

Discussion of **“To Adjust or Not to Adjust: A Users’ Perspective on Analysis of Economic Trends with Seasonal Data”**

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Overview

- User needs
- Residual seasonality
- How can the producers of statistics better meet user needs?

Why adjust for seasonality?

- Traditional reasons:
 - Helps users to identify business cycles and turning points and with short-term forecasting
 - Allows users to focus on the sources of variation that they are most interested in—economic models, external events, and policy variables
 - To achieve comparability in the series values
- Bell and Hillmer (1984):

“Simplify data so they may be more easily interpreted by statistically unsophisticated users, without a significant loss of information.”

 - However, they would prefer that users model series in terms of the unadjusted data, accounting for seasonality in the model

Risks associated with using seasonally adjusted data

- Increased estimation errors
 - Source of revisions
- Misspecified models
- Fallacious inferences about model parameters
- Poor forecasts
- Poor understanding of role of seasonality in underlying economic structure
- These risks have been known for 40+ years, yet empirical research in macroeconomics continues to be overwhelmingly based on seasonally adjusted data.

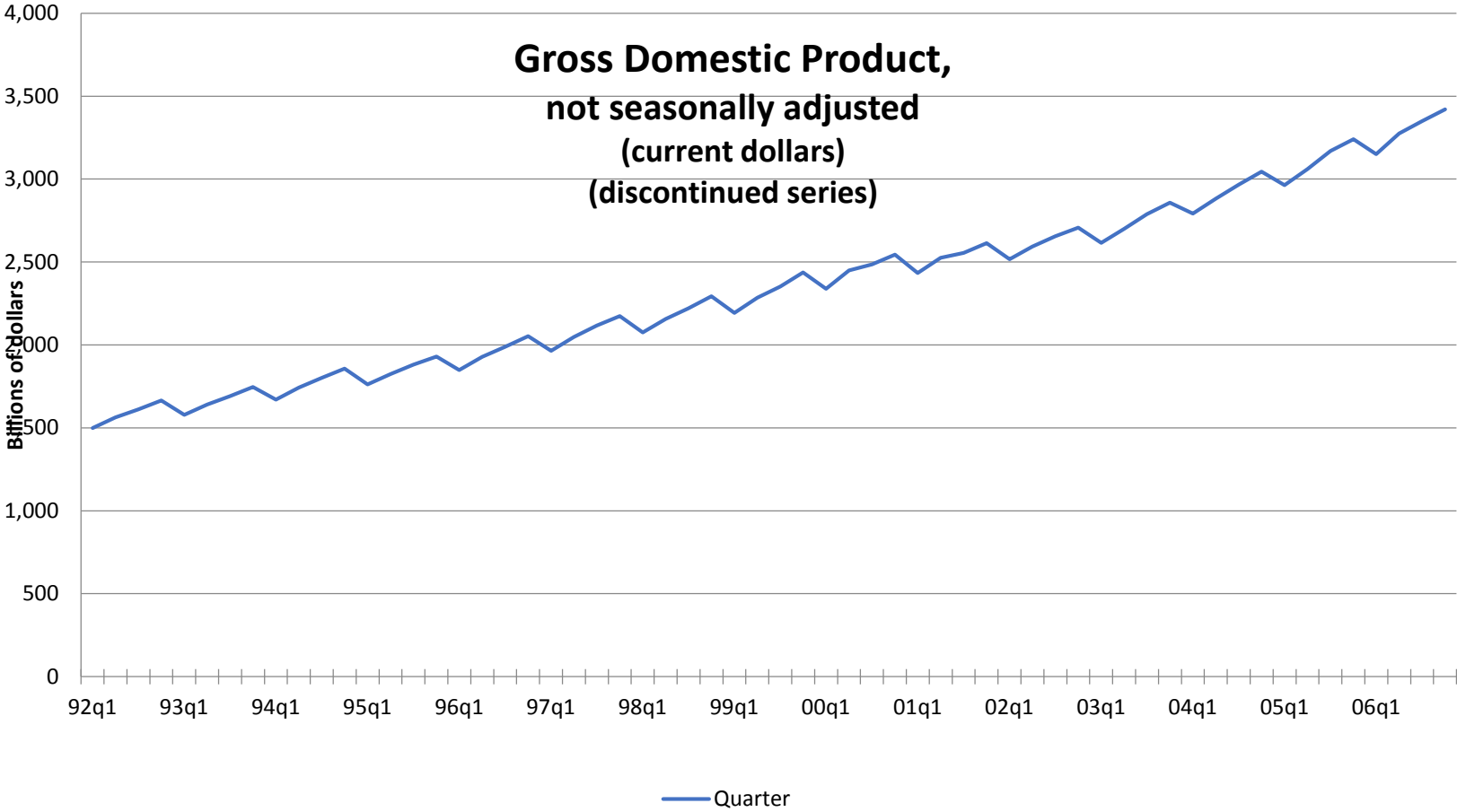
Other adjustments – weather, leap years, etc.

- Seasonal adjustments account for typical weather patterns, but not for deviations from weather norms.
- *2015 Economic Report of the President:*
“Cold weather played a major role in depressing GDP in the first quarter [of 2014]; in fact, it was the third most unusually cold quarter in the past 60 years. Four snowstorms in the first quarter were severe enough to be rated on the Northeast Snowfall Impact Scale...The bad weather appears to have reduced many of the weather-sensitive components of GDP.”
- Boldin and Wright (2015, *Brookings Papers on Economic Activity*) propose methods for adjusting for unusual weather.
- Leap years are another example of a regular, calendar-related factor that can be folded into the methodology of seasonal adjustment

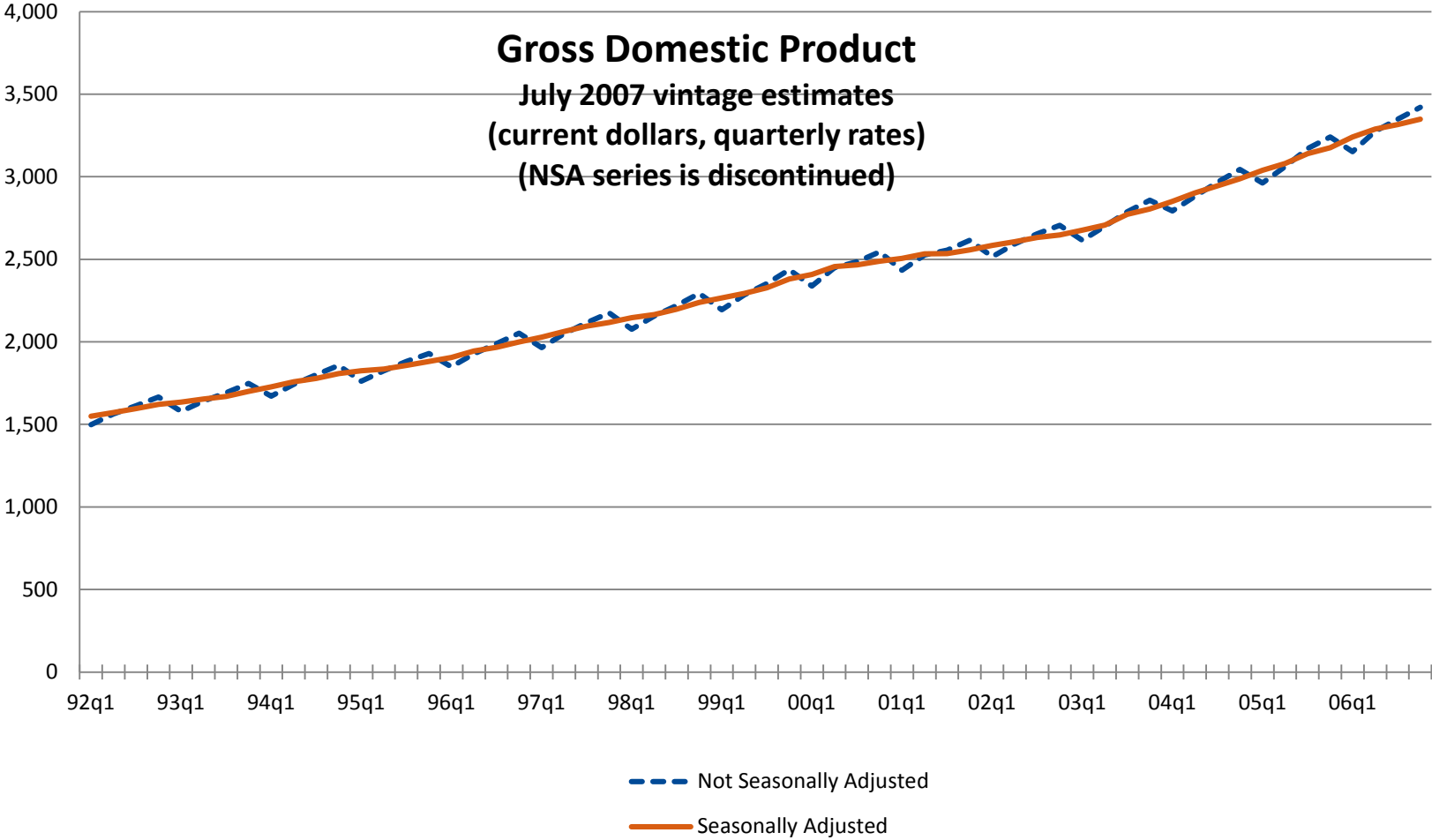
Residual seasonality

- For many national statistics, users want the aggregation of SA sectoral data to be consistent with SA totals
- Consequently, agencies often derive SA national series indirectly as the sum of SA component series
- Risk of residual seasonality in the aggregate series
- For GDP, residual seasonality has been associated with weakness in first quarter growth.
 - Moulton and Cowan (2016, *Survey of Current Business*)

Gross Domestic Product, NSA (discontinued)



Gross Domestic Product, 1992–2006



Causes of residual seasonality in GDP

Two main factors causing residual seasonality were identified:

1. Use of monthly source data to estimate quarterly GDP components
 - Monthly series may not exhibit seasonality and isn't seasonally adjusted, but seasonal when aggregated to quarterly frequency
 - *Or*, series that is seasonally adjusted at monthly frequency may exhibit residual seasonality when aggregated to quarterly frequency
 - Solution involves examining series at both monthly and quarterly frequency

Causes of residual seasonality in GDP

2. Revisions to seasonal adjustment factors not shown consistently in time series due to revision practices that limit the number of years open to revision
 - Moving averages – new data lead to revisions in seasonal factors for several years
 - BEA national income and product accounts traditionally revise most recent 3 years except for comprehensive (benchmark) updates
 - Some Census indicators only revise SA estimates for years with revised annual data
 - Solution involves changing revision practices to allow revisions to SA estimates for longer periods
- BEA's comprehensive update scheduled for July 2018 will change methodologies to address these problems and reinstate NSA GDP estimates – see April 2018 *Survey of Current Business*

What could statistical agencies do to help meet user needs?

- Improve transparency about seasonal adjustments
 - Example – BLS posts the specification files used to produce SA employment data
- Be willing to produce alternative seasonal adjustments, acknowledging methodological uncertainty and alternative uses of the data
 - Example – Provide series based on both direct and indirect SA methods
- Provide guidance for users who would consider incorporating seasonality into regression or other models for dynamic economic analysis

Thank you!