

ARIMA model setting and prior adjustment of outliers (2023 setting)

The table below shows the ARIMA model and prior adjustment of outliers for each grouping\*.

(1) Japan

Group	ARIMA model (p d q) (P D Q)	Outlier setting
All items	(1 1 0) (0 1 1)	LS2014.4 LS2021.4 LS2021.10
All items, less fresh food	(2 1 1) (0 1 2)	LS2014.4 LS2020.4 LS2021.4
All items, less fresh food and energy	(1 1 1) (0 1 1)	LS2014.4 LS2020.4 LS2021.1 LS2021.4 LS2021.10
Goods	(1 1 0) (0 1 1)	LS2014.4
Services	(0 1 1) (0 1 2)	LS2010.4 LS2014.4 LS2020.4 LS2020.8 LS2021.1 LS2021.4 LS2021.8 LS2021.10

(2) Ku-area of Tokyo

Group	ARIMA model (p d q) (P D Q)	Outlier setting
All items	(1 1 0) (0 1 1)	LS2014.4 LS2021.4
All items, less fresh food	(1 1 1) (2 1 2)	LS2014.4 LS2021.4
All items, less fresh food and energy	(2 1 2) (1 1 0)	LS2014.4 LS2020.8 LS2021.1 LS2021.4
Goods	(0 1 1) (0 1 1)	LS2014.4
Services	(1 1 0) (0 1 1)	LS2014.4 LS2020.4 LS2020.8 LS2021.1 LS2021.4 LS2021.8

(3) CPI calculated by Laspeyres' Chain Index method (Reference indices)

Group	ARIMA model (p d q) (P D Q)	Outlier setting
All items	(1 1 0) (0 1 1)	LS2014.4 LS2021.4
All items, less fresh food	(1 1 2) (0 1 2)	LS2014.4 LS2020.4 LS2021.4
All items, less fresh food and energy	(1 1 1) (0 1 1)	LS2010.4 LS2010.10 LS2014.4 LS2020.4 LS2020.8 LS2021.1 LS2021.4 LS2021.10

\* On the release of the December 2022 result for Japan, ARIMA model was reselected by following steps with the data from January 2010 to October 2022. For the ARIMA model, the model with minimum AIC (Akaike Information Criterion) was selected among the combinations of the difference order and seasonal difference order were fixed at 1, and other orders were within the range of 2 or less, after confirming the statistical significance of each order. Outliers that were considered most appropriate for each series were selected after verifying the statistical significance of the impact of changes in the index level due to the revision of the consumption tax rate and so on. The Reg-ARIMA model to be applied is reviewed by adding the latest data when the seasonally adjusted indices are revised every year.