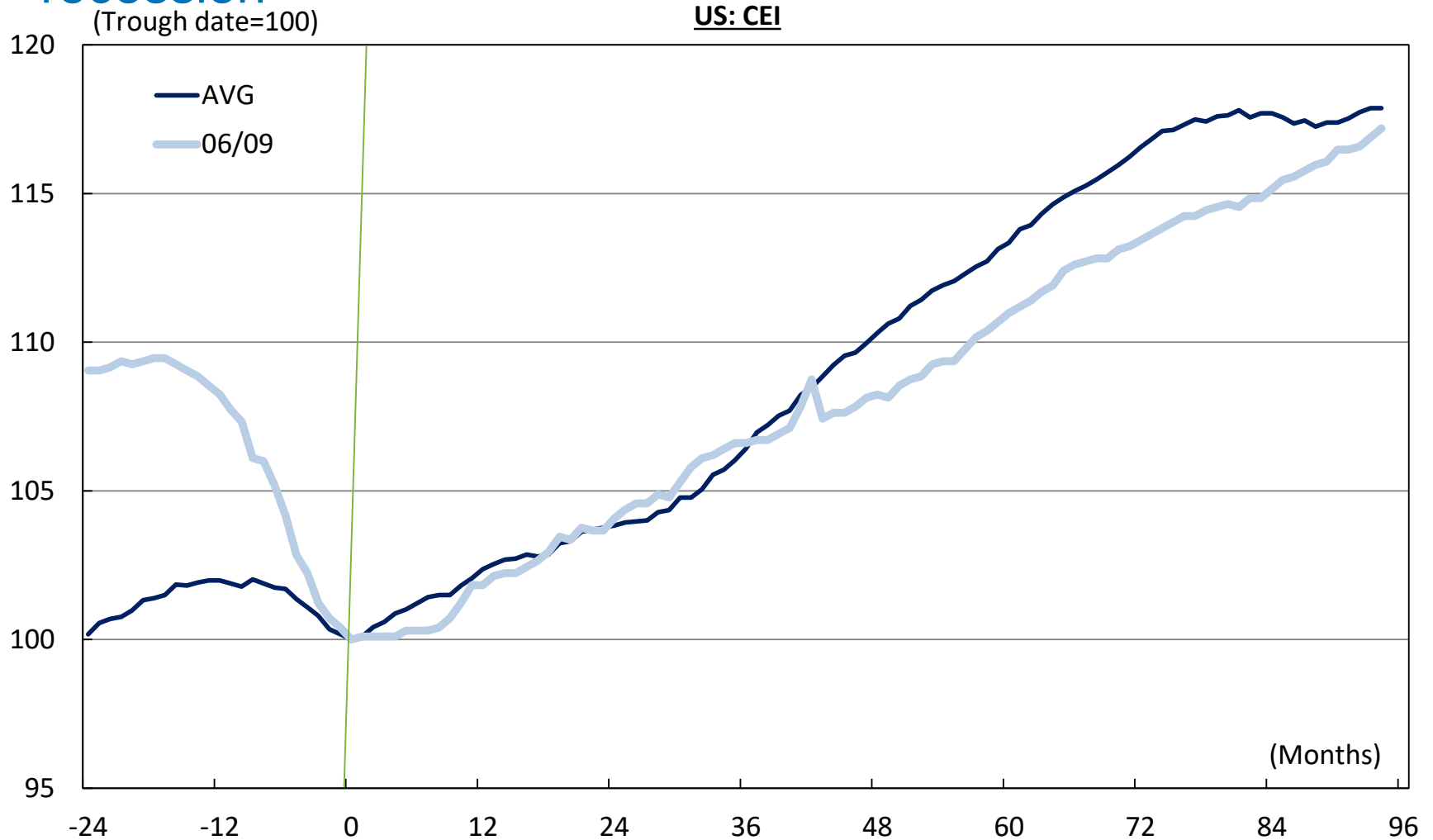
Leading Economic Index summarizes and helps to predict the state of the economy and short term cyclical forces acting in and on it



For more information: <http://www.conference-board.org/data/bcicountry.cfm?cid=1>



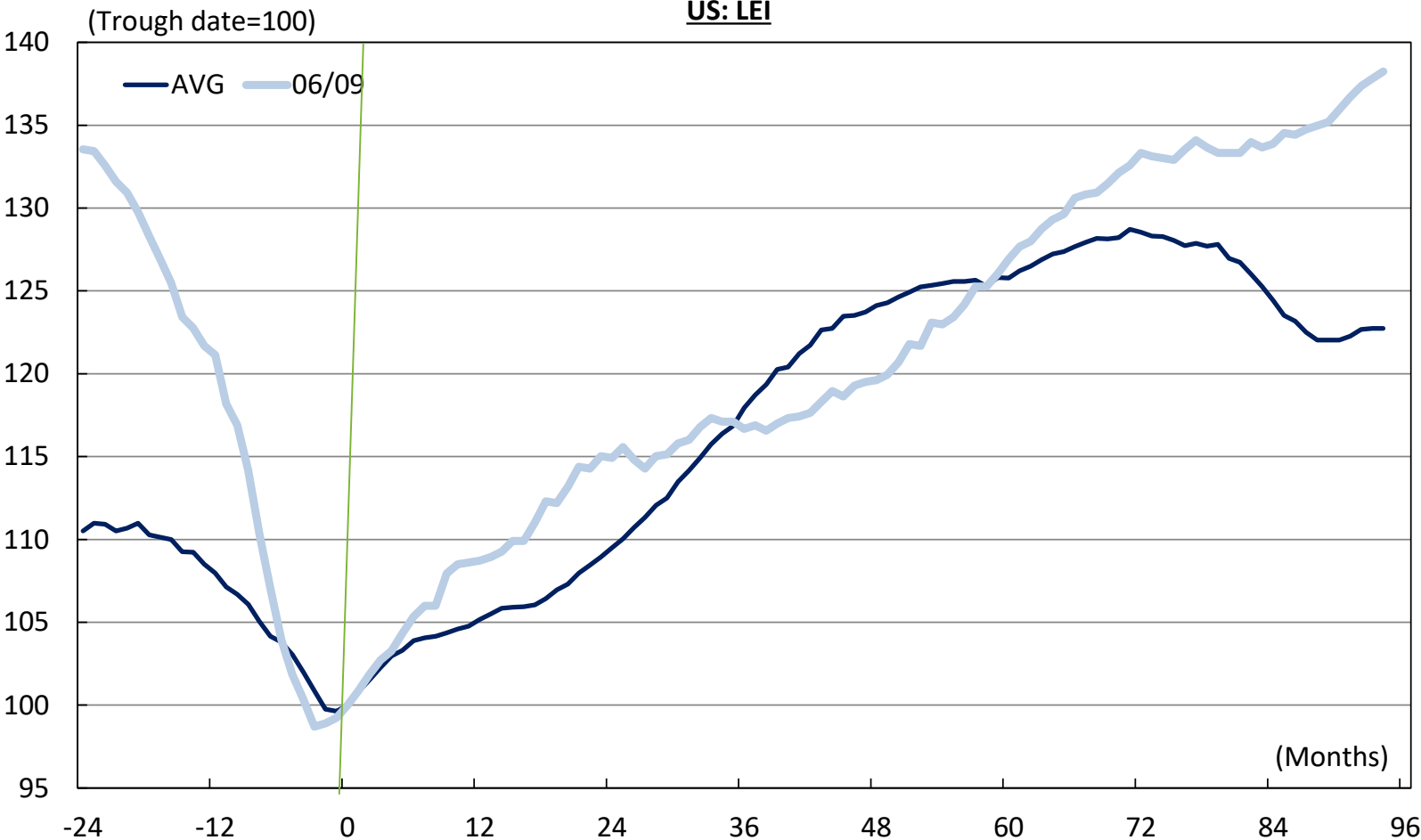
U.S. CEI shows slower than average recovery post great recession



Source: The Conference Board. Recession dates are determined by NBER.



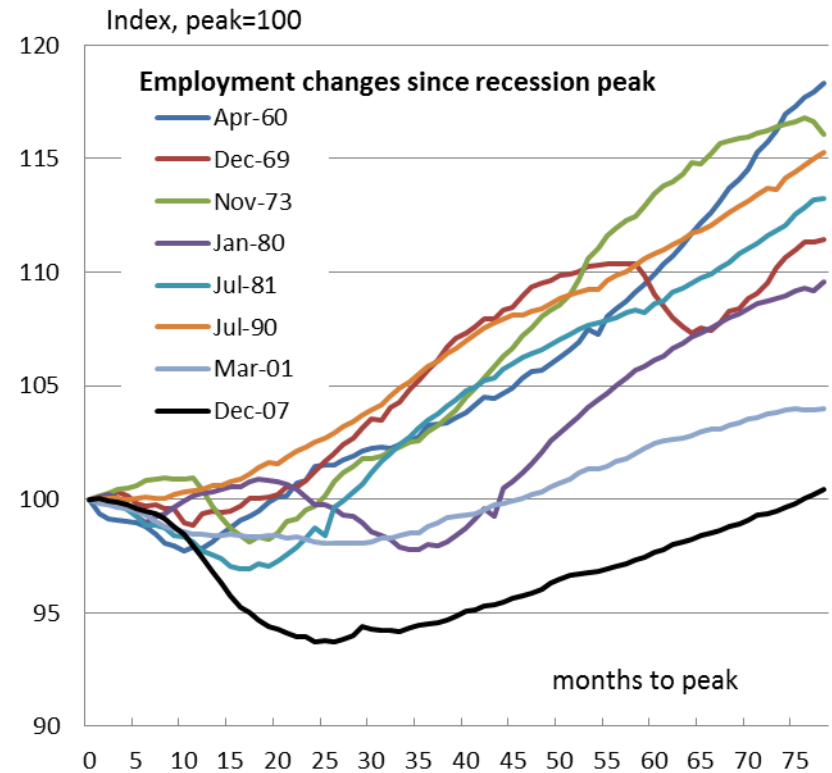
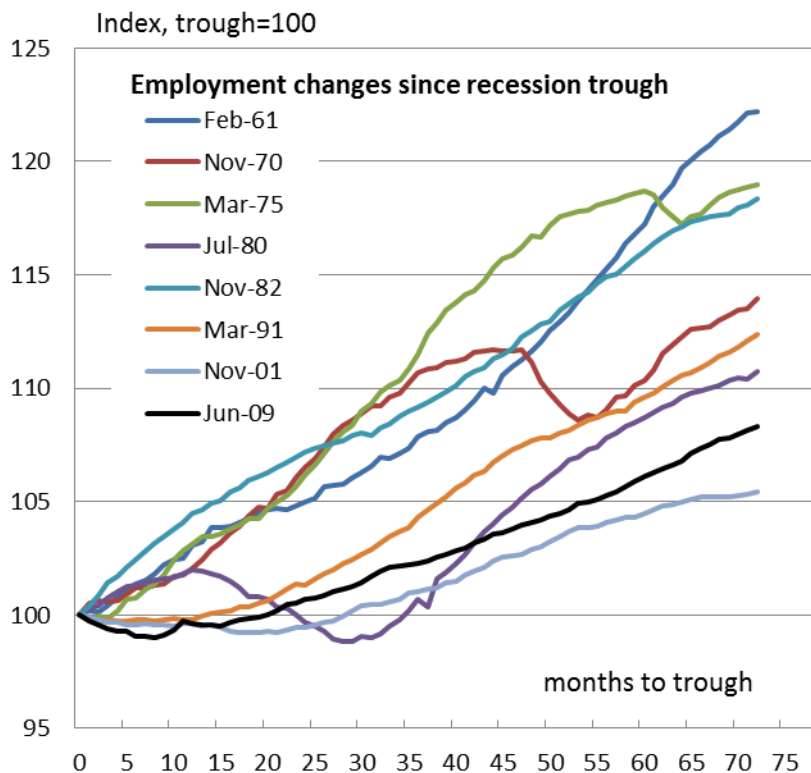
U.S. LEI shows volatile recovery period but no recession signal



Source: The Conference Board. Recession dates are determined by NBER.



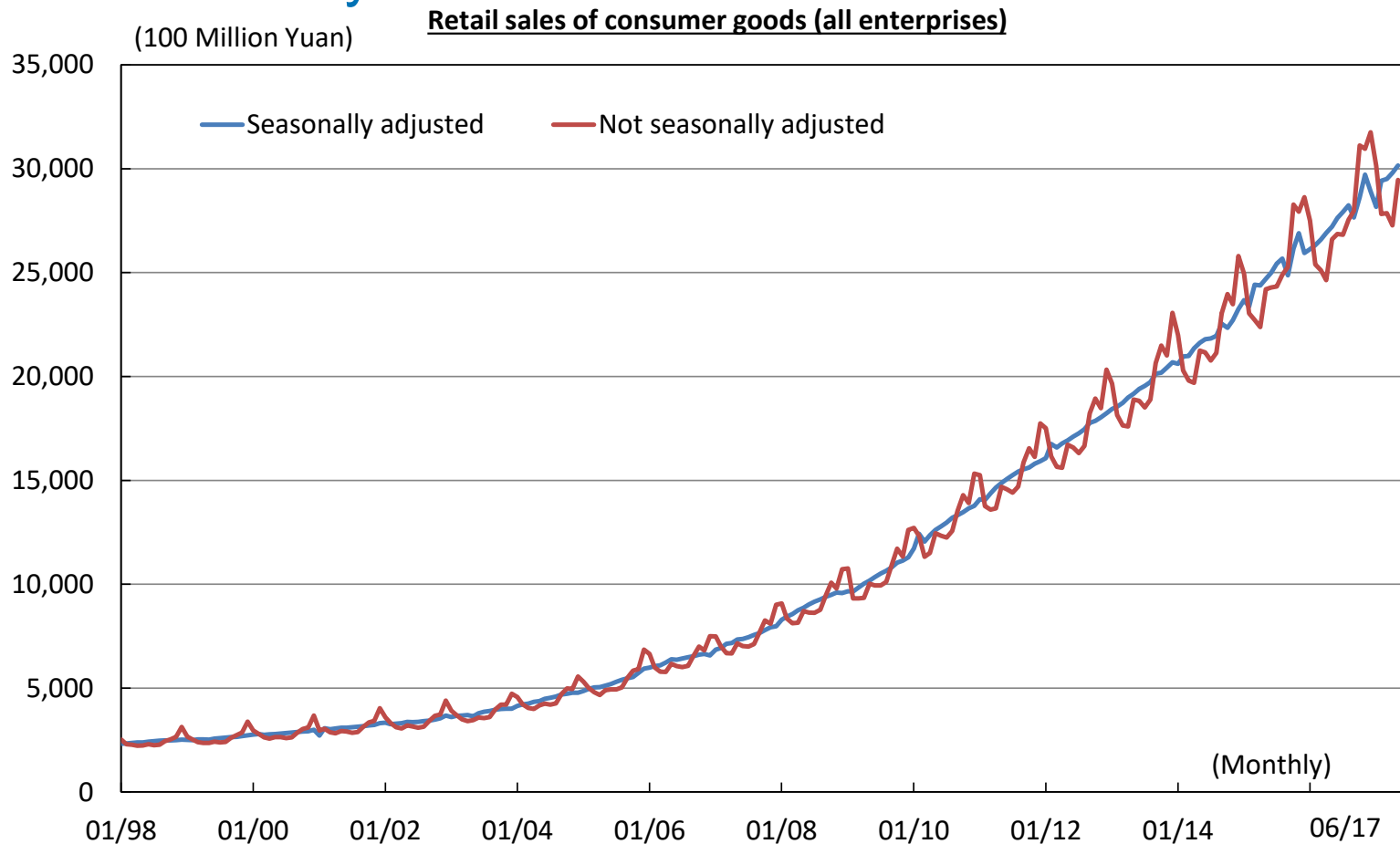
Seasonally adjusted employment provides a better basis for understanding the depth of the recession or the strength of the recovery



Source: Bureau of Labor Statistics



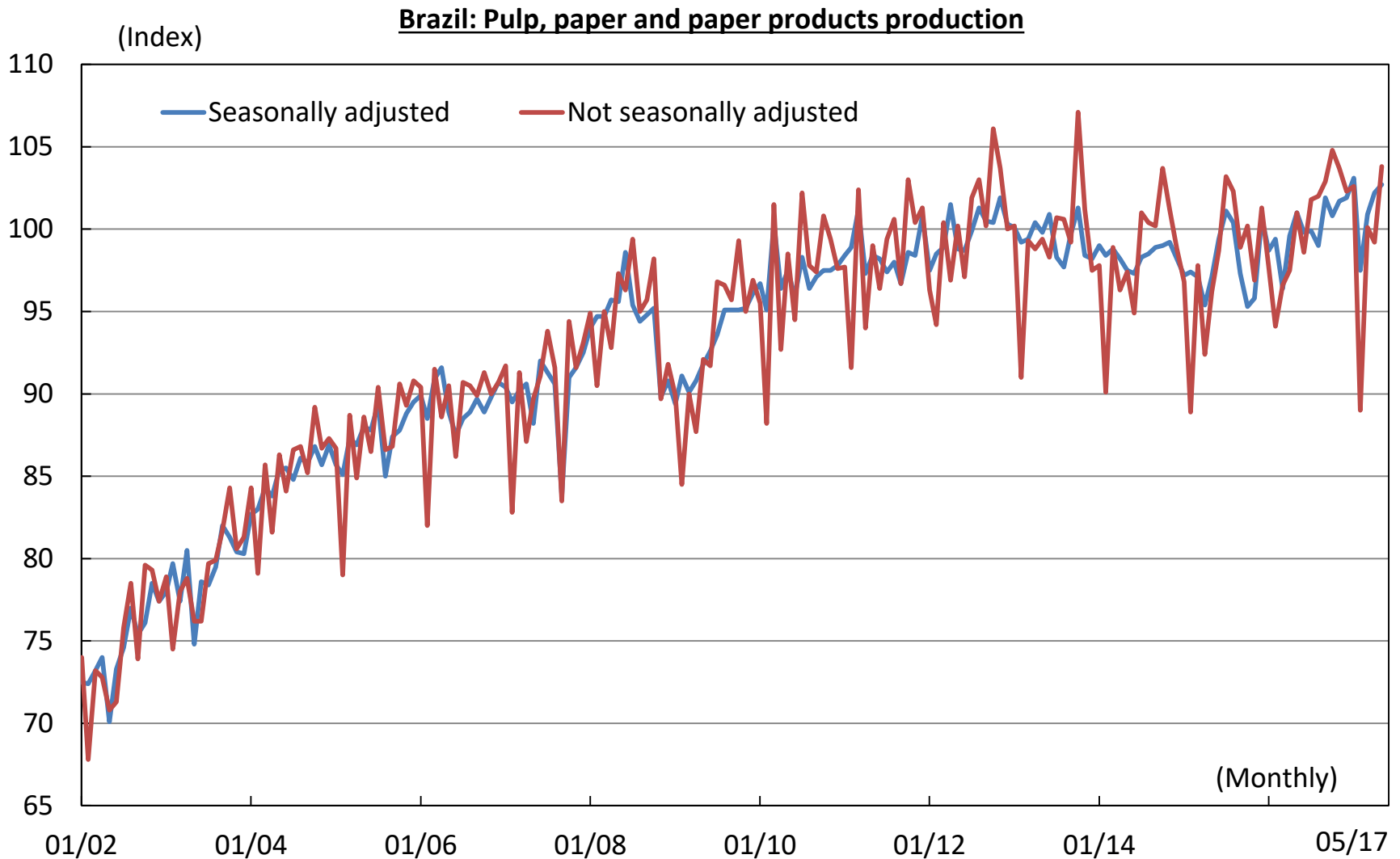
Seasonal adjustment with moving holidays: Chinese New Year has strong patterns and significant effects on China's monthly data



Source: Haver Analytics



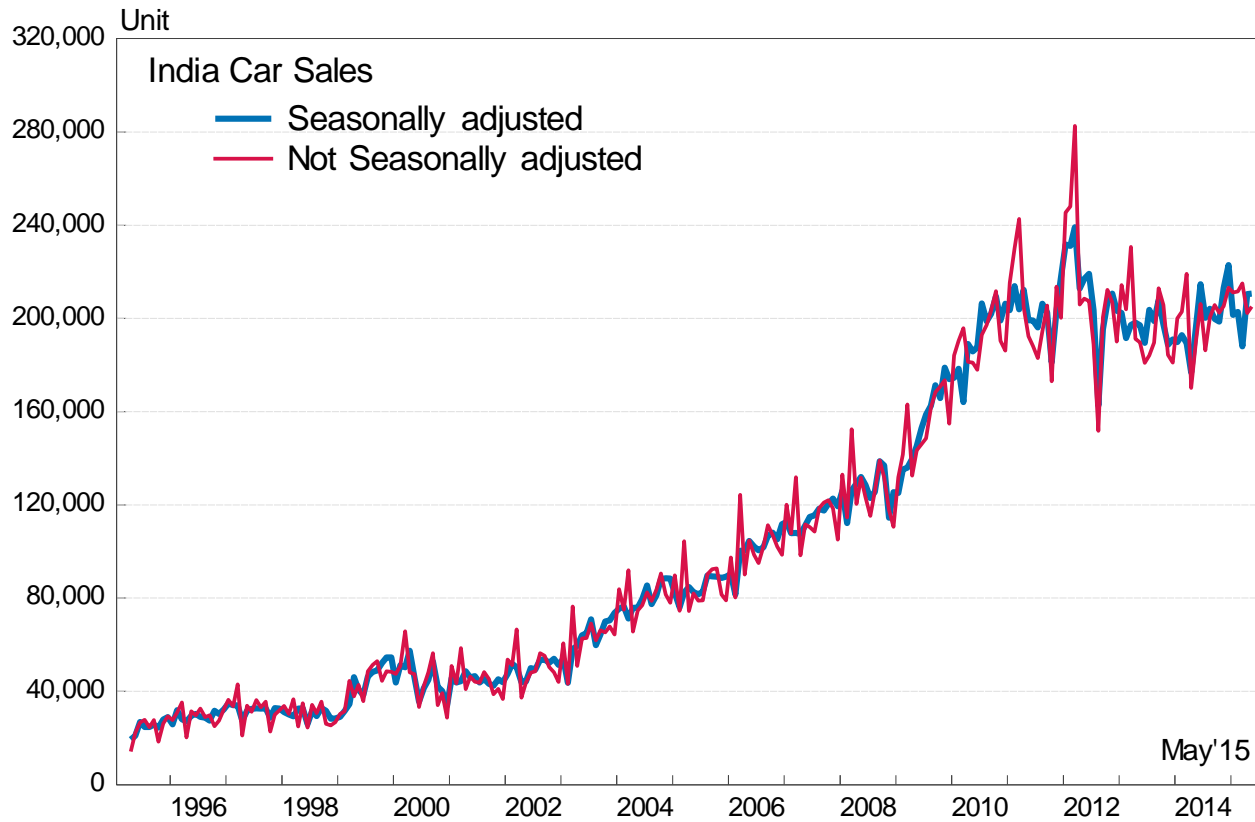
The case of Brazil: series are seasonally adjusted for Carnival



Source: Haver Analytics



Religious holidays (Diwali and Ramadan) were taken into consideration when adjusting India data



Sources: CEIC, The Conference Board



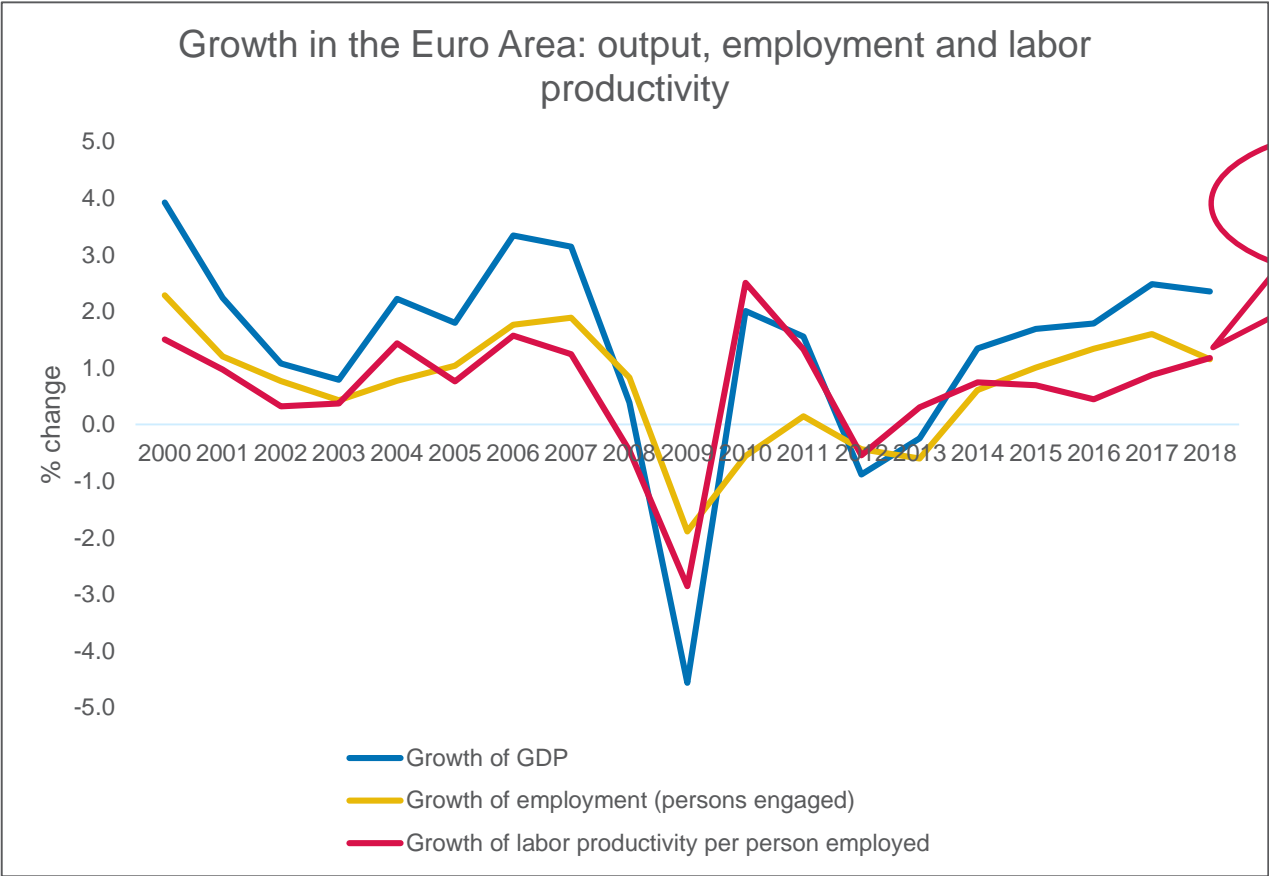
Consistent comparisons across countries



Source: The Conference Board



Consistent comparisons across indicators



Source: The Conference Board, Total Economy Database, March 2018 release

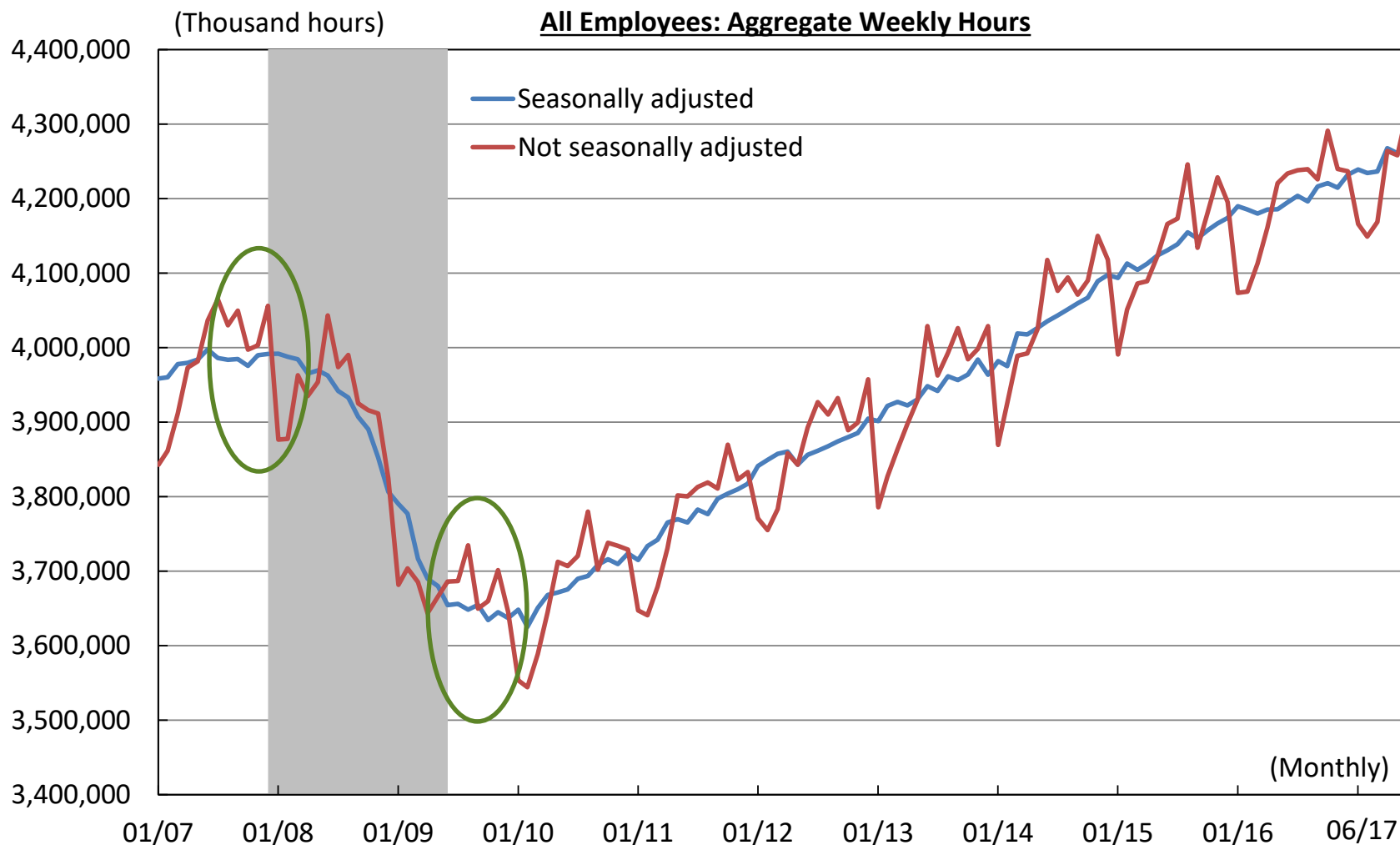


Consequences for modeling and inference

- SA could reduce data quality by introducing estimation errors
- SA could introduce
 - Spurious dynamic relationships
 - Asymptotic biases in parameter estimates of regressions
- One solution: use same seasonal adjustment filter on all variables (Sims, 1974)
- Unadjusted data could overstate dependence between variables due to common patterns in seasonal movements



Seasonality distorts real-time analysis of the underlying strength or weakness of economic trends



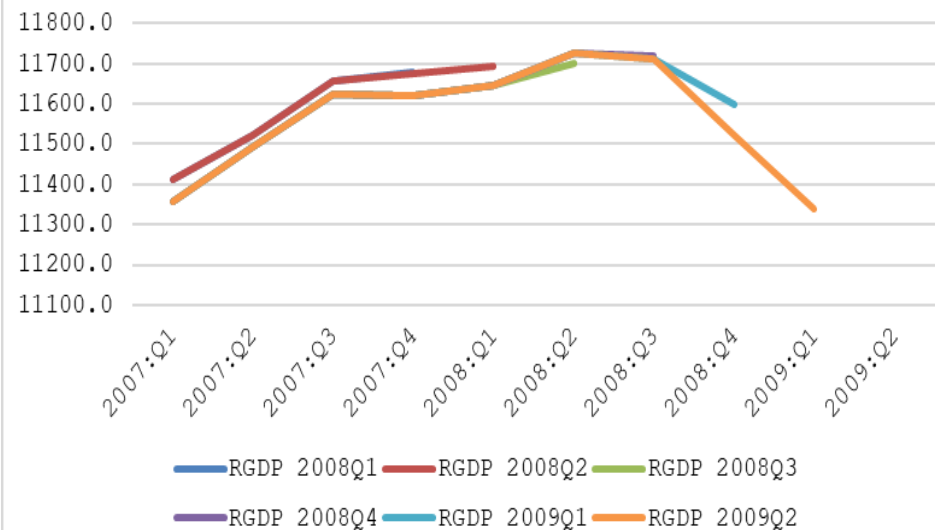
Source: Haver Analytics



Real-time analysis of economic trends is difficult, seasonality would make it doubly so

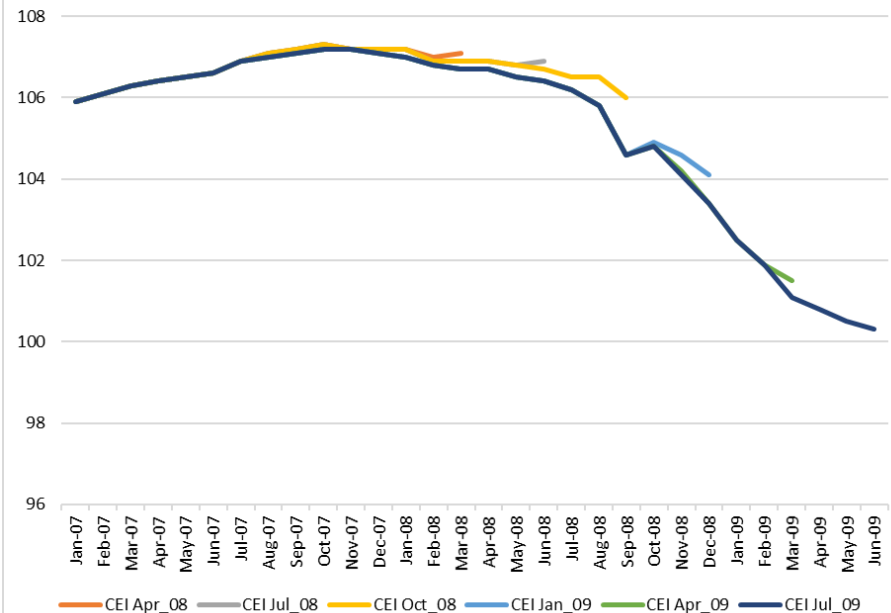
Real GDP, quarterly, real-time

RGDP Vintage Data: Q1 2008 to Q2 2009



Coincident Index, monthly, real-time

US CEI Vintage Data: April 2008 to July 2009



Source: Federal Reserve Bank of Philadelphia

Source: The Conference Board



Consequences for real time analysis

- SA could reduce data quality by introducing estimation errors
- SA could increase frequency and size of data revisions
- Adjusted data could exhibit residual seasonality, moving seasonality, vis a vis disaggregate and aggregate indicators etc.
 - Indirect SA vs. direct SA vs. double SA
- Use both NSA and SA data in current analysis



Summary

- Seasonality is a common and highly predictable feature of economic data
- Seasonal adjustment removes the predictable pattern to reveal the underlying trend and cycle
- Seasonal adjustment is necessary for business and economic analysis
- Seasonal adjustment data is needed to
 - Understand past cycles
 - Predict future cycles
- Ways to improve seasonal adjustment methods
 - Methodological/modeling improvements?
 - Big data to the rescue?



Seasonal adjustment methods and resources

- X-13ARIMA-SEATS Seasonal Adjustment Program
- <http://www.census.gov/srd/www/x13as/>
- <http://www.census.gov/srd/www/x13as/papers4newusers.html>
- Eurostat: <https://ec.europa.eu/eurostat/sa-elearning/conceptual-framework-sa>

