

X-13ARIMA-SEATS and iMetrica

Brian C. Monsell*

U. S. Census Bureau, Washington, DC, brian.c.monsell@census.gov

Christopher Blakely

U. S. Census Bureau, Washington, DC, christopher.blakely@census.gov

This paper will give the latest developments in two ongoing software projects. One is a joint collaboration with the current developers of the SEATS seasonal adjustment program, X-13ARIMA-SEATS, which was officially released by the Census Bureau in 2012. This program combines the seasonal adjustment and modeling modules of the X-12-ARIMA program with the model-based seasonal adjustment module from SEATS. This program allows producers of seasonally adjusted series to generate X-11 and SEATS seasonal adjustments using the same interface, and compare these seasonal adjustments using a common set of diagnostics. The second is a software system named iMetrica, which is a unique GUI oriented software for both simulating and modeling from many different types of time series models. This software package focuses on speed, user interaction, visualization tools, and point-and-click simplicity for building models for time series data of all types and is written entirely in GNU C and Fortran with a rich interactive interface written in Java. One powerful feature that is unique to the iMetrica software is the innate capability of easily combining both model-based and non-model based methodologies for designing data forecasts, signal extraction filters, or (non)nested model comparison strategies. Furthermore, the strategies can be computed and tested both in-sample and out-of-sample using a built-in data partitioner that effectively partitions the data into an in-sample storage where models and filters are computed and then an out-of-sample storage where new data is applied to the in-sample strategy to test for robustness, over-fitting, and many other desired properties. This gives the user complete liberty in creating a fast and efficient test-bed for implementing signal extractions and forecasting regimes. This paper will demonstrate how SEATS adjustments are integrated into the X-13ARIMA-SEATS procedure and give examples of new diagnostics and modeling options, including some designed for use in modeling the recent recession, as well as a description of the five interacting time series analysis modules that comprise iMetrica. These include modules for X-13ARIMA-SEATS, unobserved component modeling, and state space modeling.

Key Words: Signal extraction, likelihood statistics, empirical mode decompositions, model comparison.