

Overview of Time Series Issues and Research at the U.S. Census Bureau

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Disclaimer

This report is released to inform interested parties of research and to encourage discussion. The views expressed on statistical issues are those of the author and not necessarily those of the U.S. Census Bureau.

Software Development

1. Software Modernization

- ▶ Create X-13ARIMA-SEATS API
- ▶ Explore replacing Fortran code with C, C++

2. SigEx: Multivariate Signal Extraction R Routines

- ▶ High frequency applications
- ▶ Refined models (canonical models)
- ▶ Forecasting
- ▶ Wiener-Kolmogorov signal extraction
- ▶ Standard errors

3. R package *seasonal* and *x13story*

- ▶ Interface X-13ARIMA-SEATS and R, Joint work with package author Christoph Sax
- ▶ Simple markdown format to document and disseminate seasonal adjustment problems

Research Projects

1. Multivariate Time Series Analysis

- ▶ Multivariate Seasonal Adjustment
 - Refining the models, handling estimation and computation, interpretation of resulting filters, studying the benefits
- ▶ Cointegration testing
- ▶ Multivariate band-pass filtering
- ▶ Test statistics on collinearity of time series, as a methodology for classifying and jointly modeling seasonal time series
 - We have method-of-moment estimators and test statistics, and also a fully nonparametric approach through the multivariate spectral density
- ▶ Ongoing research into estimation with VARMA processes, including LASSO estimation and investigation of post-model selection inference

Research Projects Con't

2. Model and Seasonal Adjustment Adequacy
 - ▶ Model residuals
 - ▶ P-values of spectral peaks
3. Direct-Indirect SA: GDP consultation
 - ▶ Residual seasonality seen after aggregation
 - ▶ Addressed through variant of optimal raking methodology of Quenneville, using SA adequacy as a constraint
4. Seasonal vector form and the RSVD
 - ▶ Handles structural break in seasonality
5. Research into space-time seasonal adjustment, where trend and seasonal patterns are governed by a spatial structure
6. Influence of weather on Seasonal Adjustment

Thank you.

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