

TURKISH STATISTICAL INSTITUTE

SEASONAL ADJUSTMENT

What is seasonal adjustment?

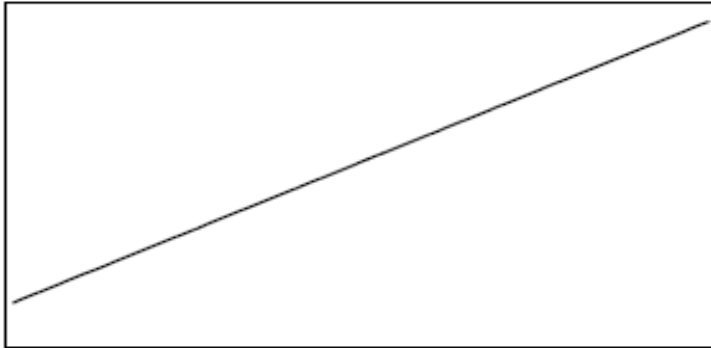
- ➔ Seasonal adjustment is a technique that is aiming for estimating and removing systematic (e.g. seasonality) and calendar related movements from the time series.
- ➔ Raw series are seasonally adjusted to identify important features of economic series such as direction, turning points, and consistency between other economic indicator by removing seasonal fluctuations and calendar effects which can mask short and long term movements in a time series.

Components Of Time Series

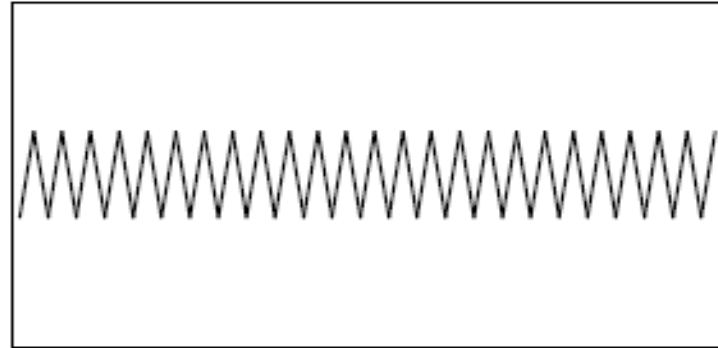
- ➔ Trend-cycle (long term movements), TC
- ➔ Seasonal (movements that occur on a regular basis), S
- ➔ Irregular (movements which are unpredictable), I
- ➔ Additive time series;
$$X_t = TC_t + S_t + I_t$$
- ➔ Calendar Effect
 - ➔ Working day or Trading-day (effect of different days of the week)
 - ➔ Moving holiday (date changes systematically over time: Easter, Ramadan, ...)

Examples

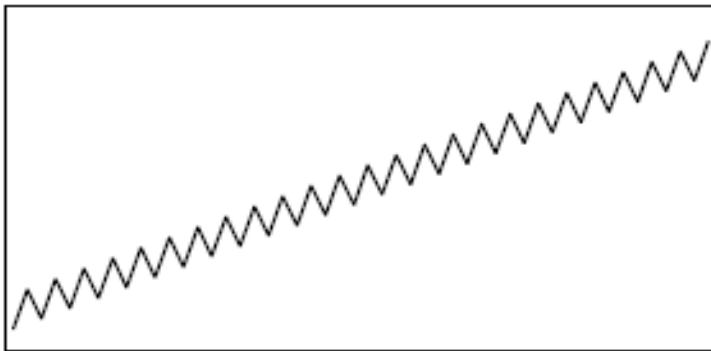
Trend



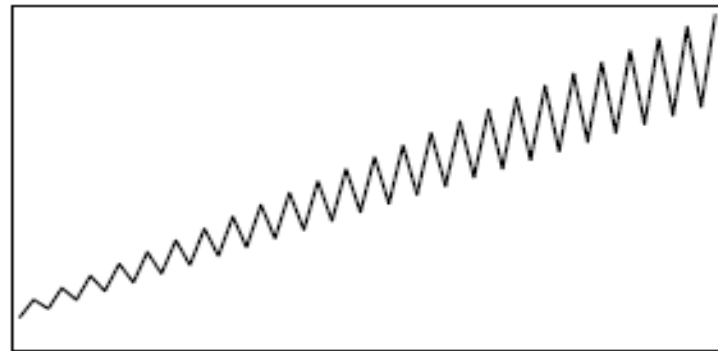
Seasonality



Additive Model



Multiplicative Model



Seasonal Adjustment (SA) of Turnover

- ➔ Turnover series show regular fluctuations in year, especially in December which is mass accounting month.
- ➔ Turnover series have been seasonally adjusted since 2014 in TurkStat.
- ➔ Indirect Approach (The Seasonally Adjusted data are computed indirectly by Seasonally Adjusting data per each series) is used.

Seasonal Adjustment Method

- ➔ TurkStat carries out the seasonal adjustment of industrial Turnover indices, using TRAMO-SEATS methodology based on ARIMA (Autoregressive Integrated Moving Average) model estimation developed by V. Gómez and A. Maravall (Bank of Spain) and also suggested by Eurostat.
- ➔ The software that is used for the application of this method is TRAMO-SEATS for Windows (TSW)

Model Specifications

- ➔ The process of seasonal adjustment of Industrial Turnover Indices begins at the end of each year with determination of the specification of models of the next year.
- ➔ The model, filters, outliers and calendar regressors are re-identified once a year (partial concurrent adjustment) by Data Analysis Techniques Group. This specified model structure is kept fixed throughout the year to adjust seasonally and/or calendar effects.
- ➔ At the end of the year, just like the previous year, specification of econometric estimation models for the following year is determined. The identified process repeats itself in a cyclical manner each year.

TurkStat Practice on Seasonal Adjustment

- ➔ National calendar variable which includes moving holiday (Ramadan and Eid al Adha), official holidays, Sunday numbers etc. is calculated by Data Analysis Techniques Group.
- ➔ ISG members have applied identified seasonal adjustment procedure within the year.
- ➔ 28 NACE Rev. 2 division, 2 letter, 5 MIGs and Total Industrial Turnover Indices are seasonally adjusted with domestic and non-domestic detail.

Industrial Turnover Index

Publication

- ➔ Adjusted data has been published in 3 different ways.
- ➔ **“Calendar adjusted”** data is derived from unadjusted data by removing calendar and holiday originated effects. Calendar adjusted data should be used in comparisons regarding the same month/period of the previous year.
- ➔ **“Seasonally adjusted”** data is derived from unadjusted data by removing effects originating from seasonal effects. Seasonally adjusted data should be used in comparisons regarding the previous month/period.
- ➔ If unadjusted data contains both calendar and holiday, and seasonal effects, **“seasonally and calendar adjusted”** data is derived by removing these effects. Seasonally and calendar adjusted data should be used in comparisons regarding the previous month/period.

Industrial Turnover Index

Revision Policy

- ➔ Seasonal adjustment procedure is subject to revisions over time because of the re-estimation of seasonal component as new observations are added. These revisions are implemented on the data of the last three years excluding the current year.