Removing Residual Seasonality from GDP

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Abstract

We seek to remove residual seasonality (RS) from U.S. Gross Domestic Product (GDP) and its sub-aggregates, such that the accounting relations between the various sub-components of GDP are preserved. We pursue a reconciliation method that minimally modifies each monthly time series such that its higher aggregates – as well as its aggregation to a quarterly frequency – have no RS, enforced through a nonlinear optimization scheme where seasonal adjustment diagnostics enter as nonlinear constraints. The aggregation relations of the GDP components have a graphical tree structure, and we propose a top-down approach that moves from the trunk to the leaves of the tree.

Outline

1. Motivation from economic time series: meager and ample data
2. Point measures and Poisson random measures
3. Doubly stochastic Poisson random measures
4. Marked point processes and meager flows
5. Sampling, warping, and change of measure
6. Simulating trend and seasonality