# Methodological choices when using multilateral methods: window length, seasonality and aggregation structure

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# Background

- Multilateral methods are increasingly being used to derive consumer price indices from transactions data.

- Eurostat released two publications in 2022:

  - [Guide on Multilateral Methods in the HICP (Guide)](#)

  - [Progress Report - Task Force Multilateral Methods 2022](#)

# Introduction

Choices have to be made when using multilateral methods. This presentation will address the following:

- the window length over which the multilateral method is compiled and the splicing method used;

- the compilation methodology for categories that include seasonal products;

- the aggregation structure and the methodology for integrating diverse data sources in the compilation.

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# TIME WINDOWS AND SPLICING METHODS

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# Window length

| shorter time windows | longer time windows |
|---|---|
| Trade offs | |
| ▪ could lead to unstable results<br>▪ may not solve the chain drift problem | ▪ data from the past will impact the current month compilations |
| Better for: | |
| ▪ products with short life-cycles (e.g. consumer electronics) | ▪ seasonal products to cover two successive in-season periods |

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# Adjusting the time window

| Rolling time windows | Expanding time windows |
| --- | --- |
| Each month, the time window is … | |
| …shifted forward by one month. | ...extended by one month. After one year, it could be reset to its initial length. |
| Advantages | |
| Window length is constant | Does not need long back data |

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# SPLICING METHODS

- Why do we need to splice?

Every month a new time window is used and indices are calculated for every period.

**To avoid revisions,** splicing techniques must be used which link the latest result onto the previous

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# SPLICING METHODS

- The different methods all have their advantages and disadvantages.

- The splicing method can be tested by comparing the resulting index to the index compiled over a full time window.

- The splicing methods can either use the recalculated or the published indices.
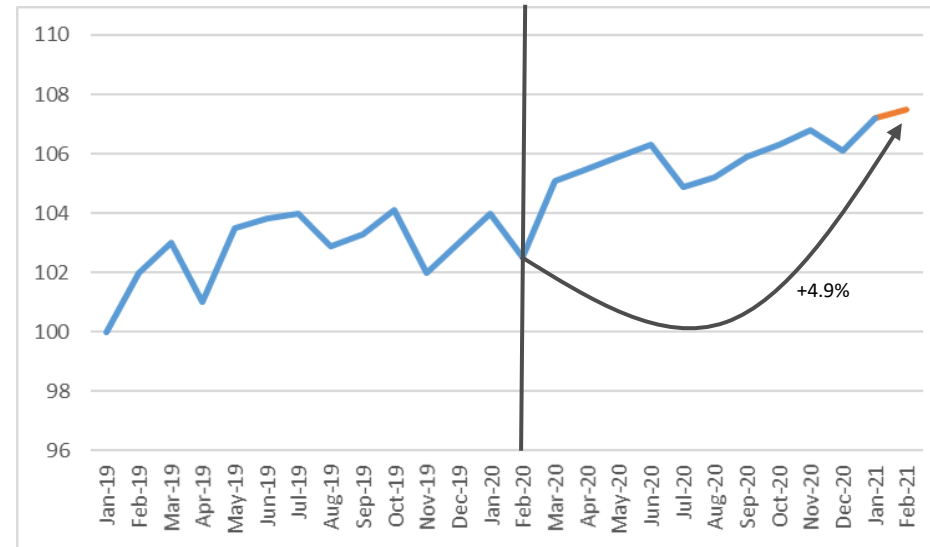
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# SPLICING METHODS

This example is obtained with the half splice on published series method using a 25 month rolling time window (25 HASP)

**yoy rates of published indices = yoy rates of the latest calculated multilateral index**
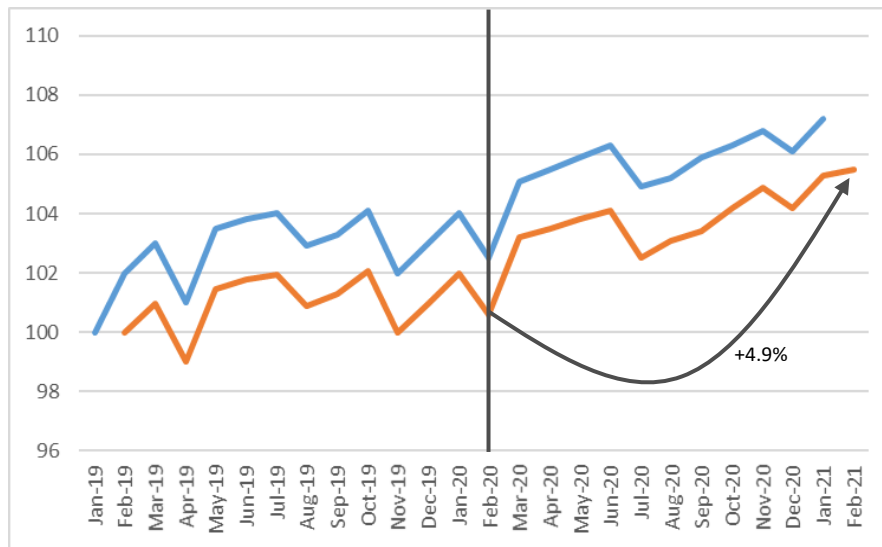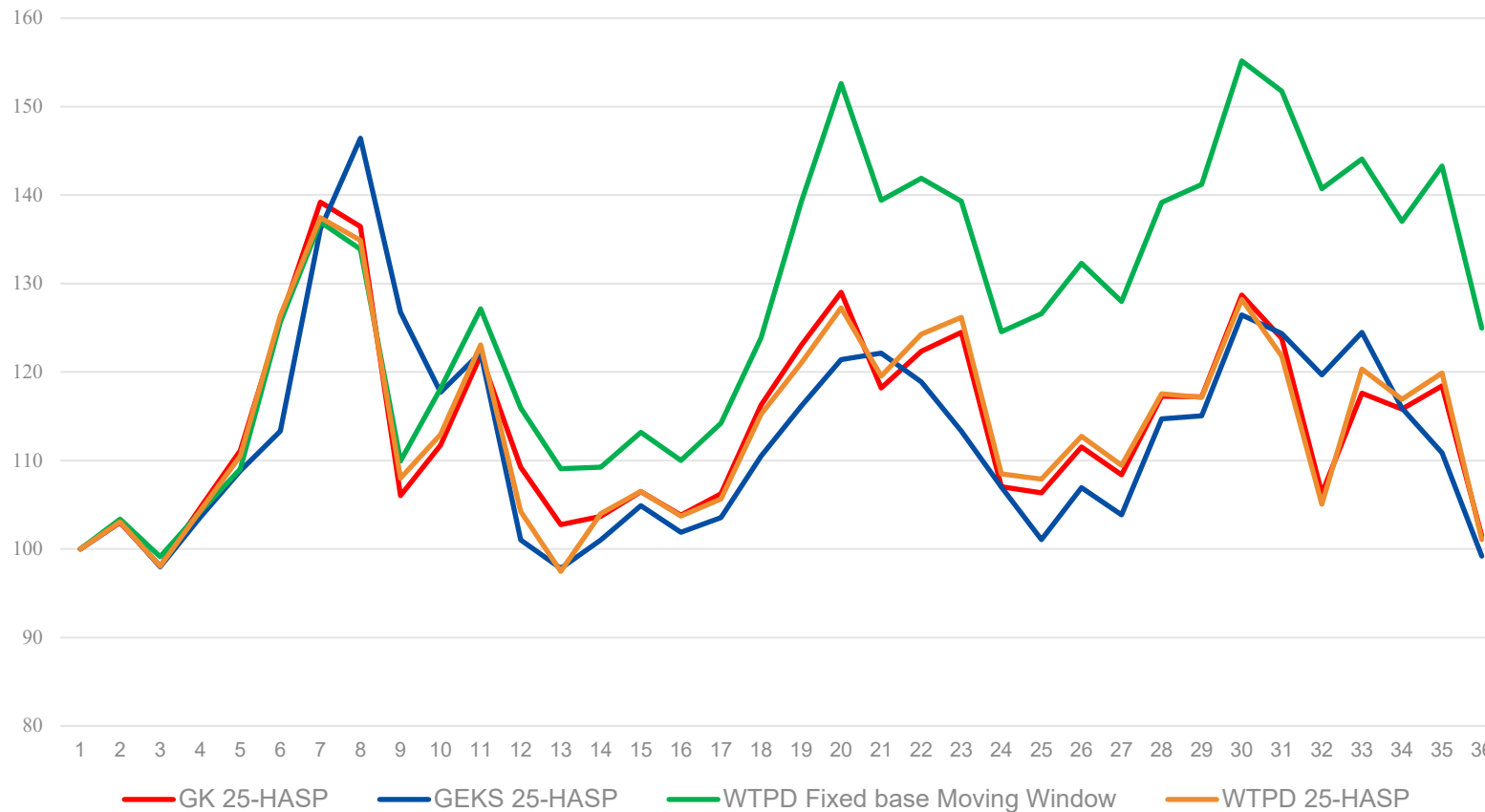


Index compiled over Jan19 to Jan21(blue) and over periods Feb19 to Feb 21 (orange).

Spliced (published) index from Jan19 to Feb21

SOURCE: EUROSTAT calculations

# SEASONAL PRODUCTS

# Seasonal products - Methods



A data set with seasonal products and the corresponding multilateral indices can be found in this file (Example provided by STATEC for the Guide).

# Seasonal products - Window length

- The window length should include the last month of the previous in-season period and the first month of the new in-season period.

- As in-season period vary, the window length should be at least 13 months.

- A 25-HASP splicing may be a good compromise because it ensures consistent annual rates and the window is sufficiently large to include all seasonal products.

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# Similarity linking method

- This method is based on an underlying bilateral price index that compares the current period to the most 'similar' previous period.

- The draft chapter 9 of the CPI Theory publication presents it as one of the preferred options in the context of seasonal products.

- Eurostat report provides some initial conclusions:

  - advantages - no need to select a window length or splicing method.

  - disadvantages - results depend on the choice of dissimilarity measure.

- The method shows pronounced differences in index behaviour compared to other methods.

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# AGGREGATION

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# How detailed is the elementary aggregate?

| Level | Option 1 | Option 2 | Option 3 | Option 4 |
|---|---|---|---|---|
| ECOICOP | Laspeyres-type | Laspeyres-type | Laspeyres-type | Laspeyres-type |
| Retail chain | Laspeyres-type | Laspeyres-type | Laspeyres-type (= EA) | Laspeyres-type (= EA) |
| Product category | Laspeyres-type | Laspeyres-type ( = EA) | | Törnqvist |
| Outlet | Laspeyres-type ( = EA) | | | |
| Individual product | Multilateral | Multilateral | Multilateral | Multilateral |
| Transacted product | Unit value | Unit value | Unit value | Unit value |

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# From the items to the elementary aggregates

- **Option 1**, the EA is defined rather tightly, i.e., the transactions of a detailed product category in a specific outlet.

- **Option 2**, is an intermediate solution which skips the outlet level.

- **Option 3**, the EA is defined rather broadly i.e., transactions of a given COICOP category in a given retail chain.

- **Option 4**, is a more advanced solution. The same structure as in option 3 but the price indices by product category are aggregated using variable weights with, for instance a Törnqvist index.

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# INTEGRATING DIVERSE DATA SOURCES

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# How can data from different sources be combined?

- A price index is compiled for each product and each data source.

- The indices for the different data sources are aggregated with weights.

- The weights must be fixed at this level because only fixed weights are available for the traditionally collected prices.

- The weights and the structure should be updated every year.

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# Integrating diverse data sources

Each of these cells are a sub-division

| | Scanner data (retailer A) | Scanner data (retailer B) | Web (retailer C) | Field price collection (other retailers) |
|---|---|---|---|---|
| **Region 1** | Multilateral method | Multilateral method | Method for web scraped data | Traditional price collection and index compilation |
| **Region 2** | Multilateral method | Multilateral method | | Traditional price collection and index compilation |

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# Conclusions

- The validity of a splicing method and a window length option should be empirically validated.

- Considerations should be given to the 'half splice on published indices' method over a 25-month rolling time window (25-HASP).

- To cover two successive in-season periods for seasonal products, the time windows must be longer than 13 months.

- Further research on multilateral methods for seasonal products is ongoing.

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# Conclusions

- Applying a multilateral method up to a:

  - more aggregated level is more appropriate for a dynamic universe of individual products.

  - lower aggregated level introduces more stability in the index.

- The index structure below the subclass level and the elementary aggregate weights should be reviewed and updated at least once per year.

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# Thank you

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