

Chapter 6 Linking of old and new indices

1 Method of linking old and new indices

Old and new indices are linked to enable time series comparison for every index grouping.

The old base indices are linked to 2020-base indices as explained below.

(1) Linking of old and new indices

Old and new indices are linked in each category (area, group and item) by dividing indices whose base year indices are 100 by yearly average indices in the next base year. Therefore, for indices having their base year indices before 2020 as 100, this procedure must be repeated after every revision. In these cases, rounding is performed only at the final stage, where the 2020-base is 100, because rounding errors would accumulate if rounding were performed in every link.

In tabulation, link coefficients, which are calculated by multiplying all reciprocals of yearly average indices used for the link to 2020-base index, are calculated and linked by multiplying by old-based indices.

Example: The case when 2005-base indices are linked to 2020-base indices.

$$\begin{aligned}
 \text{2020-base linked index} &= \text{2005-base index} \times \frac{100}{\text{2010 average index (2005-base)}} \\
 &\quad \times \frac{100}{\text{2015 average index (2010-base)}} \\
 &\quad \times \frac{100}{\text{2020 average index (2015-base)}}
 \end{aligned}$$

Therefore, the link coefficient is obtained by multiplying all reciprocals of the yearly average index figures for the new base years in each old base as shown below.

$$\text{Link coefficient} = \frac{100}{\text{2010 average index (2005-base)}} \times \frac{100}{\text{2015 average index (2010-base)}} \times \frac{100}{\text{2020 average index (2015-base)}}$$

Using this link coefficient, the 2005-base index is linked to the 2020-base index as follows:

$$\text{2020-base linked index} = \text{2005-base index} \times \text{Link coefficient}$$

(2) Link to groups and items in 2020-base

The link principally applies to 2020-base groups and items. When 2020-base item (group) codes do not correspond to those of the 2015-base, the correspondence shown in the table below is used.

2020-base groups/items		2015-base groups/items	
0179	Railway fares (JR)	7026	Railway fares (JR)
0180	Railway fares (excluding JR)	7007	Railway fares (excluding JR)
0182	Highway tolls	7360	Highway tolls

(3) Link to areas in 2020-base

The link principally applies to 2020-base areas.

2 Range of linked indices

The range of linked indices is as follows:

(1) Basic classification indices

The following indices are calculated for Japan, the Ku-area of Tokyo, city groups, districts, cities with prefectural governments (excluding the Ku-area of Tokyo), and the government ordinance-designated cities (Kawasaki-shi, Sagamihara-shi, Hamamatsu-shi, Sakai-shi, and Kitakyushu-shi).³⁸

	Japan ³⁹ , Ku-area of Tokyo			City groups ⁴⁰ , districts, cities with prefectural governments ⁴¹ , government ordinance-designated cities ⁴²	
	Monthly	Quarterly	Yearly/F yearly	Monthly	Yearly/F yearly
All items, All items, less fresh food	Since January 1970	Since January - March 2000	Since 1970	Since January 1970	Since 1970
All items, less fresh food and energy	Since January 1970	Since January - March 2000	Since 1970	Since January 2015	Since 2015
All items, less food (less alcoholic beverages) and energy	Since January 1970	Since January - March 2000	Since 1970	Since January 2005	Since 2005
All items, less imputed rent	Since August 1946	Since January - March 2000	Since 1947	Since January 1970	Since 1970
10 major groups ⁴³	Since January 1970	Since January - March 2000	Since 1970	Since January 1970	Since 1970
Subgroups (including analytical series)	Since January 1970	/	Since 1970	Since January 1970	Since 1970
Minor groups	Since January 1970		Since 1970	/	
By item	Since January 1970		Since 1970		

³⁸ Okinawa District and Naha-shi have been included since 1975-base.

³⁹ The indices for Japan before 1962 represent those of all cities (corresponding to the classification of "cities with population of 50,000 or more").

⁴⁰ "Small cities B, towns and villages" has been calculated since 2010-base.

⁴¹ The Ku-area of Tokyo is excluded.

⁴² Hamamatsu-shi and Sakai-shi have been calculated since 2010-base. Sagamihara-shi has been calculated since 2015-base.

⁴³ 5 major groups were reclassified to 10 major groups when 1980-base index was calculated.

(2) Indices for goods and services groups

As for the indices of Japan and the Ku-area of Tokyo, yearly average, fiscal yearly average and monthly figure are calculated from 1970, and quarterly average from 2010.

However, “House rent, private (wooden)”, “House rent, private (non-wooden)”, “Imputed rent (wooden)”, and “Imputed rent (non-wooden)” have been calculated from 2010.

(3) Indices aggregated based on baskets of specific household groups

The following indices are calculated for Japan:

- a) Subgroup Index for Total Households
.....Yearly average from 2000, and monthly figure from 2010.
- b) Subgroup Index by Yearly Income Quintile Groups of Worker’s Households
.....Yearly average from 1990, and monthly figure from 2010.
- c) 10 Major Group Index by Age Groups of Household Head
.....Yearly average from 2010. However, the class of “Retired Elderly Households (age 65 and over)” has been calculated since 2015-base.⁴⁴
- d) 10 Major Group Index by Types of Tenure of Dwelling
.....Yearly average from 2010.

(4) Indices by the characteristic of items

The following indices are calculated for Japan:

- a) Indices of Goods Groups Classified According to Elasticity to Living Expenditure
.....Yearly average from 1980, monthly figure from 2010.
- b) Indices of Annual Purchase Frequency Classes
.....Yearly average from 1980, monthly figure from 2010.

(5) Indices calculated by Laspeyres’ Chain Index method (reference indices)

The indices for subgroup classification have been calculated for Japan since 1986-base. For details, refer to “III Appendix 5 Calculation of the CPI by Laspeyres’ Chain Index method”.

(6) Other indices⁴⁵

- a) Prewar base index

The yearly averages of prewar base indices⁴⁶ on five major groups (“All items”, “All items, less imputed rent”, “Food”, “Housing”, “Housing, less imputed rent”, “Fuel & light”, “Clothes”, and “Miscellaneous”) are calculated for the Ku-area of Tokyo from 2020-base.

To calculate the prewar base index, firstly, the 5 major group indices are calculated based on the current price index by item, whereupon the index is multiplied by the conversion rate for the prewar base.

⁴⁴ There is no linked index for the Households headed by persons aged 65 and over.

⁴⁵ There is no linked index for COICOP classification.

⁴⁶ The pre-war base index is based on the years from 1934 to 1936. The pre-war base indices in 2020-base year can be directly compared with the pre-war base indices calculated in base years up to 2015.

b) 2015-base conversion subgroup index

To facilitate the use of the data (e.g. relation to other 2015-base economic indices), 2015-base converted subgroup indices, which are calculated by multiplying 2020 average indices (2015-base) by 2020-base indices and dividing by 100, are to be calculated from January 2022 to June 2026.

The monthly, yearly average and fiscal yearly average indices are calculated for Japan and the Ku-area of Tokyo.

3 Notes on the use of linked indices

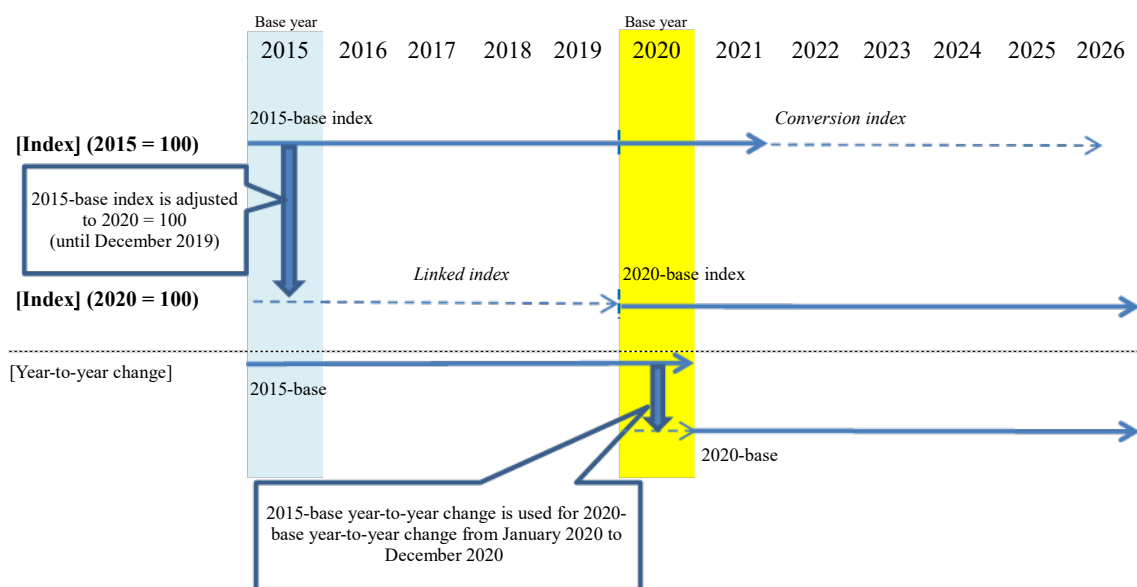
(1) Relation between upper level and lower level groups

Since indices are linked individually for areas, and for each grouping of all items, groups and items, the linked index for the upper level group may not correspond to that calculated from lower level groups, even in the same year or month.⁴⁷

(2) Treatment of the rate of change

The rates of change such as month-to-month, year-ago month and year-on-year ratios are published figures in each base year and not recalculated by linked indices. Of the rates of change in the base year, the change from the previous year, previous fiscal year, previous month of January and the same month of the previous year from January to December are figures calculated from indices in the old base. Therefore, the rate of change does not always match figures calculated by linked indices.

(Image)



⁴⁷ There may be missing items in the upper level group due to the absence of linked indices for the items removed during a base revision, or the indices of groups or items in the lower level group may not match their counterparts in the upper level even after being averaged with weights.