Specifications for Seasonal Adjustment

- The X-12-ARIMA procedure is used for seasonal adjustments to each item.
- Updating the seasonal adjustments takes place every year around April by using all available time series. Until the next update, the seasonally-adjusted figures are calculated using expected seasonal factors.
- The orders of the ARIMA model are determined by using the command: "automdl" in general. However, the model: (0 1 1) (0 1 1) is applied if at least one of automatically selected orders exceeds 2.
- Trading days, holidays, and leap-year effects are adjusted, and the user-defined variable is used for adjusting holidays. Outliers and temporary changes are automatically detected/adjusted in estimating regARIMA models using the command: "outlier" with default settings. These adjustments are all based on AIC.
- All series are seasonally adjusted using a logarithmic transformation with a multiplicative model. The forecast with the ARIMA model is extended up to 60 months, while backcasting is not conducted.
- Note that additional specifications are examined for some items if the source statistics, such as Indices of Tertiary Industry Activity etc., publish specifications for seasonal adjustments. Other than that, specifications adopted based on additional examinations are shown below.

	ARIMA model	Trading days and leap-year adjustment	Holidays adjustment	Outliers
Real automobiles	(1 1 0) (2 1 0)	Yes (td)	Yes	TC2009.Nov AO2010.Aug TC2010.Oct TC2011.Mar TC2011.Apr LS2012.Sep LS2014.Apr AO2014.Dec AO2015.Apr LS2019.Oct TC2020.Apr AO2020.May TC2021.Sep
Real household electrical appliances	(0 1 1) (0 1 1)	Yes (td1nolpyear)	No	AO2010.Nov TC2010.Dec LS2011.Aug AO2014.Mar TC2014.Mar AO2019.Sep TC2019.Sep TC2020.Jun