Title:

Efficiency Gains for Seasonal Adjustment by Joint Modelling of Disaggregated Series

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Abstract:

The focus of this research is on examining how the accuracy of seasonally adjusted time series can be improved by using the sub-series. A model-based approach to seasonally adjusting an aggregated series is carried out with two different methods. The first method utilizes an univariate basic structural model (BSM) for the aggregated series. The second method utilises a multivariate basic structural model for the sub-series. In basic structural models, the series components are modelled individually, and then put into state space form. The Kalman filter is applied to obtain estimates of the aggregate series components and the prediction mean squared errors. The variance of the seasonally adjusted series given by the two methods is studied through their relative efficiency. A particular emphasis of the research is on how the similarity of and differences between disaggregated series affect the efficiency of the two approaches to seasonal adjustment. The impact of the length of the time series on the accuracy of seasonally adjusted series is also considered.

A single indicator measure is developed for predicting whether the properties of the disaggregated series (or sub-series) will lead to gains in the accuracy of the seasonally adjusted aggregated series. The quasi-likelihood method is applied to obtain the indicator measure of relative efficiency. It is shown to be directly related to the relative efficiency measure obtained with the Kalman filter.