

# ADVISORY PANELS ON CONSUMER PRICES – TECHNICAL

## Minutes

19 January 2024

Teleconference

10:30 – 13:00

### Members in attendance

Mr Grant Fitzner (ONS) (Chair)  
Mr Mike Hardie (ONS)  
Mr Matt Corder (ONS)  
Dr Martin Weale  
Professor Paul Smith  
Professor Ian Crawford  
Mr Peter Levell  
Professor Bert Balk  
Mr Rupert de Vincent-Humphreys

### Secretariat

Ms Helen Sands (ONS)  
Mr James Wilkins (ONS)

### ONS Contributors

Mr Liam Greenhough (ONS)  
Mr Chris Bloomer (ONS)  
Mr Rob Bucknall (ONS)  
Mr Dawid Pienaar (ONS)

### Apologies

Professor Rebecca Killick  
Dr Jens Mehrhoff

## 1. Introduction and apologies

1.1. Mr Fitzner opened the meeting and passed on apologies from members unable to attend.

1.2. Mr Fitzner confirmed the position of any outstanding actions.

## 2. Inflation measurement with high frequency data

2.1. Mr Levell introduced a paper authored by himself, Mr Kevin Fox, and Mr Martin O'Connell at Institute for Fiscal Studies on inflation measurement with high frequency data. This provides an update on a previous paper presented on the use of multilateral indices for measuring Consumer Prices. Mr Levell informed the Panel that new sources of scanner data that contain a large number of transaction data on individual products allows for high frequency measurement of price change. This contrasts with traditional methods of price collection, where it would be more difficult to capture high frequency price changes compared to scanner data due to the amount of data needed. For instance, chocolate that may be available during Easter but is then unavailable after Easter.

- 2.2. Mr Levell informed the Panel that the paper systematically compares alternative index number methods for calculating month-to-month inflation with high frequency transaction data. The large dataset used for the analysis in the paper is different to the scanner dataset available to ONS. This systematic comparison is performed using many items, whereas current literature has typically focused on the comparison of specific items. The paper also assesses different: chaining methods, splicing techniques, and empirical causes of chain drift.
- 2.3. Mr Levell introduced the different index number approaches explored: fixed-base indices; chained index to account for changes in spending patterns and product churn; and multilateral indices. The problems associated with the different approaches were presented with supporting evidence from the paper. Fixed-base indices suffer from a basket which becomes unrepresentative over time, and a chained-index in the context of high frequency data leads to chain drift which is problematic. On multilateral indices, Mr Levell explained these are more stable and are not affected by chain drift as a matrix of all possible time series are used simultaneously, however this means previous periods may change when new data becomes available. To avoid this problem, linking indices across different windows through a link period can be used, however, this reintroduces chain drift. To reduce chain drift here, a decision on when to splice must be made. Mr Levell advocated for the use of a mean splice. Mr Levell presented different window lengths that can also be used to reduce chain drift, a 25-month length window was recommended, although this comes at the cost of delaying the introduction of new goods into the index because more data is required. Mr Levell presented regression analysis on the causes of chain drift, the paper determined when a 25-month window is used, only annual product churn was a statistically significant predictor of chain drift.
- 2.4. A Panel member stated that referring to producing traditional prices as having a small sample may be incorrect as there are still a large number of prices collected in traditional methods, and that the problem discussed is sample representativeness.
- 2.5. A Panel member asked if an assessment had been made on the impact of the cost of delaying the introduction of new goods into the price index because of using a 25-month window. Mr Levell replied that this had not been considered in the paper, but there are options to deal with this that involve expanding the window period as more data is available.
- 2.6. A Panel member asked for clarification on the previous work that stated CCDI as the preferred index to be used. Mr Levell stated that in a colleague's paper, a simulation was run given a set of preferences and price changes to calculate a correct cost of living index for individuals under different elasticities of substitution. The paper found the CCDI index was the closest

approximated index to the true cost of living index. The Panel member stated that this approach doesn't allow for product churn which the paper highlighted issues with. Therefore it may be advisable to run a new simulation based on the data available. Mr Levell highlighted the difficulty with this approach due to because reservation prices must be incorporated.

2.7. A Panel member highlighted the complex mathematics which underpin splicing approaches. They signposted a paper being drafted that explains the complications and may affect the interpretation of window periods used. Mr Levell asked the Panel member to circulate this paper once drafted.

2.8. A Panel member asked how a National Statistical Institute (NSI) may approach the first month, when they want to link the current price index with the new price index series utilising the methods presented. Mr Levell stated this isn't discussed in the paper but is valuable to consider.

### **3. Communicating the impact of GEKS-Törnqvist on Consumer Price Statistics**

3.1. Mr Greenhough introduced a presentation that aimed to discuss potential communication challenges as the GEKS-Törnqvist method becomes prevalent within consumer price statistics.

3.2. Mr Greenhough presented on how ONS may respond to questions regarding whether the GEKS-Törnqvist is too complex, and if so its suitability as a method. Mr Greenhough presented reasons and provisional responses why GEKS-Törnqvist methodology is not too complex, and that the mathematics used are interpretable. Reasons for this are: other elements of consumer price statistics have more complex methodology; internationally available coding packages enable statistic producers to get around the high number of computations, which is commonly the main source of complexity; there is increased international literature on the use of GEKS-Törnqvist in Consumer Price Statistics, including a publication from ONS; there are large benefits to adopting GEKS-Törnqvist methodology relative to traditional methods when using alternative data sources.

3.3. A Panel member asked what other NSIs that have introduced GEKS-Törnqvist methodology into Consumer prices have done on communicating the impact of the method. Mr Greenhough highlighted that this would be investigated. A Panel member recommended updating the GEKS-Törnqvist ONS publication to include the other NSIs that have introduced GEKS-Törnqvist methodology.

- 3.4. Mr Greenhough asked the panel for feedback on ONS's proposed response on whether our inflation measures should still be described as a "fixed basket" with the introduction of the GEKS-Törnqvist measuring price change from dynamic product samples. Mr Greenhough proposed that the "fixed basket" terminology remains a useful brief description of our inflation measures since public and media interest view of the basket generally focuses on the composition and changes within higher-level aggregates (items and consumption segments), which are still using a fixed basket framework, rather than product compositions underpinning elementary aggregates.
- 3.5. On explaining the basket with GEKS-Törnqvist methodology as fixed, a Panel member provided support that this is the correct approach. This is because the current basket still has products which drop in and out and non-comparable replacements introduced, and the GEKS-Törnqvist method is not substantially different enough from this to warrant a change in description.
- 3.6. Mr Greenhough presented provisional non-expert and expert user summary descriptions of GEKS-Törnqvist methodology. Mr Greenhough asked the Panel for feedback on these descriptions. The final potential issue discussed by Mr Greenhough was a proposed response on whether the GEKS-Törnqvist specifically measures expenditure change rather than pure price change. Mr Greenhough asked for feedback on the proposed answer to this potential question.
- 3.7. On the description of GEKS-Törnqvist for non-expert users, a Panel member highlighted in the discussion of weights to include that Consumer Price indices have always used weights, and now GEKS-Törnqvist utilises a detailed weighting structure. A Panel member emphasised the use of visual aids such as graphs as helpful way to explain the general concept of GEKS-Törnqvist.
- 3.8. For the expert user description, a Panel member questioned whether the explanation of the extension methods used in GEKS-Törnqvist had been considered. Another Panel member supported the inclusion of an explanation on extension methods, with a spreadsheet example to practically demonstrate the GEKS-Törnqvist method. In response, Mr Greenhough highlighted an ONS publication which includes greater detail on this, and asked in the context of a brief presentation whether this should be a focus. Another Panel member emphasised the usefulness of this ONS publication, and to signpost this publication.

#### **4. Using HMRC Unit Value Indices for measuring inflation in homogenous trade commodities**

- 4.1. Mr Bloomer introduced the HMRC Unit Value Price Indices paper circulated with the Panel. Mr Bloomer presented the background of the paper, which is to use a HMRC admin data source to create unit value prices and aggregate to create indices. This is to improve current import and export price indices, which uses survey data and suffers from a number of problems as a result.
- 4.2. Mr Bloomer presented method proposed to calculate the Unit Value Price Indices using the newly available HMRC dataset. The quality assurance and index aggregation methods used to produce the indices were also explained. The indices calculated with different index aggregation methods which include GEKS-Törnqvist, and time product dummy multilateral with annual and monthly weights were presented. These calculated indices were compared against other import and export price indices for a range of given commodities. Mr Bloomer asked the panel for feedback on:
  - 4.2.1 Methods for HMRC Trade Unit Value quality assurance.
  - 4.2.2 Methods for HMRC Trade Unit Value imputations.
  - 4.2.3 Methods for HMRC Trade Unit Value aggregation.
- 4.3. A Panel member stated that the difficulty of using a multilateral index approach is the extension methods, as the index depends on many windows which adds to the complexity of the method. Mr Bloomer explained that similar results were produced regardless of the use of windows.
- 4.4. A Panel member highlighted that a twenty percent movement threshold was applied for trimming. The Panel member put forward the use of winsorization, which means a movement of twenty percent is applied rather than removing the observation. Mr Bloomer clarified in this instance an imputation is applied based on movement of other similar products. In response another Panel member highlighted that deleting and imputing values which fall outside this threshold may affect the price change in the index, where this impact is unknown from the paper. The Panel member also emphasised using a plus or minus twenty percent threshold may mean more ratios are trimmed from the top than the bottom, the Panel member supported using a trimming process symmetric in the ratios (e.g.,  $3/2$  and  $2/3$ ) to decrease the amount being trimmed at the bottom.
- 4.5. A Panel member questioned whether certain commodities in the Unit Value Index are too heterogenous to use a unit value approach. Mr Bloomer clarified the level at which the Unit Value Index is calculated.
- 4.6. A Panel member highlighted the usefulness in seeing a comparison of calculated series at the unit value level to understand the difference in the HMRC data from current price collection data. This would ensure that current and new data sources are measuring the same object. Mr Bloomer

highlighted the difficulties in doing so due to the small sample size of current data sources.

4.7. A Panel member highlighted that using a higher-level index as an imputation for a lower-level index in their experience caused odd results. The Panel member requested detail that this process used is not leading to odd movements in the series.

## 5. Publication status of papers

5.1. The paper presented by Mr Levell is already published on Institute for Fiscal Studies.

5.2. The paper on using HMRC Unit Value Indices will be published at a later date.

## 6. AOB and date of next meeting

6.1. The next meeting will be held on Friday 12 April 2024.

6.2. Mr Corder gauged Panel members interest in contributing towards a joint paper with members of the Stakeholder panel on the different price index formula methods. Multiple Panel members expressed willingness to be involved.

<b>No.</b>	<b>Action</b>	<b>Person Responsible</b>
1	ONS to determine how other National Statistical Institutes (NSIs) have communicated introducing GEKS-Törnqvist (or similar methods) into their prices statistics and whether lessons can be learnt from these approaches.	Mr Dawid Pienaar