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Advisory Panels for Consumer Prices

2017 Annual Report to the National Statistician

December 2017

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1. Introduction

This is the second annual report from the Advisory Panels for Consumer Prices (APCP) to the National Statistician. The APCP (Technical and Stakeholder) have met separately three times in the year to September 2017, to discuss a number of issues important to the ongoing progress of consumer price statistics in the UK. This report includes a summary of the discussions held by the panels throughout 2017, and the resulting outcomes. These discussions regard 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 APCP recommend to the National Statistician that:
- The National Statistician notes the progress 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, improving the measurement of price changes for clothing and research into measures of income and price change as experienced by households and by different household types.
- The measurement of price changes for clothing items is challenging with comparability over time difficult to ensure and, given trends in retailing, is likely to become more challenging. Clothing prices needs to remain a priority for the ONS who should take forward a project to consider improvements in data collection and representative sampling, with a particular focus on the use of alternative data sources.
- For the most part, the Household Cost Indices should be developed according to the original proposals; however, there was some disagreement over the inclusion of capital costs, and whether other costs, such as pension payments and savings should therefore be considered in scope. To resolve this, the panels also recommended that a clear set of principles should be defined for the HCIs. User views should be sought alongside the publication of the experimental HCIs paper.
- The smoothing of volatile weights in CPIH and CPI should not be incorporated.

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 2017. The Technical Panel typically meet 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 do not necessarily discuss the same papers, but there has been much overlap in the discussions held throughout the course of 2017.

The Technical Panel[1] 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 Panel[2] 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.

Many of the topics that have been discussed by the APCP during 2017 stem from recommendations made by the review and on questions that were raised during the formal public consultation. Other topics surrounded the consumer prices landscape, issues with clothing measurement and proposals to take forward work to improve this area using alternative data sources.

4. Topics discussed in the past year

The APCP (Technical and Stakeholder) have met separately 3 times in the year to September 2017. A number of topics have been discussed by the APCP, including:
- exploring options of work towards improving the measurement of price changes for clothing
- draft proposals for a theoretical framework of the Household Cost Indices (HCIs)
- reviewing quality adjustment methods in UK Consumer Price Statistics
- the forward work programme for consumer price statistics

The Technical Panel have also discussed a number of methodological topics, including:
- producing real income estimates for population sub-groups of households and estimates in changes to household costs
- the inclusion of the cost of finance into the CPIH and HCIs
- the methodology underlying the calculation of weights needed for inflation indices for household groups
- exploring alternative data sources and investigating the use of web-scraped price data
- the smoothing of volatile weights in the CPI and CPIH

In addition, the Stakeholder Panel discussed further topics, including:
- the range of measures required to meet user needs

4.1. Improving the measurement of price changes for clothing

Following the changes made to the measurement of clothing prices in 2010 the disparity between CPI and RPI inflation increased further and, following the Technical Panel and Stakeholder panel meetings in 2016, ONS has returned work on the formula effect to a high priority on the Consumer Prices work programme. Both

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[1] Technical Advisory Panel for Consumer Prices Terms of Reference
[2] Stakeholder Advisory Panel for Consumer Prices Terms of Reference

APCPs suggested further investigation into the measurement and methodology of clothing price inflation and Mr de Vincent Humphreys' paper, *RPI & CPI: a tale of two formulae*, helped to highlight that there are some issues with the current clothing collection. The Technical Panel proposed a number of suggestions to the ONS on how to proceed with this work, including various alternative methodologies and statistical techniques. One approach could be to use alternative data sources, such as web-scraped data. However, some panel members disputed this as they held the view that problems pertinent to locally collected data would still be apparent when using larger datasets.

At the Stakeholder Panel the [Statistics and Registration Service Act 2007](#) was discussed as it governs the development of the RPI. Many of the panel members asked what would constitute a fundamental change to the RPI as any such change would need consent from the Chancellor of the Exchequer, due to legislation. In light of this, and the National Statistician's decision that there would be no further changes to the methodology of the RPI, the panel agreed that an area in which value would be added would be to investigate the measurement of price changes for clothing, particularly in light of alternative data sources that are now available. The Stakeholder Panel also asked ONS to review previous work on clothing in 2011 and 2012.

4.2. Household Cost Indices

Both APCP discussed the Household Costs Indices at length. The Stakeholder Panel recommended that a clear and explicit set of principles around what the HCIs were trying to measure should be provided, when the concepts and purpose of HCIs were put forward. ONS worked together with Ms Leyland and Mr Astin to define a set of principles to help clearly define what is in the scope of the index and that can work as a guide to the construction of the HCIs. There were two proposals offered to the panels, one from Ms Leyland and Mr Astin, and another from the ONS. However, the two proposals were not considered to be much different in the approach to calculating the HCIs, but varied in their ideas of the presentation and wording of the HCIs.

Some Technical Panel members felt that the focus should be on subgroups rather than an aggregate measure and noted that how the population is grouped affects the aggregate measure. In addition, several panel members thought that income should not be discussed when defining the index and questioned whether the index would be constrained by any income measure it may be matched with.

Following the proposed principles and a theoretical framework for the HCIs, the panels considered the scope of the index. There was discussion surrounding the appropriate owner-occupiers' housing costs (OOH) measure to use, but no consensus was reached. The majority of panel members agreed that the choice of payments was the most appropriate.

Both APCPs discussed all features of the HCIs and there was a consensus reached that a democratic approach to weighting should be used as well as a payments approach to measure OOH and there was agreement about insurance in both panels. The Technical Panel felt that overseas expenditure should be included. The treatment of second hand goods was also discussed and it was advised that the inclusion of second hand goods needs further thought. The Stakeholder Panel expressed that, as users, they are interested in something that can be used so there

would be merit in looking at what is done by Australia and New Zealand, who produce similar indices. Some Stakeholder Panel members raised that having an aggregated measure for the HCI would mean it would lose its value as an experimental measure of various household types. After some discussion around the capital cost of housing, the majority of the panel felt it should be excluded. As ONS continues to develop the HCIs as experimental statistics, it will publish both with and without capital costs at least in the short-term. The Stakeholder Panel suggested that the ONS should issue a consultation paper alongside the first publication. The panel also agreed that interest on credit card debt and council tax should be included and there was general agreement on the treatment of insurance and taking a payments approach for tuition fees.

4.3. Population sub-groups

The Stakeholder Panel discussed the population sub-groups being produced for both the CPIH and the HCIs. The panel gave many suggestions for what sub groups could be looked at including; retired/non-retired, with/without children, urban/rural and regional due to the effect of London. Further suggestions were made such as separating groups by income deciles and those who owned a house outright to those paying a mortgage. The panel advised ONS to think of the resource requirement of partitioning the data in this way and the feasibility of some estimates given the available data and sample sizes.

4.4. Including the cost of finance into the CPIH and HCIs

The Technical Panel considered the conceptual appropriateness of including aspects of the cost of credit in the CPIH and the feasibility of including interest payments in the HCIs. The panel agreed that the ONS should investigate further the inclusion of Financial Intermediation Services Indirectly Measured (FISIM) in CPIH and also why other countries do and don't include FISIM. The Technical Panel disagreed that CPIH was the appropriate measure to update the stock of debt, used to calculate gross interest costs for HCIs, and recommended that HCIs be used to update the stock of debt each month, as using HCIs would reflect that money has a different value to different household groups.

4.5. Inflation for household groups: calculation of weights

The Technical Panel discussed the work on the calculation of weights for inflation for household groups. The panel agreed that the method used in previous iterations of the work should be used, which reconciles LCF data with CPIH expenditure totals. When there are large discrepancies between LCF and CPIH expenditure totals and where there are few households that report spending, expenditure on the class should be reapportioned to LCF households based on their expenditure on a higher aggregate. Another issue the panel discussed was which vintage of LCF data to use to reapportion CPIH expenditure totals and the panel proposed that the ONS do some initial analysis to make a comparison between the proposed vintages.

The panel agreed that it would be necessary to use 3 years of pooled data. There was a further suggestion that each year of LCF data should be scaled to HHFCE data for that year and then pooled.

4.6. The range of measures needed to meet user needs

The Stakeholder Panel discussed 3 use cases that the ONS identified around the CPIH, the HCIs and the RPI. Some panel members felt that ONS should advise on the use of the indices and that the National Statistician should do more to discourage the use of the RPI; the importance of ONS' independence from the government was noted. A number of panel members felt that the CPI should have greater acknowledgement within the document and that the document should more explicitly reference the HICP. There is still much to consider with regards to the presentation of the HCIs.

4.7. Forward work programme for consumer price statistics

In May 2017 both APCPs discussed the forward work programme and priorities for consumer prices. The Technical Panel proposed that the consumer prices work programme should tie in with the wider prices work programme as the work is likely to be complementary. Members discussed that work in producing CPIH subgroups will be used as a building block for HCIs development.

The Stakeholder Panel suggested that relevant ESCoE (Economic Statistics Centre of Excellence) projects should feed into the work programme as appropriate; for example, the work on democratic income, or the work on quality adjustment of deflators. Members also discussed raising the priority of modelling a historical series for CPIH as there is a strong need for it.

The programme has been updated following comments from both APCP. More information can be found in section 5 and the updated work programme is provided in Annex A.

4.8. A Review of Quality Adjustment in UK Consumer Price Statistics

Both APCP discussed initiating a review of quality adjustment in Consumer Price Statistics, in which the ONS review quality adjustment procedures by looking in detail at the procedures in place and making improvements if necessary. The panel provided some advice on different monitoring tools and overall felt that the work stream was interesting and worth continuing with.

The Stakeholder Panel endorsed the paper and asked that any further updates and work be brought back to the panel for discussion.

4.9. Reviewing web-scraped price indices and assessing the feasibility of web scraped data within current collection methods

The Technical Panel discussed work that the ONS have been doing to investigate and review the use of web-scraped data in price statistics. The panel praised the work that had been done but gave the view that the latest papers may be overcomplicating the work and suggested that the remainder of this work should focus on improving the current process and using well known methods to calculate indices from the web-scraped price data, before experimenting with new methods. A further suggestion made was that price collectors could collect prices from the web-

scraped database in the same way that price collectors currently do in the field, and use auxiliary information to select the best replacement products. It was advised that ONS should complete the work summarising potential biases, drawbacks and advantages of these methods.

The Technical Panel also discussed the recent strategic change to focus more on scanner data. The Digital Economy Act has provided more opportunity to collect data from companies and the ONS could replicate the Australian Bureau of Statistics phased implementation when it becomes viable.

4.10. Smoothing volatile weights in CPI and CPIH

The Technical Panel discussed the smoothing of volatile weights. ONS followed up on recommendations from the Advisory Panel in May 2016 and provided analysis of different approaches to smoothing, if smoothing was to be considered necessary. The panel did not feel that smoothing was necessary, and some considered it inappropriate unless the technique was used on all items. Some panel members suggested that it could more effectively be treated as an outlier problem instead, but it will not be a priority in the work programme.

5. Forward work programme for consumer price statistics

ONS has a programme of research and development that is aimed at improving and maintaining the CPIH and CPI – ensuring that they continue to meet user needs, make use of new and innovative methods, and are compliant with EU regulations. Since the previous iteration of the work programme, a considerable amount of progress has been made. This includes:

- Regaining National Statistic status for CPIH in July 2017, following the publication of various CPIH supporting documents and further quality assurance work

- the inclusion of Council Tax in CPIH from March 2017

- introduction of a lower level of aggregation (COICOP5)

- introduction of double-price updating the weights, to make the double-chain link consistent with a single chain link methodology

- the publication of CPIH consistent population subgroups in November 2017

- considerable progress towards the production of HCIs and published several analytical articles, with more details to be found in the paper 'Developing the Household Costs Indices'

The programme reflects decisions reached by the National Statistician following the 2015 consultation on consumer price statistics. The consultation followed a review led by Mr Paul Johnson (commonly referred to as the Johnson Review) which took a comprehensive look at how inflation is measured in the UK and made a series of recommendations about the future development of these statistics. 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).

ONS expect that our top priorities for the next few years will be to:

- continue to develop CPIH to meet user needs
- continue to develop the use of alternative data sources such as point of sale scanner data and web scraping
- Continue to develop HCIs with the advice and involvement of APCP
- consider ways to improve the measurement of price change for clothing

For ONS to be at the cutting edge of international research for consumer price indices, the programme will need to continuously evolve in light of new priorities. Therefore we will review and update this work programme periodically and an update will be provided each fourth quarter to the Authority Board via the National Statistician.

In updating the work programme, ONS will continue to seek the guidance of the APCP and engage with experts and users of these statistics. Further details of the forward work programme are included in Annex A.

6. Membership of the Technical Advisory Panel for Consumer Prices[3]

Members

Mr Nick Vaughan	Director of National Accounts and Economic Statistics, Office for National Statistics (Chair)
Mr John Astin	Independent expert – nominated by RSS
Prof. Bert Balk	Erasmus University, Netherlands
Prof. Alberto Cavallo*	Massachusetts Institute of Technology, Boston
Prof. Ian Crawford	University of Oxford
Mr Rupert de Vincent-Humphreys	European Central Bank
Mr Peter Levell**	Institute of Fiscal Studies
Dr. Jens Mehrhoff**	Eurostat
Prof. Sir Stephen Nickell*	University of Oxford
Mr Mike Prestwood	Office for National Statistics
Dr Jeff Ralph	Office for National Statistics
Mr Paul Smith	University of Southampton
Dr Martin Weale	King's College London

Secretariat

Mr Christopher Payne	Office for National Statistics
Miss Helen Sands	Office for National Statistics

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[3] Members of the Technical Advisory Panel for Consumer Prices have been appointed for their expertise rather than their institution.
* Members that have stepped down from the panel throughout 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	Office for National Statistics
Mr Richard Barwell	BNP Paribas
Mr Andy Haldane	Bank of England
Ms Jill Leyland	Royal Statistical Society
Mr Mike Prestwood	Office for National Statistics
Mr Dave Ramsden	HM Treasury
Mr Ian Rowson	Ofgem
Mr Andrew Sentance	PricewaterhouseCoopers
Mr Geoff Tily	Trades Union Congress
Mr Nick Vaughan	Office for National Statistics
Ms Sally West	Age UK
Mr Matthew Whittaker	Resolution Foundation

Secretariat

Dr James Tucker	Office for National Statistics
Miss Jaya Jassi	Office for National Statistics

8. Papers presented to the Technical Advisory Panel of Consumer Prices in 2017

Date	Title	Summary
Jan 2017	RPI and CPI: a tale of two formulae *APCP-T(17)02*	Mr de Vincent-Humphreys presented his paper which highlighted issues pertinent to the measurement of clothing prices in consumer price indices.
Jan 2017	Re-addressing the formula effect *APCP-T(17)03*	This paper described the legislation and political context around current statistics on consumer price inflation, and asked the panel to consider how work on addressing the formula effect might be taken forward in light of this.
Jan 2017	Review of web-scraped price indices *APCP-T(17)04*	This paper set out the initial plans for a methodological review of the price index formulae that are available for use to calculate indices from high frequency and high volume datasets. Panel members were asked for their views on the approach being taken, the criteria used to assess different methodologies and the strengths and weaknesses of methodologies.
May 2017	The measurement of real household incomes in the UK *APCP-T(17)06*	This was a draft article outlining how comparable measures of income and price change can be produced. Panel members were asked to comment on the draft paper and assess how it impacts ONS work on CPIH subgroups and HCIs.
May 2017	Including the cost of finance in CPIH and HCIs *APCP-T(17)07*	This paper considered the conceptual appropriateness of including aspects of the cost of credit in the CPIH and the feasibility of including interest payments in the CPIH and in the HCIs. Members of the panel were asked for their views on this.
May 2017	Inflation for household groups: calculation of weights *APCP-T(17)08*	This paper reviewed the methodology underlying the calculation of weights that is necessary in order to produce inflation indices for household groups. Members of the panel were invited to comment on the existing methods and advise on any improvements, alternative methods and techniques.
May 2017	Draft work programme *APCP-T(17)09*	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 in May 2016.
May 2017	Chain linking algorithm question *AOB unsolicited*	User query on whether there is a theoretical basis which implies that the current chain linking algorithm is the only one that can be used.

Date	Title	Summary
	contribution	
Sep 2017	A Theoretical Framework for the HCIs *APCP-T(17)11*	Following advice from the APCP-S in May, this paper offers two proposals for a theoretical framework for the Household Costs Indices, for the consideration of the APCP-T.
Sep 2017	Review of quality adjustment in consumer price statistics *APCP-T(17)12*	This paper presented a brief overview of a proposed quality adjustment review in consumer prices and some of the work planned. It also contains details of some of the research to date.
Sep 2017	Assessing the feasibility of web scraped data *APCP-T(17)13*	The aim of this paper was to discuss the feasibility of web scraped data to supplement the current collection process for the centrally collected items of the CPIH basket of goods and services. Panel members were invited to comment on the overall methodology, the items that are being used and tested, cleaning techniques and the frequency of collection.
Sep 2017	Smoothing volatile weights *APCP-T(17)14*	This paper followed up on recommendations from the Advisory Panel in May 2016. A paper was presented at this panel and an action followed for ONS to provide additional research in to the best methodology to use to smooth volatile weights. This paper reviewed the analysis undertaken on smoothing volatile weights.
Sep 2017	Effect of using the current chain linking algorithm *AOB unsolicited contribution*	User query on the likely scale effect of using the current chain linking algorithm.

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

9. Papers presented to the Stakeholder Advisory Panel of Consumer Prices in 2017

Date	Title	Summary
Date	**Title**	**Summary**
Jan 2017	RPI and CPI: a tale of two formulae *APCP-S(17)03*	Mr de Vincent-Humphreys presented his paper which highlighted issues pertinent to the measurement of clothing prices in consumer price indices.
Jan 2017	Re-addressing the formula effect *APCP-S(17)04*	This paper described the legislation and political context around current statistics on consumer price inflation, and asked the panel to consider how work on addressing the formula effect might be taken forward in light of this.
Jan 2017	Population sub groups *APCP-S(17)05*	This paper explored the population sub-groups that ONS are able to produce for both the Consumer Prices Index including owner-occupiers' housing costs (CPIH) and the Household Cost Indices (HCIs; formerly known as the

		Index of Household Payments). It also described the different methods of weighting that could be used.
May 2017	Future landscape of inflation statistics *APCP-S(17)07*	This was a draft article outlining how comparable measures of income and price change can be produced. Panel members were asked to comment on the draft paper and assess how it impacts ONS work on CPIH subgroups and HCIs.
May 2017	Household Cost Indices *APCP-S(17)08*	This paper attempted to explain and justify the concept of the Household Costs Indices and outlines a number of decisions that have already been taken or will need to be taken by ONS in developing the indices.
May 2017	Draft work programme *APCP-S(17)09*	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 in May 2016.
Sep 2017	A Theoretical Framework for the HCIs *APCP-S(17)11*	Following advice from the APCP-S in May, this paper offers two proposals for a theoretical framework for the Household Costs Indices, for the consideration of the APCP-S.
Sep 2017	Improving clothing measurement in consumer price inflation statistics *APCP-S(17)12*	This paper set out proposed plans to take forward work on the formula effect, taking into account the current strategic direction for consumer price inflation statistics. Members of the panel were invited to comment on forward plans and advise on project aims, objectives and deliverables.
Sep 2017	Review of quality adjustment in consumer price statistics *APCP-S(17)13*	This paper presented a brief overview of a proposed quality adjustment review in consumer prices and some of the work planned. It also contains details of some of the research to date.

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

Annex A – Forward Work Programme for Consumer Price Statistics

Introduction

The work programme reflects decisions reached by the National Statistician[4] following the 2015 consultation on consumer price statistics[5] and a statement outlining the National Statistician's formal response to the consultation[6]. The consultation followed a review led by Mr Paul Johnson (commonly referred to as the Johnson Review) which took a comprehensive look at how inflation is measured in the UK and made a series of recommendations about the future development of these statistics[7]. 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)[8].

We expect that our top priorities for the next few years will be to:
- continue to provide information and assurance on sources used to compile the CPIH
- continue to develop the use of alternative data sources such as point of sale scanner data and web scraping
- continue to produce a measure that better reflects households' experience of inflation
- publish measures of income and price change as experienced by different household groups
- explore ways to improve clothing measurement, with a particular focus on the use of alternative data sources.

For us to be at the cutting edge of international research for consumer price indices, the programme will need to continuously evolve in light of new priorities. Therefore we will review and update this work programme periodically and an update will be provided each September to the Authority Board via the National Statistician.

In updating the work programme, we will seek the guidance of the Advisory Panels on Consumer Prices and engage with experts and users of these statistics.

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[4] Letter from John Pullinger to Andrew Dilnot in which he sets out his emerging thoughts on the future of consumer price statistics
[5] 2015 consultation on consumer price statistics
[6] 2016 statement on future of consumer price inflation statistics
[7] Details of the Johnson review and the final report
[8] In July 2015, the Chancellor of the Exchequer commissioned Professor Sir Charles Bean to conduct an independent review of the quality, delivery and governance of UK economic statistics. The terms of reference, final and interim reports from the Bean review can be found on the GOV.UK website.

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. High priority items are listed in order of implementation (of the first deliverable).

The range of measures needed to meet user needs	
Overview	The National Statistician has alluded to the range of measures needed to meet user needs, which is based on 3 recognised user needs. The first is the need for a set of measures based on macroeconomic principles, calculated consistently with economic concepts and approaches. The second user need is in measuring the household experience, looking at changes in household outgoings or costs as they are experienced. The third user need is for the Retail Prices Index (RPI), due to its existing use in long-standing contracts.

To meet these three user needs we need to:
a) continue to provide information and assurance on sources used to compile the CPIH , improve user understanding of the measure and embed CPIH as the national measure in the UK
b) continue to produce and improve the CPI so that we have a measure that is comparable across the EU, and also internationally
c) work to develop a set of indices that better reflect inflation as experienced by the household, or by household groups
d) continue to publish the RPI as a legacy measure, while making any necessary routine changes

Implementation	Produce initial exploratory Household Cost Indices	Dec 2017
	Future iterations of HCIs research	Dec 2018

Data collection strategy for consumer price statistics	
Overview	Improvements in technologies have resulted in new, alternative, sources of price data which could be used in the compilation of price indices. There are 2 main alternative data sources which could be used, specifically:

- point of scale scanner data - often referred to as scanner data, collected by retailers as goods are scanned across the till; these data are often considered the gold standard for consumer prices statistics as the data include both price and volume information
- online price data – either collected internally using web scraping (using automated robots that scan retailers'

	websites and extract price information) or some other method (for example, using APIs to access the data directly or by sourcing the data from an external supplier) The Johnson Review and Bean Review recommended that ONS should give priority to obtaining these data and developing methods and capabilities to use them. We currently have several streams of research looking at these alternative sources of data. These cover a number of areas including: • testing the collection and processing of grocery price data • investigating the use of online price data in the measurement of clothing prices • undertaking a feasibility study into using online price data to replace the central collection of prices • reviewing appropriate price index methodology for use with alternative data sources • investigating the use of a database of rail fares transactions to improve the rail fares item in CPI • why prices for some items are sourced from the internet, while others are obtained from local shop-based collections[9] These work streams will in turn advise a data collection strategy for consumer prices statistics, which will include recommendations on the use of alternative data sources in the production of consumer price statistics. This item ties in with ESCoE's work stream on measurement issues in the modern economy which is investigating how measurement prices might evolve in light of the digital revolution. It also ties in with another ESCoE project on improving the quality of regional economic indicators in which one area of work is to look at how to construct regional price indexes using new data sources.	
Implementation	Publication of the Data Collection Strategy for consumer prices	Early 2018
	Implementation of improvements to rail fares	Early 2019

Developing Household Cost Indices (HCIs)	
Overview	The concept of a Household Costs Index (HCI) was first proposed by Astin and Leyland (as the Household Inflation Index, HII), culminating in a paper[10] submitted as a response to the 2015 consultation on consumer price statistics. Suggested differences from existing measures of price change include the

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[9] Ibid, Recommendation 11
[10] Towards a Household Inflation Index.

	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.	
	ONS have conducted research into the concepts and issues that were raised in Astin and Leyland's paper and, in August 2016, released a discussion paper[11]. Feedback was provided by a number of key users, as well as the Advisory Panels on Consumer Prices. A summary of the feedback received, along with next steps to further develop the indices, was published in December 2016[12]. Work has now commenced to develop these indices, releasing focused analytical articles through 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 are due to be published in December 2017 but there are a number of concepts that will need to be explored further.	
	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.	
	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.	

Implementation	Release experimental Household Costs Indices	Dec 2017
	Consultation with stakeholders	Q1 2018
	Ongoing experimental publication	Annually
	Explore further improvements that can be made to Household Costs Indices to bring them more in line with the households experience of changing costs	2018 and 2019
	Increase frequency of income and price change publications, using nowcasting techniques to improve the frequency of income measures	2020

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[11] Developing an Index of Household Payments.
[12] Developing an Index of Household Payments, summary of responses

Developing CPIH Subgroups		
Overview	Research we published in 2014[13] shows that different household groups can experience different rates of inflation. Many users have since expressed interest in seeing updates and improvements to this work. The indices will need to be referenced to the CPIH instead of the CPI; given the CPIH is the lead measure of inflation in the UK. The indices could be developed further by differentiating between different products purchased, producing specific prices indices for each household group. 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. 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 CPIH sub-groups may be appropriate to be matched to a macroeconomic measure of income. Household sub-groups will also be produced for the HCIs work, and so this item will be co-ordinated with the previous one.	
Implementation	Engage with users on the best way to proceed with producing CPIH indices for different household groups	Q1 2018
	Initiate a quarterly experimental production of CPIH sub-group indices	Mid 2018
	Increase frequency of income and price change publications, using nowcasting techniques to improve the frequency of income measures	2020

Develop a reconciliation between CPIH and RPI and review the existing methodology for reconciliation
Overview	With the move towards making CPIH the preferred measure of inflation, ONS will develop a reconciliation between CPIH and RPI, and use the opportunity to review the reconciliation method used. This is being looked at experimentally and could help reconcile differences between alternative measures of OOH costs. ONS will seek the advice of the Advisory Panel on Consumer Prices – Technical and other expert users.

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[13] Variation in the inflation experience of UK households: 2003 to 2014

Implementation	Reconciliation between CPIH and RPI published	Mid 2018
	Improved reconciliation method	Early 2020

Improving clothing measurement in consumer price inflation statistics		
Overview	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 aggregation[14], widened. Constructing price indices for clothing items can be problematic. This is because the high product turnover associated with fashion items makes it difficult to identify comparable replacements. ONS will continue to explore the measurement of clothing prices through analysis of the web scraped clothing data provided by WGSN (see use of alternative data sources), as well as considering other ways that the measurement of clothing price changes could be improved. ONS will seek the advice of its advisory panels in this matter.	
Implementation	Report on alternatives to matching and compare methods	Q3 2018
	Report on methodology and compare methods	Q4 2018
	Criteria for elementary aggregates and impact assessment	Q1 2019
	Proposal on improvements to clothing	Q1 2019

Developing a historical series for CPIH		
Overview	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. A modelled historical series has previously been estimated for the CPI[15]. 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.	
Implementation	Publish a methods paper for developing a historical series	Late 2017
	Seek user views on the methods paper	Q1 2018
	Finalised series publish	Mid 2018

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[14] CPI and RPI: increased impact of the formula effect in 2010 available here.
[15] Modelling a Back Series for the Consumer Prices Index, 1950 - 2011

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. Medium priority items are listed in order of implementation (of the first deliverable).

European compliance issues		
Overview	The UK CPI is also the UK's Harmonised Index of Consumer Prices (HICP). The HICP is a measure of inflation produced by all EU member states in line with EU regulations. We are working to ensure compliance through implementing a temporal sample for fresh fruit and vegetables and improvements to the methodology for package holidays. Prices for fresh fruit and vegetables are collected on a single Index Day, a Tuesday, in or around the middle of the month. To address temporal sampling requirements, a second collection day for fresh fruit and vegetables will be implemented in 2018, following a parallel run in 2017. In 2015, Eurostat published the UK Compliance Report[2] which stated that ONS's method for package holiday collection is non-compliant. This is because price relatives for package holidays are calculated by comparing the price in the current month with the price the same month a year ago, rather than comparing the price with December. Work is underway to develop an improved methodology.	
Implementation	Introduction of temporal sampling for fresh fruit and vegetables	March 2018
	Implementation of improvement to package holidays	Early 2020

Developing measures of accuracy for CPIH	
Overview	Due to the complex survey design, calculating standard errors for CPIH and specifically the growth in CPIH is very challenging. 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. 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.

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[2] UK Compliance Report

	Estimates of the variance due to the variance in the LCF data used as weights are currently being investigated. These will give an indication of some part of the accuracy of CPIH.	
Implementation	Further analysis and refinement	Early 2018
	Estimates of the sampling errors associated with central items	Mid 2018

Review of quality adjustment and monitoring of quality change	
Overview	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 Review[16] also considered quality change and found that the issue is likely to grow in importance with the "spreading tentacles of the digital revolution". 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. 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.

Implementation	Report on quality adjustment methods used and how quality adjustment should be monitored	Q1 2019

Improvements to CPIH methodology	
Overview	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. 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

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[16] Details of the Bean review and the final report

	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 in 2019. Currently, dwelling stock data from the Department for Communities and Local Government (DCLG) 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. The Johnson Review[17] 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 will also explore the appropriateness of using this new approach to measuring rental equivalence costs.	
Implementation	New rental data source for Northern Ireland implemented in OOH	Early 2019
	Improved property type split for stratum weights	2020
	Present findings from investigation into stock and flow measures of rental equivalence	2019

Regional indices	
Overview	Relative Regional Consumer Price Levels (RRCPL) are an example of a spatial price index which can be used to compare relative price levels to the UK for the 9 regions of England, as well as Scotland, Wales and Northern Ireland. We publish RRCPLs every 6 years using data collected to calculate Purchasing Power Parity (PPP) Spatial Adjustment Factors (SAF). The last SAF collection took place in 2016 and the data may potentially be used to publish the RRCPL in early 2018. 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

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[17] Details of the Johnson review and the final report

	assessed in a feasibility report published in November 2017. We aim to build on the findings of this report to work towards more robust regional price indices for the UK.	
Implementation	Ongoing development work towards the production of regional price indices	2019

Location boundary review		
Overview	The current sample frame used to select locations for the local price collection was drawn over 10 years ago. While the sample has been updated using rotation of locations and selection of outlets, the location boundaries need to be updated to reflect changing expenditure patterns. Eight new location boundaries are being piloted in 2017 and in 2018 another 15 new location boundaries will be piloted. The new boundaries will be rolled-out over a 5-year period starting in January 2019.	
Implementation	Roll-out of new boundaries	January 2019

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. Low priority items are listed in order of implementation (of the first deliverable).

Discounts		
Overview	Retailers are offering an increasing array of discounts to attract customers. Single product discounts (available to all consumers without conditions) are captured in consumer price statistics. However, many other types of discounts, such as multi-buy offers or loyalty schemes are excluded. The Johnson Review recognised the difficulty of accurately reflecting all discounts in consumer price statistics and recommended that ONS carry out more work in this area, ultimately seeking to reflect a wider range of discounts in its consumer prices statistics. ONS has contracted TNS, the company which collects price information used to compile consumer price inflation statistics, to collect additional discounts metadata for some items which are already collected locally. Field collectors are asked to record information on discounts (including multibuy discounts) on the handheld devices. The pilot will be run on all food and drink items, with the facility to expand to other product groups in the future. Web scraped data are also being used to explore the prevalence of discounts.	
Implementation	Analysis of discounts in alternative data sources	Late 2018

	Analysis of discount data collected locally	Early 2019
	Implement outcome of pilot	Early 2020

Weights	
Overview	The Johnson Review made a number of recommendations to improve the weights used in consumer price inflation statistics. In early 2014 ONS improved the commentary in the annual weights article to explain why weights differ and the publication was also brought forward to coincide with the implementation of the annual weights in the consumer price inflation publication. The review also recommended that ONS consider: i. whether the stratification of items by shop type can be improved[18]; ii. whether weights for some items should be based on more than one year of data to smooth irregular movements (and what causes those movements);[19] ONS is seeking to introduce an appropriate stratification where weights for different types of shops are available and can be updated. ONS developed a proposal to use a three-year moving average to smooth the weights for three volatile items with irregular movement in the CPI and CPIH baskets. The Advisory Panel for Consumer Prices – Technical considered these proposals in May 2016, and again in September 2017, and advised Against using this method. Therefore we will not be pursuing this work stream further.

Implementation	Update shop type weights in the CPI and CPIH	March 2019

Develop alternatives to the use of RPI data	
Overview	Following the 2015 consultation on consumer price statistics, the National Statistician decided that ONS would publish the bare minimum of RPI-related data necessary to ensure the critical and essential needs of existing users are met. To aid users in finding alternatives to the use of RPI data we will: • develop a new method for calculating average prices using CPIH • shift the long run (1750 onwards) inflation series from RPI to CPIH • update the personal inflation indicator (PIC) to CPIH • develop and publish a hierarchy of historical indices

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[18] Ibid, Recommendation 17
[19] Ibid, Recommendations 15-16

| Implementation | Alternatives developed to the use of RPI data | Mid 2018 |

Improvements to OOH(NA)		
Overview	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 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	2020

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	2020

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	Early 2019