

Advisory Panels for Consumer Prices

2019 Annual Report to the National Statistician

March 2020

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1. Introduction

This is the fourth annual report from the Advisory Panels for Consumer Prices (APCP) to the National Statistician. The APCP Technical has met four times in 2019 (once by teleconference), and the APCP Stakeholder has met separately three times in 2019, to discuss issues important to the ongoing progress of consumer price statistics in the UK. This report contains a summary of discussions held by the Panels in 2019, and the resulting outcomes. These discussions address the development of indices to meet user needs, the forward work programme for consumer price statistics, and other methodological changes to consumer price statistics in the UK.

2. Recommendations

The APCPs recommend to the National Statistician that:

- The National Statistician notes the progress the Office for National Statistics (ONS) has made against the work programme for consumer price statistics and endorses the forward work programme that focuses on: the use of alternative data sources, research into developing the Household Costs Indices (HCIs), and producing a longer historical series for Consumer Price Index including owner occupier's housing costs (CPIH).
- He notes the progress on moving towards the use of alternative data sources in consumer price statistics; work on this should continue as a high priority. The panels agreed the proposed alternative data sources roadmap and project plans to introduce alternative data sources as a high priority for 2023, including further exploration of technical aspects such as extension methods for new multilateral indices and consideration of criteria for selecting index methods.
- He notes the successful discussion at the Economic Statistics Centre of Excellence (ESCoE) workshop on the HCIs conceptual foundations and publication of the second set of experimental estimates. The HCIs should continue to be developed as experimental statistics, with National Statistics status to be sought following a move to quarterly production in 2022. He should also note the Stakeholder Panel recommendation to develop 'maximalist' HCIs to include all proposals, with a range of subgroup measures that would exclude certain items deemed to be inappropriate for some uses, such as housing capital.
- ONS should continue work improving the methods for package holiday items as part of the alternative data sources programme, to be delivered from 2023
- ONS should model and publish CPIH historical estimates back to 1947 as a priority.
- Shop-type weights should be updated using Annual Business Survey (ABS) data matched to store counts from the Inter-Departmental Business Register (IDBR) with the annual updates in February 2020's index, subject to the remaining issues around volatility being resolved.
- Any inclusion of multi-buy discounts in consumer price indices should be introduced along with the new alternative data sources from 2023, to minimise the discontinuity caused to the series

Specifically, the APCP-S recommends to the National Statistician that:

- With regard to the Retail Prices Index (RPI), more than routine maintenance was needed, and that ONS should address the impact of changes in clothing price collection made in 2010 as a matter of urgency.

The APCP-T recommends to the National Statistician that:

- In the RPI consultation, beginning on 11 March 2020, ONS should put forward its preferred technical approach to bringing the methods and data sources of CPIH into RPI, rather than presenting options.

3. Background

The establishment of the Technical and Stakeholder APCP was recommended by an [independent review](#) of the governance of price statistics in February 2014, which considered matters relating to the governance arrangements and structures underpinning the production of consumer price indices by the ONS.

The APCP have met regularly throughout 2019. The Technical Panel typically meets 1-2 weeks prior to the Stakeholder Panel and the Chair of the Technical Panel then provides an update to the Stakeholder Panel on the discussions that have taken place. The APCP-T and APCP-S do not necessarily discuss the same papers, but there will inevitably be some overlap in the topics discussed.

The Technical Panel¹ functions to provide independent advice to the National Statistician on technical aspects of consumer price indices, as requested by ONS and/or the Stakeholder Panel. The Stakeholder Panel² functions to provide independent advice to the National Statistician on the uses and applications of consumer price indices, to ensure that these statistics meet the needs of users and ‘serve the public good’.

On 8 January 2015, the UK Statistics Authority (UKSA) published an independent [review of UK consumer price statistics](#) led by Paul Johnson, Director of the Institute for Fiscal Studies. A number of recommendations were made, and the Authority launched a formal [public consultation](#) in the summer of 2015. In addition, on 11 March 2016, the government published an independent review of economic statistics, led by Professor Charles Bean of the London School of Economics. Prof. Bean supported Johnson’s recommendations, but placed greater emphasis on alternative data sources.

On 17 January 2019 The House of Lords Economic Affairs Committee published a report, [Measuring Inflation](#), which made a number of recommendations, in particular in relation to the RPI. On 4 September 2019 the [UKSA](#) and the [government](#) responded to the Lords report. The UKSA proposed that the publication of RPI be stopped at some point in the future, and in the interim, the shortcomings of RPI should be addressed by bringing the methods and data sources of CPIH into it. The then Chancellor announced that he was not minded to promote legislation that would remove the requirement for the UKSA to produce and publish the RPI, but did signal his intention to consult on when between 2025 and 2030 to bring the methods and data sources of CPIH into RPI. The UKSA would consult on the methods of making this change.

Many of the topics discussed by the APCP in 2019 follow from recommendations in the Johnson and Bean reviews and questions raised during the 2015 public consultation. Further topics included the Household Costs Indices, the future of RPI, as well as contingency planning for a no-deal Brexit.

¹ Technical Advisory Panel for Consumer Prices [Terms of Reference](#)

² Stakeholder Advisory Panel for Consumer Prices [Terms of Reference](#)

4. Topics discussed in 2019

The APCP Technical met four times (once by teleconference) and the APCP Stakeholder met three times during 2019. A number of topics were discussed, including:

- RPI collection and formula issues, including the Lords Economic Affairs Committee inquiry into RPI, the UKSA response to the inquiry and related issues with the measurement of inflation with respect to clothing and footwear
- Developments associated with the use of alternative data sources in consumer price statistics, including:
 - A roadmap for the development of a statistical pipeline
 - Expenditure weights for web scraped data
 - Index methods for use on web scraped and scanner data
 - Classification in price statistics production pipelines
 - Prioritising suitable categories for the inclusion of alternative data sources
- Continuing development of the Household Cost Indices and the associated Economic Statistics Centre of Excellence (ESCoE) workshop
- Index methods and data collection for package holidays
- Price collection in the event of a no-deal Brexit
- The forward work programme for consumer price statistics

The Technical Panel also discussed methodological topics, including:

- Improving regional CPIH estimates through the use of small area estimation for expenditure weights
- A review of the use of quality adjustment methods in consumer price statistics
- The inclusion of multibuy offers in consumer price statistics
- A new data source for shop-type weights

4.1 RPI and The Lords Economic Affairs Committee report “Measuring Inflation”

The outcome of the enquiry into the RPI by the House of Lords Economic Affairs Committee was discussed in January 2019, first by the Technical Panel, who considered some of the arguments around the use of unweighted index number methods, and concluded that “their properties also need to be considered in the context of price collection in practice. The evidence based on the clothing shows that the Carli formula is less suitable than the Jevons and Dutot formulae”. The Stakeholder Panel discussed the report’s findings in January and [wrote to the then National Statistician](#). More detail on the Advisory Panel discussions is provided in the [minutes](#).

The Stakeholder Panel later discussed the UK Statistics Authority Board’s subsequent [recommendation](#) to address the shortcomings in RPI such that its methods and data sources are based on the National Statistic, CPIH. This discussion is summarised in the September 2019 APCP-S [minutes](#). While there was agreement on some aspects of the UKSA proposal, there was more disagreement. The January 2019 letter to the National Statistician summarises many of the relevant issues discussed by the Stakeholder Panel throughout the year. In November 2019 the Technical Panel provided advice on the UK Statistics Authority sections of the working draft of the consultation on the future of RPI, which is being run jointly with HM Treasury. This advice is also summarised in the relevant [minutes](#).

4.2 Development around use of alternative data sources in consumer price statistics

The Stakeholder Panel discussed the merits of scanner and web-scraped data, noting that web-scraped data was useful when detailed attribute information is required or when it is impractical to collect scanner data. Scanner data contains less detail but includes expenditure weights, whereas web-scraped data do not contain expenditure weights, although page rankings may be a reasonable proxy for these. Machine learning techniques are being researched to assist in identifying replacement products in price collection for items such as clothing. The panel also requested at least two years of sensitivity analysis be done before new data sources are incorporated into headline measures, and noted the potential need for contracts with suppliers of alternative data.

Expenditure weights for web-scraped data

The Technical Panel discussed the use of approximate expenditure weights for web-scraped data. There was discussion around the probability distribution that should be used to describe the quantity shares when items are ranked from highest sales to lowest. They concluded that there is potential to use page rankings, but the proposed methods would require a degree of involvement from retailers.

Index methods for use on web-scraped and scanner data

The Stakeholder Panel heard ONS's framework for selecting index number methods for alternative data including scanner data and web-scraped data. The panel agreed that a range of different methods could be used and should be chosen to best suit the item, but that ease of understanding among users should be considered.

The Technical Panel discussed the criteria for selecting index methods as well as the merits and de-merits of the suggested methods. The trade-offs between transitivity and other factors were discussed. In particular, it was noted that transitivity is only given by a limited number of formulas and requires being able to make revisions, which is not compatible with current policy around consumer price indices. A deeper analysis into extension methods, which could manage this trade off, was proposed. It was also proposed that the criteria for selecting index methods could be weighted according to their importance.

Classification in price statistics production pipelines

The Technical Panel discussed proposed guidelines for how to measure classifier performance in price statistics production pipelines. The panel raised relevant work by Eurostat and Statistics Netherlands, as well as various technical questions and suggestions around the accuracy, error, parameters, training and maintenance of classifiers

Prioritising suitable categories for the inclusion of alternative data sources

The Stakeholder Panel discussed [ONS's proposals](#) for priority items included in the alternative data sources work, agreeing to the list of items including chart collected goods, technology items and grocery items.

4.3 Development of the Household Cost Indices and the ESCOE workshop

An [ESCoE workshop](#) was held on 25 April 2019 on the conceptual foundations of the HCIs - a set of measures designed to reflect changing prices and costs as experienced by households - gathering input from a range of users and academics, and including representatives from both the Stakeholder and Technical panels. The Technical and Stakeholder panels also discussed the minutes from the workshop.

The Stakeholder Panel considered the HCIs to be a valuable and informative measure, improving understanding of inflationary effects on different groups. They looked forward to their future development as experimental statistics, with a view to seeking a National Statistic assessment once the framework was agreed. They agreed that the HCIs should be based on a democratic weighting scheme covering UK resident households, and should be produced quarterly. The panel also discussed various items to be included or excluded and variants which included additional items for alternative uses. There was support for the development of a 'maximalist' index which includes all proposals, and a range of sub-indices, which would exclude items such as capital payments for housing and pension contributions, as appropriate. There was disagreement over the inclusion of mortgage capital and other housing capital payments, as well as the inclusion of auto-enrollment pension contributions.

The Technical Panel discussed potential user needs for the HCIs, with some suggesting that they could be used to provide a measure of how well-off households are and should relate to levels of disposable income. Panel members emphasised the need for both economists and other users to have input into their development. The panel noted that there was a lack of consensus on many issues.

The panel communicated their views on the HCIs as a measure to the National Statistician and recommended continued engagement with stakeholders to understand uses. The then National Statistician, John Pullinger, published a statement on the future direction of the Household Cost Indices ([link](#)).

4.4 Assessment of small area estimation for regional Consumer Price Index (CPI) expenditure weights

The Technical Panel were invited to comment on work by the University of Southampton, extending their research on regional price indices by looking at the use of small area estimation to create more robust regional expenditure weights. The panel suggested some alternative models that could be considered for this work. A key finding was that the ONS would need to collect more price data at the regional level to be able to produce robust sub-national price indices. Access to scanner data in the future could help to supplement areas where data is lacking.

4.5 Quality adjustment review

The Technical Panel was invited to comment on the ongoing review of quality adjustment methods in consumer price statistics. The panel suggested possible means by which items could be prioritised for further investigation, using a combination of Implicit Quality Index

(IQI) scores and other factors, such as the item's weight. The panel cautioned that while IQIs can be used to monitor quality adjustment, they do not necessarily imply a literal quality change, and also that care should be taken not to over-interpret IQIs for seasonal items. Going forward, ONS envisages developing a system which flags areas requiring further investigation; these would then be reviewed on a case-by-case basis.

4.6 Discounted Prices

The Technical Panel was invited to comment on the results of a pilot study looking at approaches to implementing multi-buy discount offers in consumer price statistics. The panel considered it best to introduce any inclusion of multi-buy discounts along with the introduction of alternative data sources from 2023, to minimise the discontinuity caused to the series and so that scanner data can be used to provide definitive volumes of offers taken up. The point was raised that volumes of goods purchased may vary greatly in response to discounting, and that the impact of this on inflation was not captured with the current fixed basket methodology, but would be captured in unit value indices produced using scanner data. Some possible limitations of scanner data for analysing discounts and potential implications for index quality were also put forward. ONS will continue research on multi-buy discounts as part of the wider alternative data sources project.

4.7 Updating the data source for shop type weights

The Technical Panel was invited to comment on analysis looking at the implications of updating the shop type weights used in consumer price indices using data from the Annual Business Survey (ABS). The panel suggested possible reasons for some anomalies in the shop type splits calculated with Annual Business Survey (ABS) data, and suggested ways to treat volatile weight movements and improve the match rate between ABS and Inter-Departmental Business Register (IDBR) data. The panel agreed that the shop-type weights should be updated using ABS data from the annual updates in February 2020's index, subject to the remaining issues around volatility being resolved. ONS has requested that the Annual Survey of Goods and Services (ASGS) work towards asking businesses to break down their turnover generated online and in physical stores. Once sufficient ASGS data has been collected, this would be used to update the shop type weights.

4.8 The forward work programme for consumer price statistics

In May 2019 the Stakeholder Panel discussed the forward work programme and the priorities for consumer prices.

The panel acknowledged that the adoption of scanner and web-scraped data was growing but urged that their conceptual use be demonstrated on small projects, before implementation, and that an understanding of the constraints be gained. Stakeholder Panel members felt that discounts was an area that could be higher priority, however, after current analysis was subsequently shared with the Technical Panel, they recommended that multibuy discounts should not be implemented until a scanner-type data source becomes available.

Panel members confirmed that development of the CPIH back series for 1947-87 should be a priority, but there may be a need to similarly re-model CPI estimates due to revisions in the modelled 1988-96 CPI series.

More information on the programme can be found in Section 5 and the full programme, updated to include recommendations from both panels, is provided in Annex A.

4.9 Redacted material

The panels discussed two topics that were redacted; please see the published minutes for more information.

5. Strategy and forward work programme for consumer price statistics

ONS has a programme of research and development that is aimed at improving and maintaining the range of consumer price indices - ensuring that they continue to meet user needs, and make use of new and innovative methods. Since the previous iteration of the work programme, a considerable amount of progress has been made. This includes:

- Publication of a longer [historical series for CPIH](#) in December 2018, covering the period from 1988 to 2004
- Publication of the [second preliminary estimates of the Household Costs Indices](#) in April 2019, including the introduction of a student loan repayments component
- [Second annual publication of CPIH-consistent subgroups](#) in May 2018, and ongoing publication of quarterly data tables on the same basis
- Publication of further work by the University of Southampton assessing the use of [small area estimation for regional expenditure weights](#), as part of their work exploring the feasibility of producing a regional CPIH
- The RPI reconciliation was updated to be on a CPIH basis with the October 2018 consumer prices bulletin

ONS expects its top priorities for the next few years will be to continue to develop the range of consumer price measures to meet the three user needs identified by the National Statistician – a set of measures consistent with recognised economic principles, measuring the household experience of changing prices and costs, and consulting on the future of the Retail Prices Index. ONS' priorities therefore are to:

- Embed CPIH as the lead inflation measure in the UK by providing users with a longer time series and more granular data, continuing to provide information and assurances on sources used to compile CPIH, and improving user understanding of the measure
- Continue to produce and improve the CPI so that there is a measure that is comparable internationally
- Work to develop a set of indices that reflect inflation as experienced by household groups
- Consult on the future of the RPI
- Improve all of its consumer price statistics through the use of alternative sources of price and transaction data

ONS have committed to review and update this work programme annually and to provide an update to the Authority Board via the National Statistician. In updating the work programme, ONS will seek the guidance of the Advisory Panels on Consumer Prices and engage with users and experts of these statistics.

Annex A presents the work programme proposed by APCP for January 2020 onwards, taking into account changed priorities since the previous iteration of the work programme.

6. Membership of the Technical Advisory Panel for Consumer Prices³

³ Members of the Technical Advisory Panel for Consumer Prices have been appointed for their expertise rather than their institution.

Members

Mr Grant Fitzner	Chief Economist and Director of Economic Statistics, Office for National Statistics (Chair)
Mr John Astin	Independent expert – nominated by RSS
Prof. Bert Balk	Erasmus University, Netherlands
Mr Robert Bucknall*	Methodology, Office for National Statistics
Dr Antonio Chessa	Statistics Netherlands
Dr Gareth Clews**	Methodology, Office for National Statistics
Prof. Ian Crawford	University of Oxford
Mr Rupert de Vincent-Humphreys	European Central Bank
Mr Mike Hardie	Prices Division, Office for National Statistics
Mr Peter Levell	Institute for Fiscal Studies
Dr Jens Mehrhoff	Deutsche Bundesbank
Prof Paul Smith	University of Southampton
Dr Martin Weale	King's College London

Secretariat

Miss Joanna Corless Office for National Statistics

Mr Christopher Payne Office for National Statistics

* Members that have stepped down from the panel during the year

** New members of the panel that joined throughout the year

7. Membership of the Stakeholder Advisory Panel for Consumer Prices

Members

Dame Kate Barker	Chair
Mr Jonathan Athow	Deputy National Statistician, Office for National Statistics
Mr Grant Fitzner**	Chief Economist and Director of Economic Statistics Office for National Statistics
Mr Richard Barwell*	BNP Paribas
Mr Simon Hayes	Bank of England
Mr Michael Hardie	Prices Division, Office for National Statistics
Ms Jill Leyland	Royal Statistical Society
Mr Daniel Gallagher	HM treasury
Mr Ian Rowson	Independent Policy Analyst
Mr Andrew Sentance*	PricewaterhouseCoopers
Dr Geoff Tily	Trades Union Congress
Mr Matthew Whittaker	Resolution Foundation
Mr Jonathan Camfield**	Lane Clark & Peacock
Mr Richard Gibson**	Barnett Waddingham
Mr Ashwin Kumar**	Manchester Metropolitan University

New members appointed for 2020

Ms Jenny King

Secretariat

Mr Andy King Office for National Statistics

Dame Kate Barker would like to thank Mr Andrew Sentance, and Mr Richard Barwell for their contribution to the Stakeholder panel. She would also like to welcome Mr Simon Kirby, Mr Jonathan Camfield, Mr Richard Gibson, Mr Ashwin Kumar, and Ms Jenny King to the Panel, and to convey that extending the membership of the Panel has enriched the debates in 2019.

* Members that have stepped down from the panel during the year

** New members of the panel that joined throughout the year

8. Papers presented to the Technical Advisory Panel for Consumer Prices in 2019

Date	Title	Summary
Jan 2019	The use of unweighted indices in ONS's consumer price statistics APCP-T(19)01	This paper provides references to recent discussion around the use of unweighted formula in ONS's consumer price statistics, following the Lords Economic Affairs Committee's inquiry into the use of RPI.
Jan 2019	Assessment of small area estimation for regional CPI expenditure weights APCP-T(19)02*	This paper sets out further work carried out by the University of Southampton exploring the feasibility of producing regional breakdowns of CPIH. The aim of this report is to explore the potential suitability and benefits of using small area estimation for regional expenditure weights in a regional CPIH.
Jan 2019	The use of approximate expenditure weights for web scraped data APCP-T(19)03	Expenditure and quantity information are not available at the product level in web scraped datasets. This paper is an update to research presented in APCP-T(18)14 in September 2018, and continues to investigate approximate weight allocation methods for the individual product quotes used in the calculation of an item's index.
Jan 2019	Review of quality adjustment methods currently used in ONS consumer price indices APCP-T(19)04	This paper provides an update on the review of quality adjustment procedures in consumer price statistics. We propose a number of indicators for monitoring the effectiveness of quality adjustment methods in practice.
May 2019	Draft Work Programme (by correspondence) APCP-T(19)06*	This paper discusses the future work programme and priorities for the development of consumer price statistics. The final version of the Forward Work Programme for Consumer Price Statistics can be found in Annex A of this document.
May 2019	The conceptual foundations of Household Cost Indices (ESCOE workshop) APCP-T(19)07 Annex A	This paper presents a summary of the discussion from the recent ESCOE workshop discussing the conceptual foundations of the HCIs.
May 2019	Alternative methods and data sources for package holidays APCP-T(19)08*	This paper explores alternative approaches to measuring package holiday price changes in line with legislation for the Harmonised Index of Consumer Prices (HICP), utilising two data sources – a manual internet collection, and using web scraped data

May 2019	Shortlisting appropriate index methods for use on web scraped and scanner data APCP-T(19)09	This paper forms ideas about the appropriateness of methods that can be applied to web scraped or scanner data sets for use in price index compilation.
May 2019	Guidelines for selecting metrics to evaluate classification in price statistics production pipelines APCP-T(19)10	This paper takes a theoretical approach to set out initial guidelines for how we should measure classifier performance in price statistics production pipelines to minimise error on the price index.
September 2019	Alternative methods and data sources for package holidays – update APCP-T(19)12*	This is an update on package holidays work presented at May's APCP-T in APCP-T(19)08. The note details some further research, and also responds to APCP-T feedback from May
September 2019	Planning for continued price collection in the event of a no-deal Brexit APCP-T(19)13*	This paper describes ONS's contingency plan for maintaining a price collection in the event of reduced stock availability in the event of the UK leaving the European Union on 31st October without a deal.
September 2019	Updating the data source for shop-type weights APCP-T(19)14*	This is an update from the previous paper APCP-T(18)11 Updating the data source for shop-type weights. It analyses the Annual Business Survey matched to IDBR data as a potential source for shop-type weights.
September 2019	Collecting Discounted Prices APCP-T(19)15	The impact of including multi-buy discount offers in consumer price statistics and possible approaches to implementing this are being investigated in a pilot study. This paper presents the results of the study.
September 2019	Discussion on unweighted index number formulae APCP-T(19)16*	This paper is a draft of an article intended to summarise the strengths and weaknesses of different commonly used unweighted index number formulae.
November 2019	Proposed text for the consultation on the future of the Retail Prices Index APCP-T(19)18*	This paper and its accompanying annex sets out the intended technical content for the forthcoming consultation which proposes to reform RPI by bringing in the methods and data sources of CPIH. This paper is a partial draft of the consultation which has now been published on Citizen Space .

*This paper has not been published at this time, for more information please refer to the [published minutes](#)

Note: excludes Terms of Reference, verbal updates, minutes, agendas and letters

9. Papers presented to the Stakeholder Advisory Panel for Consumer Prices in 2019

Date	Title	Summary
Jan 2019	Lords Economic Affairs Committee Measuring Inflation APCP-S(19)03	This paper presents the findings of the House of Lords Economic Affairs Committee enquiry into measuring inflation, with a focus on the RPI.
Jan 2019	Alternative Data Sources Roadmap APCP-S(19)04	This paper provides an overarching view of the work on establishing a proposed pipeline for processing alternative data sources
May 2019	Draft Work Programme <i>APCP-S(19)06*</i>	Outlining the proposed workplan for development within Prices Division over 2019/20. The final version of the Forward Work Programme for Consumer Price Statistics can be found in Annex A of this document.
May 2019	Conceptual foundations of HCIs APCP-S(19)07	Giving feedback on the Household Cost Indices (HCIs) and from the ESCoE workshop following the April publication of HCIs
May 2019	Implementing Alternative Methods for Package Holidays <i>APCP-S(19)08*</i>	Presentation of the development work to enhance the methods for producing Package Holiday item index
Sept 2019	Clothing price relative volatility <i>APCP-S(19)12*</i>	This paper follows up on the action to look in more detail at the impact of changes to the clothing price collection on the volatility of microdata
Sept 2019	Criteria for shortlisting appropriate index methods APCP-S(19)13	This paper sought the panel's views on the appropriateness of the proposed framework to assess index number methods that best meet stakeholder and user needs
Sept 2019	Price collection in a no-deal Brexit scenario <i>APCP-S(19)14*</i>	This paper sets out ONS's plans for ongoing price collection in the event of a no-deal Brexit on 31 October
Sept 2019	Update on package holiday collections <i>APCP-S(19)15*</i>	An update on package holidays price collection actions and proposal for future work

<p>Sept 2019</p>	<p>Prioritising suitable categories for the inclusion of alternative data sources</p> <p>APCP-S(19)16</p>	<p>This paper presented recommended prioritisation of specific product categories to be targeted for implementation of alternative data sources</p>
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*This paper has not been published at this time, for more information please refer to the [published minutes](#)

Note: excludes Terms of Reference, verbal updates, minutes, agendas, administrative papers and letters

Annex A – Forward Work Programme for Consumer Price Statistics

Introduction

The work programme for consumer prices statistics was first included in the 2015 consultation on consumer prices statistics. The [current work programme](#) has since been updated to reflect the outcome of the review, and also to reflect decisions reached by the National Statistician following the consultation. It has also been updated to reflect the views of the Advisory Panels on Consumer Prices following discussion by both the Technical and Stakeholder Panels every May between 2016 and 2019. The programme and priorities also reflect the priority placed on the use of alternative data sources by Professor Sir Charles Bean's [review of economic statistics](#) (commonly referred to as the Bean Review).

We expect that our top priorities for the next few years will be to continue to develop the range of consumer price measures to meet the three user needs identified by the National Statistician – a set of measures consistent with recognised economic principles, measuring the household experience of changing prices and costs, and consulting on the future of the Retail Prices Index (RPI). Our priorities, therefore, are to:

- Embed CPIH as the lead inflation measure in the UK by providing users with a longer time series and more granular data, continuing to provide information and assurances on sources used to compile CPIH, and improving user understanding of the measure
- Continue to produce and improve the CPI so that we have a measure that is comparable internationally
- Work to develop a set of indices that reflect inflation as experienced by household groups
- Consult on the future of the RPI
- Improve all of our consumer price statistics through the use of alternative sources of price and transaction data

Part A – Work programme for alternative data sources

We are currently working through a comprehensive transformation programme for consumer price statistics in order to modernise their measurement and make better use of data and methods that are becoming increasingly available to us.

At a high level, this involves obtaining robust sources of alternative data, development of statistical systems to work with these data, and methodological research in order to effectively classify, validate and construct high quality price indices from new data sources. These new data sources will be used in conjunction with traditionally collected data to improve the accuracy, efficacy and representativity of consumer price inflation statistics.

The data sources that we are investigating are web-scraped data (automated data collection from retailer websites) and scanner data (point-of-sale expenditure and quantity data provided directly by retailers). More information can be found regarding these data sources in our article [Introducing alternative data sources into consumer price statistics](#).

This transformation will be the largest change to consumer price statistics in a generation, and the scale and importance of this work should not be underestimated. We will be reliant on developments in many areas, including the use of new technology platforms and the willingness of retailers to provide us point-of-sale data. Due to the scale of this work, the project has been separated into its own work programme, to allow for more detail to be provided about the various work streams.

Our ambitious roadmap sets out our plans to incorporate alternative data sources into our headline measures of consumer price statistics by 2023. We plan to do this using a 3 phased approach:

- Phase 1 (Research: 2020) involves developing systems and methods for use with alternative data sources, alongside traditional sources and methods.
- Phase 2 (Application: 2021) involves us applying these methods to specific categories as [prioritised with our Stakeholder Advisory Panel on Consumer Prices](#).
- Phase 3 (Engagement: 2022) involves the release of quarterly experimental estimates of the impact of alternative data sources on consumer price statistics, as well as engagement with stakeholders and users about these changes.

The impact of the new data sources and methods will first be available in the published figures in the February 2023 UK consumer price statistics, published in March 2023.

High priority

High priority items are the cornerstone of the development programme and, if necessary, will be prioritised over the delivery of medium and low priority items.

The workstreams listed in the sections below summarise the research into new methods and systems that is required before we can process alternative data sources for the purposes of producing consumer price statistics in Quarter 1 (Jan to Mar) 2023. Where relevant, intermediate implementation dates are also included.

Developing a processing pipeline		
Overview	<p>The pipeline to produce consumer price indices using web scraped data is being built on our in-house distributed system – the Data Access Platform (DAP). The platform is based on a very powerful cluster of computers and provides the users with many software tools to store and analyse data.</p> <p>The pipeline is being designed using a suitable flexible framework that can be applied to all items and data sources in the future consumer basket.</p>	
Implementation	Functionality of pipeline expanded to include locally collected data	Q3 2020
	Complete development of our IT system	Q4 2021
	Use processing pipeline for parallel run alongside existing production system	Throughout 2022

Framework for assessing the quality of consumer prices indices produced using alternative data sources		
Overview	<p>This work will summarise the properties of a desirable index number method and provide recommendations on how a final index number method could be selected for different prioritised item categories, incorporating alternative data sources.</p> <p>The recommendations from this will feed into our final decision on which method/s to choose for implementation.</p>	
Implementation	Final recommendations due on most appropriate index number methods to use given different market/pricing behaviours	Q2 2020
	Shortlisted index number methods built into processing pipeline for further testing	Q4 2020
	Final recommendation on index number methods for each prioritised item category	Q4 2021

Classification techniques		
Overview	<p>The classification project looks at automatically classifying products to a specific item category. This work will recommend which methods are suitable for our prioritised item categories and for different data sources.</p> <p>This work will also include a review of existing item definitions, as some look to be too narrow for automatic classification techniques to work to a suitable level of accuracy (for example, the item definition for women's blouses specifies whether the blouse should open fully, information that is not readily available in item descriptions scraped from retailer websites).</p>	
Implementation	Case studies of different classification methods that are suitable for different types of product category and different data sources	Q4 2020
	Classification pipeline built	Q4 2020
	Final recommendation on classification methods for each prioritised item category	Q4 2021

Expenditure weights for web-scraped data		
Overview	<p>One of the limitations of web-scraped data is that it doesn't provide information on expenditure or quantities of product bought. This work will identify if the lack of expenditure weights at the product level introduces any bias into any index based on web-scraped data, and if we can approximate expenditure weights using alternative data sources like page rankings.</p>	
Implementation	Final recommendations due on if/how expenditure weights can be found for web scraped data at the product level	Q4 2020

Product grouping		
Overview	In the current methodology, the price for an individual product is followed over time and compared back to the price of the same product in the base period. An alternative approach would be to follow the average price of a defined group of homogeneous products instead. Research has shown this to be a viable alternative for categories such as clothing which experience high rates of product churn over time. This will feed into how we define a unique product in the pipeline for identified categories.	
Implementation	Recommendations on different product grouping methods and what scenarios they should be used in	Q4 2020
	Product grouping pipeline built	Q4 2020
	Final recommendations due on whether product grouping methods should be used for each prioritised item category	Q4 2021

Expenditure weights for different data sources/retailers		
Overview	<p>This work will recommend methods and suitable data sources that will allow us to aggregate together alternative data sources with traditionally collected data. For example, traditionally collected data for bread from local bakeries alongside scanner data for loaves bought from large retailers. This will feed into the aggregation part of the processing pipeline.</p> <p>This work will also be an extension of the improvements to shop type weights introduced in Q1 2020. This work will incorporate stratification using data from the Annual Business Survey (ABS) for different types of shops.</p>	
Implementation	Update shop type weights in the CPI and CPIH using ABS data	Q1 2020
	Final recommendations on expenditure weights for aggregation	Q4 2021

The impact of product returns, discounts and product relaunches on alternative data sources		
Overview	<p>The issue of returns affecting expenditure weights for particular categories may impact on how we can use expenditure weights in a final item index.</p> <p>Take-up rates from discounts observed in scanner datasets may be applied to web-scraped and traditionally collected data to ensure consistent treatment of discounts.</p> <p>Product relaunches need to be identified to ensure that quality changes in products are captured and appropriately adjusted for over time.</p>	
Implementation	Final recommendations on treatment of returns, discounts and product relaunches	Q4 2020

Using data elsewhere in basket pre-2023		
Overview	<p>There are areas in the inflation basket that may benefit from the use of alternative data sources prior to our key implementation milestone in 2023.</p> <p>The hedonic modelling process for technological goods currently involves the use of hundreds of manually collected data to produce regression models. Web-scraping therefore has the potential to improve the efficacy of data collection for use in hedonic modelling, without feeding directly into the indices produced.</p> <p>There are also some categories in the inflation basket where it may be appropriate to replace existing data collection procedures with web-scraping in-house. For example, we are developing a “robot tool” that sends an email to price collectors when a website changes. This may be useful in cases where we know prices to be relatively static, such as passport fees.</p> <p>We are also building more advanced web-scrapers to scale up our capability to web-scrape retailers’ websites.</p>	
Implementation	Supplement hedonic collection “test data” with data from alternative data sources	Q4 2020
	Parallel run advanced web-scrapers for motorbikes with live collection	Q4 2020
	Build and parallel testing of robot tool for items with relatively static pricing structures within the basket	Q4 2021

Expanding pipeline functionality		
Overview	<p>Improvements need to be made to some of the existing functionalities within the current pipeline. For example, the current functionality uses very basic outlier detection methods (for example, min/max checks) and imputation approach (price carry-forward method).</p> <p>Better methods need to be understood and developed, in line with international best practice in price indices and big data.</p>	
Implementation	Recommendation of outlier detection methods for use with alternative data sources	Q4 2020
	Recommendation of imputation methods for use with alternative data sources	Q4 2020
	Review of pipeline functionalities and any further research/improvements that are needed	Q4 2020

Part B – Work programme for the range of consumer price statistics

High priority items

High priority items are the cornerstone of the development programme and, if necessary, will be prioritised over the delivery of medium and low priority items.

Developing Household Cost Indices (HCIs)		
Overview	<p>The concept of a Household Costs Index (HCI) was first proposed by Astin and Leyland (as the Household Inflation Index, HII), culminating in a paper⁵ submitted as a response to the 2015 consultation on consumer price statistics. Suggested differences from existing measures of price change include the potential inclusion of asset prices and interest payments, plus giving each household's expenditure equal weight. Following the consultation, the National Statistician decided that the HCIs could serve as an important complement to the suite of consumer price indices.</p> <p>Work has now commenced to develop these indices, releasing focused analytical articles throughout 2017 and beyond that will help shape the production of the final measure. ONS has subsequently engaged with its advisory panels on a number of development issues. Initial experimental indices were published⁶ in December 2017 with an update in April 2019, but there are a number of concepts that will need to be explored further. In his statement of 28th June 2019 the National Statistician confirmed plans to produce further experimental publications on an annual basis throughout the development phase, moving to a test run of quarterly production in 2022. Moreover, once National Statistic status for HCIs has been achieved, we will look to develop a HCIs variant (the HCIs – Capital, or HCICs) which will additionally include capital payments for owner occupied housing.</p> <p>Following the 2015 consultation on consumer price statistics, the National Statistician reached the decision that ONS should produce comparable measures of income and price change for different household groups on an annual basis in one publication. We will engage with users to shape further development of the measures.</p> <p>Much consideration has gone into how comparable measures of income and price change should be produced, and work in the area suggests there may be a case for a 'family of indices' to deflate income using different definitions. As such Household Costs Indices may be appropriate to be matched to a microeconomic measure of income. This item ties in with ESCoE's work stream on democratic measures of income growth which aims to make a wider range of measures available to policy-makers.</p>	
Implementation	Release third revision of the experimental Household Costs Indices	Q2 2020
	Supporting methodological article for the third revision of the experimental Household Costs Indices	Q2 2020

⁵ [Towards a Household Inflation Index.](#)

⁶ [Household Costs Indices, UK: preliminary estimates 2005 to 2017](#)

	Begin test run of quarterly HCIs production	2022
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Developing a historical series for CPIH		
Overview	<p>CPIH, the lead measure of inflation, is the most comprehensive measure of consumer price inflation, given its inclusion of owner occupiers' housing costs (OOH). The current time series extends back to 2005, which is when the rental data sources used to calculate the OOH component for England begin.</p> <p>To increase the usability of CPIH and provide a longer commentary on the impact of owner occupiers' housing costs on inflation, a historical series will be modelled for CPIH.</p> <p>In January 2018 both Advisory Panels on Consumer Prices considered a proposed methodology for the historical series, and the series from 1988 to 2004 was published in December 2018. The series from 1947 to 1987 is being investigated further.</p>	
Implementation	Further methodological development work on the early part of the series	Q3 2020
	Publish the CPIH historical series for 1947 to 1987	Q4 2020

Medium priority items

Medium priority items form an important part of the work programme but if necessary delivery may be delayed for high priority items.

Developing measures of accuracy for CPIH		
Overview	<p>Due to the complex survey design, calculating standard errors for CPIH and specifically the growth in CPIH is very challenging.</p> <p>There are 2 dimensions to the sampling: selection of items and selection of outlets. The sampling involves purposive sampling of both items and outlets. The CPIH weights come from a variety of sources. Some are administrative sources, some are survey-based. They are then put through national accounts balancing. This all makes the estimation of sampling errors difficult.</p> <p>Also, CPIH weights are price-updated using movements in the appropriate CPIH index, so there is an interaction between weights and prices. Annual rates of change in the price index are ratio estimates, usually over a chain link, so there may be correlations between prices in successive periods that need to be taken into account.</p> <p>An article on the effect of variance in the weights of CPIH was published in Autumn 2017⁷, and work on the effect of variance in the prices was reviewed by the Advisory Panels on Consumer Prices in 2018. The work will be prepared for submission to an academic journal in 2020.</p>	
Implementation	Submission of work to estimate the variance in CPIH	Q2 2020

⁷ [Survey Methodology Bulletin, Autumn 2017](#)

Review of quality adjustment and monitoring of quality change		
Overview	<p>One of the more difficult issues in producing consumer price inflation statistics is the accurate measurement and treatment of quality change due to changing product specifications. The Johnson Review considered quality change and recommended ONS provides more information to explain how quality change is monitored. In response to the 2015 consultation on consumer price statistics some users suggested that ONS should devote more resources to improving and monitoring methods of quality adjustment. In particular the quality adjustment of services could be given more consideration. The Bean Review⁸ also considered quality change and found that the issue is likely to grow in importance with the “spreading tentacles of the digital revolution”.</p> <p>To address these findings a project has been initiated to review quality adjustment methods used in consumer price inflation statistics and provide more detail on how quality adjustment is monitored.</p> <p>This item ties in with ESCoE’s work stream on measuring activity in services sectors, as the project aims to investigate the deficiencies in the current measures of services activities for the UK and how might they be improved.</p>	
Implementation	Monitoring tool for between-year quality changes	Q2 2020
	Implementation of live quality adjustment monitoring	Q1 2021
	Analysis on forced quality adjustment and practical applications of the findings	Q1 2022

Regional indices	
Overview	<p>Amongst other user interest, in February 2018 an Economy, Jobs and Fair Work Committee of the Scottish Parliament recommended⁹ that a price index for Scotland should be given priority. Regional price indices could also improve the granularity of other high priority work such as the Household Costs Indices and subgroups on a CPIH-consistent basis.</p> <p>The regular collection of prices for consumer price inflation statistics is optimised for measuring inflation at the UK level. Prices are collected locally in 141 locations spread across Scotland, Wales, Northern Ireland and the 9 regions of England. As a result, the number of locations visited per region is small, making the data less suitable for regional indices. Additionally, the prices for many products are collected centrally with no regional breakdown. The viability of using the existing price data to produce more geographically disaggregated price indices was assessed in a feasibility report published in November 2017, and the use of small area estimation to improve regional expenditure estimates was explored in a further paper in February 2019.</p> <p>The University of Strathclyde will also deliver a report detailing the research done in 2019. The report will (amongst other things) focus on</p>

⁸ Details of the [Bean review and the final report](#)

⁹ [How to make data count: improving the quality and coverage of economic statistics](#)

	the price data used in the regional CPIH. It will 'assess the temporal stability of the regional price quotes and the capacity for price estimation to be improved using model based methods', along with providing recommendations and proposals for future work and possibilities for regular publication	
Implementation	Ongoing development work towards the production of regional price indices	Q2 2020

Further quality assurance of CPIH		
Overview	<p>As part of the work to seek re-accreditation for CPIH as a National Statistic, we developed a Quality Assurance of Administrative Data (QAAD) document for our consumer price statistics¹⁰. The QAAD highlighted a number of areas where the quality assurance for some data sources could be improved.</p> <p>We continue to seek the required assurance for these sources and will aim to update the QAAD biennially.</p>	
Implementation	Update to the QAAD for consumer price statistics	Q3 2020

Improvements to CPIH methodology		
Overview	<p>There are a number of ways in which the owner occupiers' housing costs (OOH) component of CPIH could be further improved. We intend to explore these potential developments to further improve the effectiveness of CPIH as a measure of inflation. These are described in this section.</p> <p>When the OOH component in CPIH was developed in 2011 using administrative data sources for England, Wales and Scotland, comparable rental data for Northern Ireland were not suitable. At the time the Northern Ireland Housing Executive (NIHE) received private rental data biannually, covering the Belfast Metropolitan Region only. As a result the existing CPI private rental data series for Northern Ireland has continued to be used. Since then the coverage across Northern Ireland has improved and the data are now available monthly. We have received an extract of these data from NIHE and started analysis with the ultimate aim of producing a rental index suitable for inclusion in OOH.</p> <p>Currently, dwelling stock data from the Ministry for Housing, Communities and Local Government (MHCLG) are used to mix- adjust rental data to reflect the OOH market. However, the property type split is not available on a regional basis, so the same property type split is applied across all regions. We will explore other potential sources of data to improve the stratification.</p> <p>The Johnson Review¹¹ identified that recent research into the measurement of rental equivalence has suggested using a flow measure (new lets only), rather than a stock measure (new and existing lets). We</p>	

¹⁰ [Quality assurance of administrative data used in consumer price inflation statistics](#)

¹¹ Details of the [Johnson review and the final report](#)

	will also explore the appropriateness of using this new approach to measuring rental equivalence costs.	
Implementation	Report on the findings of implementing the new rental data source for Northern Ireland in OOH	Q4 2020
	Present findings from investigation into stock and flow measures of rental equivalence	2020
	Improved property type split for stratum weights	2021

Improvements to elementary aggregate indices

Overview	<p>In 2010, ONS made a number of changes to the methodology used to collect clothing prices. These changes meant that the gap between RPI and CPI, which use different formulae at the lowest level of aggregation¹², widened.</p> <p>The work will consider recommendations from the Johnson Review to review and publish the criteria for formula selection at the lowest level of aggregation.</p> <p>This work links to the high priority workstream from Part A on a framework for assessing the quality of consumer prices indices produced using alternative data sources.</p>	
Implementation	Review of criteria for applying elementary aggregate formula, and proposals	Q1 2021
	Impact assessment of proposed index criteria	Q3 2021

Low priority items

The delivery of low priority items may be delayed or even stopped to ensure the delivery of high and medium priority items.

Review the existing methodology for reconciliation between CPIH and RPI

Overview	<p>With the move towards making CPIH the preferred measure of inflation, ONS has developed a reconciliation between CPIH and RPI, on a consistent basis with that currently published for CPI and RPI. In the longer term, alternative approaches will be investigated, using detailed item-level information.</p>	
Implementation	Experimental improved reconciliation method	Q2 2022

Improvements to OOH(NA)

Overview	<p>The ONS currently produce an experimental net acquisitions index for Eurostat, as part of a pilot to incorporate owner occupiers' housing costs (OOH) costs into the HICP. Currently there is no weight for the component "existing dwellings new to the household" sector, which means that it is given a zero weight in the aggregation. Moreover, the</p>	
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¹² CPI and RPI: increased impact of the formula effect in 2010 available [here](#).

	weight for the “acquisition of new dwellings” component includes new dwellings outside the OOH sector (that is, the weight is gross acquisitions, rather than net). ONS will explore data sources that could be used to improve this experimental index.	
Implementation	Improved methodology for the net acquisitions index	2022

Inclusion of FISIM in CPIH

Overview	Financial intermediation services indirectly measured (FISIM) are included in the National Accounts measure of household final consumption expenditure (HHFCE) but are not currently included in consumer price indices. The scope of CPI, which is governed by European legislation, is drawn from the same source as HHFCE and the exclusion of FISIM is one of the biggest differences between the two. As CPIH is not bound by the same legislation, we will consider the suitability of including FISIM as a proxy for the service charge that households pay to banks. A review will include consideration of conceptual appropriateness, international practice and methodology used to calculate a price index for FISIM.	
Implementation	Feasibility study on the inclusion of FISIM in CPIH	2022

The extent to which consumers substitute between outlets

Overview	The Johnson Review recommended that ONS should research the extent to which consumers substitute between outlets. For example, this would capture how prices for the same goods have changed with the move from corner shops to supermarkets and from supermarkets to online providers.	
Implementation	Report on the extent to which consumers substitute between outlets	2022