A model based approach for benchmarking seasonally adjusted time series

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When economic time series are seasonally adjusted directly, a number of the original connections between them are destroyed. However, it is desirable that seasonally adjusted aggregates and underlying variables are aligned perfectly. It is also desirable that seasonally adjusted time series are perfectly aligned to original annual totals. One way to restore the connections is by using a benchmarking model.

The paper presents a multivariate benchmarking model based on Denton’s movement preservation principle. The model consists of an optimisation algorithm under restrictions. The main characteristic of this algorithm is that seasonally adjusted quarter-to-quarter movements are preserved as much as possible while the connection is restored. Simultaneously, all accounting rules applicable are satisfied. The algorithm uses reliability weights in order to deal with quality differences of seasonally adjusted time series.

Benchmarking models are flexible enough to restore the original connection and simultaneously deal with additional requirements. Of course, it is also important to test the applicability of the model in practice and analyse the quality of the results. The model is illustrated with an empirical application on Dutch economic time series of quarterly GDP and its underlying variables. The problems we encountered in practice will be discussed in this paper.