ADVISORY PANEL ON CONSUMER PRICES – STAKEHOLDER

Seasonal Adjustment of the Consumer Prices Index

Status: Draft
Expected publication: Alongside minutes.

Purpose

1. ONS acted on feedback from the Panel to commission the National Institute of Economic and Social Research (NIESR) to write a report to investigate options for producing seasonally adjusted (SA) CPI data alongside our existing CPI measures. This agenda item will be used as an opportunity to present the initial findings from NIESR and to seek feedback on the value of SA CPI and on issues including the revisions policy, aggregation issues and presentational issues relating to the CPI bulletin.

Actions

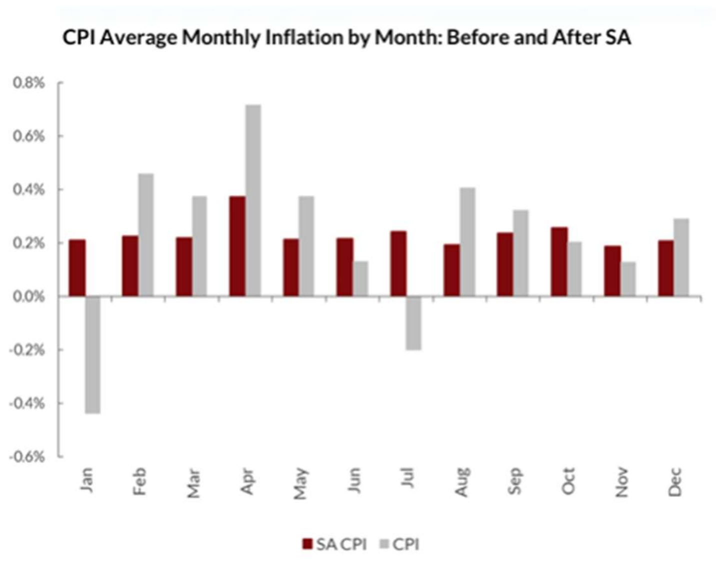
2. Members of the Panel are invited to:
   a) Provide feedback on the NIESR's initial findings
   b) Provide preference and feedback on areas for further focus. These include:
      a. A Direct or Indirect approach to seasonal adjustment
      b. Treatment of price series where seasonality is influenced by policy choice
      c. Breaking up each timeseries into 3 separate time periods before adjusting
      d. Revisions policy
      e. Publication and reporting strategy
   c) Provide feedback on our current next steps and suggest additions to our current plan

Summary of NIESR's report on the Seasonal Adjustment of CPI and CPIH

3. NIESR's central finding is that seasonal adjustment can be successfully applied to CPI/CPIH data using established statistical methodology. This adjustment seeks to strip out the impact of regular, repeating and predictable seasonal patterns in the price data so users can gain clearer insight into underlying inflationary pressures and economic trends.
4. Seasonal patterns are found to exist in UK monthly price data where effects such as January sales effects and budget-related price increases in April consistently influence inflation; the average CPI inflation rate in January is –0.4% and +0.7% in April between 1988 and 2024. Figure 1 demonstrates the impact that seasonally adjusting the CPI would have.
5. Seasonal adjustment would be applied to the individual price components in the hierarchical COICOP structure consisting of 84 to 87 4-digit series and over 60 aggregates (including the all-items CPI and CPIH measures) which make up Tables 37 and 38 in the Consumer price inflation tables. We would only seasonally adjust series that were found to have seasonal patterns using standard statistical tests. Between one fifth and one quarter of series were found to be "non-seasonal".
6. The proposed methodology would use the X-13 ARIMA-SEATS method which is an international standard for seasonal adjustment used by statistical agencies worldwide.

7. The seasonally adjusted data would particularly benefit monthly inflation analysis, where seasonal effects can mask or exaggerate underlying trends. While annual inflation rates are naturally less affected by seasonality, month-on-month comparisons would become significantly more meaningful for economic analysis, monetary policy assessment, and business planning.
8. This report has been published to the NIESR website and can be read here.

Figure 1: Comparison of average monthly inflation by standard and seasonally adjusted CPI between 1988 and 2024



Areas for further focus at ONS

9. **Direct vs Indirect estimation**
   In applying the adjustments across this hierarchical structure of COICOP which supply the headline CPI/CPIH there is a choice between direct or indirect estimation. Direct estimation seasonally adjusts each series individually, including each aggregate, while indirect estimation adjusts the smaller components before building up aggregates from these. Indirect estimation maintains the "adding up" feature that occurs in non-adjusted CPI/CPIH which is often a desirable property of these structures. On the other hand, direct estimation generally leads to the best possible seasonal adjustment of each price index, including the all-item figures.
   NIESRA show that direct estimation leads to series that add up "reasonably well" whilst splitting the timeseries into specific time periods can reduce the negative impact of the indirect approach. Figure 2 compares how the two approaches differ at the all-items CPIH aggregate, where adding up from the 4-digit series leads to a maximum difference of around 1.5%.
   There is no clear consensus on a preferred approach across other National Statistics Institutes (NSI's) and a final decision would be influenced by user demand. NIESR recommend that a direct approach is preferred initially due to its simplicity and to aid in initial user understanding, wherein an indirect approach can be carried out in a staged

manner going forward if this option is preferred by stakeholders.

10. **Policy Induced Items**
The recommendation is that initially ONS employs the direct estimation of all SA CPI and CPIH series, except for Division 4 which includes policy-induced variables. There is a somewhat subjective choice on which items are policy induced due to regulated prices or tax effects, partially policy induced or not policy induced.
The recommended approach is to not seasonally adjust these indices, but an objective definition is needed here to whether we classify policy impacts as seasonal patterns we wish to adjust for. For example, tobacco levies are applied seasonally but market forces may also show aspects of seasonality outside these periods.

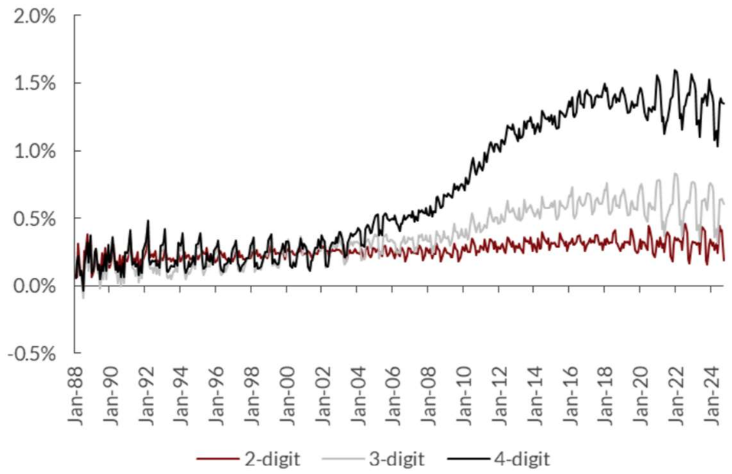
11. **Breaking up the CPI/CPIH series**
A recommendation is provided to break up the CPI/CPIH series and setting the values pre-2015 as given and updating the SA series from 2015 to present. The resulting series would then be chain linked to provide consistency over time. This was based on the presence of large outliers, the evolving nature of the SA process over longer timeframes and whether a single model is potentially too restrictive for the whole period. This would also limit the need for revising older data and reduce the later divergence between direct and the indirect approach to less than 0.5% (see Figure 2).
On the other hand, this would diverge from the standard approach taken across ONS for our other SA outputs and provides a level of complexity to the process and in communicating the method. The above issues can be accounted for (although in a slightly more complicated way) by using methods of outlier detection and level/seasonality splits in each series.

12. **Revision Policy**
The recommendation is to revise all the SA series each month. Revising series is a natural part of seasonally adjusted data as the estimated repeated seasonal pattern of the whole series can change as more data becomes available.
Standard practice at the ONS across other SA series is to revise annually which better balances user needs and resource constraints within ONS, whilst publishing the latest monthly figure using the current model. As standard CPI data has a “no revision” policy, communications are needed here to aid understanding of the revisions necessary in this supplementary data.

13. **Publication and reporting strategy**
The recommendation is to include the seasonally adjusted price indices in the Consumer price inflation tables matching the format of the unadjusted indices in Tables 37 and 38 for CPIH and CPI respectively. This would provide users with comprehensive and accessible access to the data. These tables would also need to accommodate revision triangles as the series are revised over time and detailed metadata for understanding.
The seasonally adjusted headline figures are recommended to become one of the main points in the monthly CPI bulletin with an extra section to compare to the non-adjusted series and to include less frequent updates when revisions are applied to the series.

Work is required to communicate the natural revision policy of seasonally adjusted data and to increase user understanding before including this commentary in the CPI bulletin.

Figure 2: Deviations of Indirect from Direct as a percentage: All items CPIH



Planned next steps

14. ONS have had a handover session with NIESR and are currently familiarising ourselves with the recommended method and framework to replicate their analysis. We can then tweak and test the models based on internal feedback and incorporating in feedback from stakeholders.
15. We are seeking feedback of the review from internal colleagues at ONS (particularly those within the Timeseries Analysis branch) where we will gather further information around best practises and of standardisation of approach across the organisation. This will also include advice on how best to produce this data through a monthly production cycle.
16. Alongside the stakeholder panel, we also would plan to start user engagement in Q3 of this year.
17. We plan to test the impact of index day within the seasonal adjustment modelling. The impact of Easter has already been tested within NIESR's model's however we believe it useful to also test how prices could be impacted by how the index day falls throughout a given month. This has previously been a stated reason behind price changes in airfare and hotel prices, and this can be adjusted for in seasonally adjusted prices.
18. A tentative date for the initial publishing of seasonally adjusted CPI is for March 2026.

Kevin Sharp
Prices Division, ONS
June, 2025