

MEASURING INFLATION AS HOUSEHOLDS SEE IT: NEXT STEPS FOR THE HOUSEHOLD COSTS INDICES

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FOREWORD

In 2015, at the request of the Royal Statistical Society (RSS), we published a paper “Towards a Household Inflation Index”. The proposed index was intended as a measure of inflation “as perceived and experienced by households in their role as consumers” - a phrase taken from the Preface to the 2004 International Manual on Consumer Prices¹. In part, our paper was also a response to the Review of Consumer Prices² carried out in 2013-15 by Paul Johnson which saw a possible role, but more limited, for household indices.

In 2017 the then National Statistician decided that the Office for National Statistics (ONS) would develop household indices – now named Household Costs Indices (HCIs) – to sit alongside the macroeconomic indices of CPI and CPIH (with RPI, by then no longer a national statistic, as a “legacy” index). Our paper was used as a starting point. Both of us have been, and one still is, members of the National Statistician’s Advisory Panels on Consumer Prices and we have also at times been consulted directly by ONS. Thus we have followed developments closely.

The initial stage of development as envisaged by ONS is nearing completion. At some point in 2023 quarterly publication will start. However, while Stage 1 is nearing completion, there remain arguments and debates over certain issues. Good statistics are always “under development” with improvements in view or under consideration.

The current paper has been written (also with the support and encouragement of the RSS) to update the 2015 paper, in the light of developments, experience and what we have learnt in the last seven years. It also looks for and discusses the “next steps” in HCI development, outstanding issues and what the indices might be used for and/or replace. As we are approaching the end of the “first phase” of HCI development we believe the time is right to take stock of where we are and to consider, or re-consider, future plans. It is also a good time to start thinking more seriously about the indices’ future use. The current “cost of living” crisis increases the rationale for a review.

We hope this paper will be of help to the ONS and those interested in the future for the Household Costs Indices. Although written in the context of the circumstances in the UK, we hope it may also be of interest to other countries in their quest for a household-oriented CPI.

¹ ILO et al: [Consumer Price Index manual: theory and practice](#) 2004.

² Johnson, P. (2015): [UK Consumer Price Statistics: A Review](#) (UK Statistics Authority)

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OUTLINE OF THIS PAPER

Section A (chapters 1 to 9) looks first at background and general principles and then at individual items where coverage of the HCIs differs from CPI/CPIH. These are all issues which have been broadly agreed and those familiar with HCIs will not find a lot that is new here.

Section B (chapters 10 to 12) discusses other coverage issues. This includes the difficult subject of Owner Occupied Housing (OOH), much of which has been agreed but where we urge another look at the issue of capital payments.

Section C (chapters 13 to 16) covers a range of other topics and potential uses of HCIs.

Appendices provide additional information.

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EXECUTIVE SUMMARY

Ex1. It is widely accepted that the purpose of a consumer price index should determine how it is compiled; a single index cannot meet all needs.

Ex2. The UK's Household Costs Indices (HCIs) are intended to measure inflation as experienced by households; in other words to see by how much a household's disposable income would need to rise to compensate for inflation. They complement indices such as the EU Harmonised Index of Consumer Prices (the UK version of which is known as the CPI), or CPIH, which were explicitly designed for macroeconomic purposes such as inflation targeting or for international comparisons.

Ex3. Since they are intended to measure the impact on the household budget, Indices such as the HCIs should be compiled on a payments basis, as far as practical. Acquisition data can be used when the date of acquisition is identical or close to that of payment. The user cost approach is not normally appropriate.

Ex4. Other key ways in which HCIs differ, or should differ, from "macroeconomic" indices are that they:

- a are weighted on a household (democratic) basis, as opposed to a "plutocratic" basis
- b include interest payments (including mortgage interest)
- c include student loan repayments (in the UK)
- d give full weight to insurance premiums
- e include all housing-related payments made by owner occupiers, including, we believe, at least some elements of capital payments
- f are on a "national" basis, excluding payments by foreign visitors and including, as far as possible, payments by residents when abroad. Macroeconomic indices are on a "domestic" basis, including expenditure by foreign visitors and excluding spending by residents when abroad.

Ex5. The UK Office for National Statistics has been developing HCIs since 2017, with an interruption during the pandemic. Indices are produced for a number of household groupings (by income decile, working age vs retired households, owner occupiers vs private renters vs social renters, households with and without children, households with and without a disabled person) as well as an overall index. The production of indices for different household groupings is an important characteristic of an HCI system.

Ex6. The indices published by ONS so far show monthly data back to 2005 in most cases. Until now they have been produced once a year at most but from 2023 they will be produced quarterly. We trust it will not be long before they are produced on a monthly basis alongside CPI and CPIH.

Ex7. The indices already cover most of the points in paragraph 4. Work remains to be done to produce them on a national basis (point 4f). However, current plans are to include the capital element of owner occupier housing in a secondary index once all the rest of the planned work has been completed. This decision was never debated and we urge that it is. We believe that mortgage capital payments, and also the initial deposit paid by first time buyers, need to be included in the main index.

Ex8. Mortgage interest is currently calculated using the RPI method. Prior to 2010, the series used the standard variable rate of interest; now the average effective rate is used. The use of the standard variable rate – now used in only a minority of mortgages – exaggerates the movement around 2008 when interest rates were cut sharply following the financial crisis. We urge that either the average effective rate is used throughout the series or, better, that the alternative method based on the lenders' model is used (see Appendix A).

Ex9. A key major development in the future will be enabling different household groups to reflect not just the differences in weights but also, where appropriate, differences in the types of products typically acquired. The experience of the surge in inflation in 2022, and concerns that “value” or “own-brand” products were rising in price faster than more up-market brands, has underlined the need to undertake more research in this area. ONS have started some experimental investigation. This will be a very major and long-term project but it is crucial and will deliver a step change in the quality of the indices.

Ex10. Other future developments we would recommend include a review of elementary aggregates used, more consideration of adjustments for quality change and consideration of the name of the series. We have problems with the use of the word “costs” since this can mean not just the item price per unit but the total cost paid in a transaction.

Ex11. The primary goal of HCIs is to measure inflation as experienced by households. This should make either the overall series, or a series for a household group, a suitable index to use when the uprating is aimed at tracking prices or enabling an income to keep pace with inflation. Currently either RPI or CPI are normally used for this purpose. RPI has well-known issues while CPI, and by extension CPIH, were not designed or intended for this purpose.

SECTION A

1. INTRODUCTION

“The Household Costs Indices (HCIs) are a set of experimental measures, currently in development, that aim to reflect UK households’ experience of changing prices and costs. More specifically, they will aim to measure how much the nominal disposable income of different household groups would need to change, in response to changing prices and costs, to enable households to purchase the same quantities of goods and services at a fixed quality. Put simply, the broad approach of the HCIs is to measure changes in the cost of outgoings of households”.

(ONS definition of Household Costs Indices)

- 1.1. Consumer price indices are not only among the most important economic statistics. They have a unique, or almost unique, status in that when used to uprate incomes, prices, benefits or tax thresholds, they directly affect incomes and/or expenditures for practically all households. It follows that public confidence in them is crucial. It is not easy to achieve, since everyone has their own perception of inflation. A serious effort is therefore needed if an index, whether used for uprating purposes or as an indicator of inflation as experienced by households, is to command sufficient public trust and acceptance.
- 1.2. One size does not fit all when it comes to consumer price indices. Different indices are needed for different purposes. As the introduction to the current international manual³ states: “Calculating a CPI cannot be reduced to a simple set of rules or standard set of procedures that can be mechanically followed in all circumstances. While there are certain general principles that may be universally applicable, the procedures followed in practice, whether they concern the collection or processing of the prices or the methods of aggregation, must take account of particular circumstances” and later (paragraph 2.3) “..there can be no single unique CPI that meets all needs.” In theory a whole range of consumer price indices could be developed to match various needs. Such an approach would sow confusion. However, in broad terms we can simplify this by considering two sets of needs. As will be seen in this paper there are clear differences between indices suitable for inflation targeting and other macroeconomic purposes and those which track household experience and can be used for uprating when the object of uprating is to track inflation as experienced by households. This therefore suggests two main indices⁴.
- 1.3. Our core view is that a consumer price index that is used to measure real incomes⁵ or for uprating items such as wages, pensions, benefits or tax brackets must, in addition to being

³ [CONSUMER PRICE INDEX MANUAL Concepts and Methods, 2020](#). International Monetary Fund, International Labour Organization, Statistical Office of the European Union (Eurostat), United Nations Economic Commission for Europe, Organisation for Economic Co-operation and Development, The World Bank.

⁴ We do not forget that an important, but more technical, use of consumer price indices is to deflate relevant elements of national accounts data. Currently CPI is used for this purpose. It would not be a suitable use for Household Costs Indices.

⁵ Incomes adjusted for inflation.

statistically defensible, be recognisable, understandable and acceptable by the person in the street. It must therefore be seen to reflect, as far as possible, the actual experience of households and the pressures on their budgets. In the past this was the aim of consumer price indices; the Retail Prices Index (RPI) was originally conceived in this light. However, the needs of macroeconomic purposes and hence economic theory have come to dominate debate over how indices should be constructed. And, sadly, semantics - for example the various meanings of the words “consumer” and “consumption” – have further confused matters. The box at the end of this chapter gives some amplification of this.

- 1.4. In our 2015 paper, we proposed a Household Inflation Index (HII) that would, in our view, meet the above needs as much as is practically possible. Much of its coverage would be identical or very similar to both the RPI and the UK’s Consumer Price Index (CPI) but there would be some important differences. That in many ways we were going back to the original aims of consumer price indices did not mean that we were attempting to revive what they were. Life has moved on considerably since the RPI was launched in the late 40s/early 50s. The HII (or HCI) is an index which is appropriate to the third decade of the 21st century and which can evolve to suit future needs.
- 1.5. The intention behind the HII (or HCI) was to create an index which, together with sub-indices for different population groups, should become the normal index used to assess inflation as experienced by households. This in turn enables it, and its sub-indices, to be used to measure the growth of real incomes in the UK. We also believe the HCI, or a sub-group of it, should be used for uprating purposes where the aim of uprating is to maintain real incomes or track households’ experience of inflation. We discuss this point later in the paper. It should be a headline index, enjoying equal publicity with the CPI/CPIH or whichever index is used for interest rate setting by the Bank of England.
- 1.6. Why should the HCI be superior to the CPI or CPIH as a general measure of inflation as perceived by households? What are the main differences and why are they important?
- 1.7. We would respond to these questions in the following way. Why should the typical household trust or find credible an index supposed to measure household inflation that:
 - a) does not take account of, or does not track directly, one of their main expenditure items: mortgage payments and other costs of house purchase and renovation
 - b) gives more weight to the expenditure patterns of wealthier households than of other households
 - c) does not take account of interest on loans for a wide variety of purposes, ranging from mortgages to credit card debt to loans for car purchase or other goods
 - d) does not include student loan interest and repayments
 - e) includes only a small part of premiums paid for the insurance of cars, travel, health etc
 - f) does not include Council Tax (which is included in CPIH but not CPI)
 - g) includes the expenditure of foreign tourists in the UK but not UK residents’ expenditure outside the UK.
- 1.8. All of the above points reflect the designs of the CPI and CPIH as macroeconomic indices, for which they are well suited. Using them, or continuing to use them, for uprating

purposes, and indeed as a general measure of inflation as it affects households, seems certain to give rise to a lack of public credibility and acceptability.

1.9. The CPI is the EU Harmonised Index of Consumer Prices (HICP) for the UK⁶. The HICP was designed for a specific macroeconomic purpose. This was to provide a common method of measuring inflation in EU countries that could be used, in particular, to judge if a country met the inflation criterion set out in the Maastricht Treaty which countries have to meet, among other criteria, in order to qualify for entry into the euro area. Subsequently it is also used by the European Central Bank as the target indicator for setting interest rates. Apart from the known and accepted disadvantage that it does not include any measure of owner-occupied housing costs – a disadvantage that is being addressed – it is generally agreed that it is suitable for its purpose. However, even within the Euro area most countries retain their own national consumer prices index as their main inflation indicator, generally using that for uprating purposes.

1.10. Until 2010 this was the case in the UK. Since 2003 the CPI has been used for interest rate setting but the long-established RPI was used for uprating and associated matters. This changed in 2010 when the government decided to switch from the RPI to the CPI for uprating public pensions, certain benefits (when not otherwise constrained) and, subsequently, certain other items. Currently a mix of CPI and RPI, and occasionally CPIH, is used for uprating purposes in both government and private sectors but without any clear rationale as to the choice. This is clearly unsatisfactory.

1.11. Concerns about the UK's inflation indices had existed prior to 2010 but the government's decision in that year turned something that had been largely the concern of a small group of cognoscenti into a much wider issue⁷. The previously little known "formula effect"⁸ became a hot topic. As a result there was an upsurge of discussion and debate and much investigation. The RPI/CPI User Group was formed in late 2011. Its forum on the Statistics User Network has sparked very lively debate - it has had among the most posts of any User Group on the Network.

1.12. The subsequent downgrading and loss of "National Statistic" status of the RPI in 2013, following investigation of the formula effect and the conclusion by ONS that the RPI's use of the "Carli" formula led it to overestimate inflation, increased anxiety among users, many of whom, rightly or wrongly, felt it to be a more realistic index than the CPI. It became clear that with the RPI discredited and unable to be substantially changed (following the outcome of the 2012 consultation on it) another option was needed.

1.13. This issue started to engage both authors of this paper. Originally they were not aware of each other's thoughts and wrote separate papers on it (see Leyland, 2014 and

⁶ See Astin, J. (2021) *Measuring EU Inflation: the Foundations of the HICP*, Palgrave Macmillan, for a description of the development of the HICP. E-book also available at [Measuring EU Inflation | SpringerLink](#)

⁷ The change sparked a legal challenge and an e-petition which exceeded the 100,000 signatures necessary for a House of Commons debate.

⁸ The formula effect is the estimated difference between the inflation rates shown by the two indices that is due to the different formulae used at the first stage of aggregation. It is not the only reason for the difference but it is often the largest element and it is consistently in one direction – i.e. it makes RPI inflation higher than CPI inflation.

Astin, 2014)⁹. They were both surprised and pleased to find that their thoughts were very similar and hence collaborated on the 2015 paper. Meanwhile in 2014 the RPI/CPI User Group had formally endorsed the view that an index designed specifically for uprating purposes was needed and prepared a statement on the topic (see Appendix C). The Johnson review (2015) indicated some support for household indices but very much as secondary indices to be published only occasionally. Further, Johnson’s definition of a household index, as well as being different from that which we propose, did not accord fully with the form of index the User Group wanted.

NOTE ON TERMINOLOGY

Cost of living

This term is used in a number of different ways. We identify three.

First, it is used in a general and somewhat vague sense. Currently there is much talk about the “cost of living crisis” reflecting the impact on the public of current high inflation. This usage is fine as a general concept (apart from its confusion with other meanings) but lacks precision.

Second, it is used to mean the cost of acquiring the essentials for living. The UK’s first official price index, which started in 1914, was the “Cost of Living Index” and was aimed at “meeting [the] basic welfare needs of the working classes”. The problem is defining what is and is not essential and its subjectivity to moral and political forces. The fact that the Cost of Living Index excluded beer, for example, almost certainly at least partly reflected the WW1 drive against alcoholism and drunkenness epitomised in Prime Minister Lloyd-George’s statement “We are fighting Germany, Austria and drink; and as far as I can see, the greatest of these deadly foes is drink”.

Third, is its use in an economics concept known as a “Cost of Living Index” or COLI. In economics the phrase has a special meaning, namely an index which aims to measure the change in outgoings which a household would have to make in order to hold constant some specified standard of utility or well-being. While the meaning is fairly precise its interpretation can be wide. Many papers have been written about the meaning and the compilation of COLIs¹⁰. The approach can even reach the extent of quantifying the value of changes in external factors such as climate change or the quality of public services. UK consumer price indices do not aim to be COLIs – they are Cost of Goods Indices (COGI) measuring the price evolution of a basket of goods and services.

Consumer and Consumption

The use of “Household” in the title of the HCI avoids two words which have led to endless argument among statisticians over the years. In economics the word “consumer” has very specific meanings; it serves as a means of differentiation between current and capital expenditure, referring either to

⁹ Links to these papers no longer work but they are available on request from the authors. astinja@gmail.com
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¹⁰ See, for example, US National Research Council, “At What Price? Conceptualizing and Measuring Cost-of-Living and Price Indexes”. National Academy Press, 2002.

the types of product (“consumer goods”) or the type of purchaser (“consumer”). This distinction between consumer and capital is crucial for the national accounts, but much less so for price statistics. A house is treated as a capital good in the national accounts, but it clearly serves as an item of expenditure to the typical householder, as well as (hopefully) being a store of value. Financial investments such as stocks and shares are of course excluded from the index.

What is a “price”

The HCIs include interest payments. Many would argue, quite reasonably, that there is no “price” associated with, for example, mortgage interest. But we believe that householders regard mortgage interest as an important outgoing, which affects their standard of living: an increase in the interest rate is simply a “price”, or quasi-price, increase. But “costs” is used in the title of HCIs to avoid the issue of whether an interest rate is, or is not, a price.

Acquisition

Another word which creates problems is often used in consumer price index terminology: “acquisition”. In the UK CPI this refers, in the case of goods, to the moment when the purchaser incurs a liability to the seller. In the case of services, it refers to the time when the event occurs, not when the ticket is purchased. “Acquisition” is not a word in very common use. We tend to say “buy” or just “get”. And in any case, it cannot apply to the purchase of services: a service is ephemeral: one takes a ride in a bus, but there is no “acquisition” involved. Similarly with a haircut or a football match attendance. In practice, the acquisition of a service is taken as the first point in time when the service can be used. So one “acquires” a package holiday, paid in advance, at the date of departure, for example.

Average

The general – but vague – sense of the word is broadly well understood. However, there are various ways in which this can be calculated, each of which has relevance for different circumstances. We define below the four most common. In each case n refers to the number of items being averaged.

Arithmetic mean – often simply referred to as the “Mean”. Add up every value and divide by n . A variation on this is the weighted average when items are multiplied by a factor representing their importance – typically in consumer price indices the proportion of household spending they account for – before being summed.

Median – place the items in order of size, value etc. The middle item is the median. If there are an even number of items then the mean of the two items closest to the middle is taken.

Mode – the most common number in the set. If the price of different types of apple are 55p, 50p, 50p, 45p, 45p, 45p, 40p, for example, the mode is 45p.

Geometric mean – all values are multiplied together and the n th root is taken.

2. DEVELOPMENTS SINCE OUR ORIGINAL PAPER

- 2.1. In 2017, the Office for National Statistics (ONS) took the decision to make preparation for the publication of a “household” index. A “landscape” of Consumer Prices was decided, setting out three use cases: CPI and CPIH as measures of inflation based on economic principles; indices looking at how different households experience changing prices; and the RPI as a legacy index. Our 2015 paper was used as a starting point for the second of these. At the end of 2017, the ONS made the first, experimental, publication of the HII under the new name of “Household Costs Index” (HCI) – or, more precisely, the Household Costs Indices since, in addition to an overall index, indices were produced for a number of different household groups. They were also published alongside indices of incomes for the different groups.
- 2.2. Since then, there has been further development of the HCIs with additional publications in 2019 and 2020 and, more recently after a gap due to the COVID pandemic, in May 2022. ONS is now looking towards these being produced regularly and more frequently and applying for them to be assigned the official “kitemark” as a National Statistic. From 2023 they will be published quarterly.
- 2.3. Of course, our paper and our ideas were not simply taken as proposed but subject to extensive discussion and challenge in various fora, as was entirely right. Practicalities were also a factor since the indices had to be capable of being produced by the ONS and within budgetary limitations. ONS staff developed innovative methods to overcome some tricky hurdles, for example in the measurement of student loan repayments or producing the indices on “democratic” principles. Since our original paper we have learnt, and our views have at times been modified, both from the discussions and challenges and from seeing the practical development of the indices. In particular we had underestimated the relative potential importance to users of the different household groupings.
- 2.4. In the meantime, there have been a number of other important developments in the UK environment of consumer price indices. These may be briefly described as follows.
 - a) In 2017, after adding Council Tax to it, the ONS made CPIH its lead measure of inflation. (CPIH otherwise differs from CPI by including a measure of owner occupied housing based on “rental equivalence” - see Chapter 9.) At the same time the ONS stopped publishing a number of RPI derivatives including RPIJ. RPIX and the RPI subcomponents continue to be published.
 - b) In early 2021, the UK Statistics Authority announced that from 2030, the date from which legal constraints on RPI changes cease and the consent of the Chancellor of the Exchequer is no longer required¹¹, RPI methodology will be changed to align it

¹¹ Index linked Gilts issued prior to July 2002 contain clauses that any change to RPI methodology deemed by the Bank of England to be both fundamental and materially detrimental to the interests of their holders, enables the holders to demand immediate repayment at uplifted par. The Statistics and Registration Service Act 2007 mandates that while such Gilts are extant, such changes to the RPI can only be made with the consent of the Chancellor of the Exchequer. The last Gilt subject to this clause matures in 2030.

with CPIH. Effectively, when the transformation is completed, the RPI will have the same growth rates as CPIH although the date used as a reference period would be different. This means that the RPI, which was originally at least partly – many would say largely – a “household” index, will become an index based on economic principles.

- c) Meanwhile, for technical reasons, the RPI is officially no longer regarded as fit for purpose: the Office for Statistics Regulation and the Office for National Statistics have in recent years consistently warned against its use, and it no longer carries the “National Statistic” kitemark. **The UK thus currently has no valid measure of the true cost of inflation as experienced by households**. This is particularly unfortunate at the present time when prices are rising at a historically high rate. This clearly adds to the need for a Household Costs Index. (It must be pointed out that while the RPI was primarily a household index the fact that it was for many years the UK’s sole consumer price index and thus has to meet all uses meant that its composition always had to be something of a compromise. Thus it was never entirely a household index in the way that the HCIs can be.)
- d) In 2020 the UK left the European Union (EU) and in so doing lost the legal requirement to compile and publish the UK Harmonised Index of Consumer Prices (HICP) which is known in the UK as the CPI. Of course, the ONS still produces the HICP (CPI) and it appears has no current intention to cease it. However, the UK no longer has any influence in the international committees which decide on rules for the construction of the HICP.

2.5. A major international development occurred in 2016 when New Zealand started to publish Household Living-Costs Price Indexes (HLPIs)¹². The aim, like the HCIs, is to monitor inflation as experienced by households and, in particular, to examine the experience of different household groups. The methodology that was developed in New Zealand is very similar to that of the HCIs in most respects. The HLPIs are published quarterly, the same frequency as New Zealand’s Consumer Price Index. They are published for 13 household groups and there is also an overall index. (Apart from New Zealand we believe the only country that has so far developed explicit household indices is Australia. The Australian indices are published for a number of household groups but there is no overall index.)

3. HCI PRINCIPLES AND GENERAL POINTS

General

- 3.1. Although the HCI and its sub-indices are essentially “*a measure of price inflation as experienced and perceived by households in their role as consumers*”¹³, no consumer price index can be built on the experiences of individual households. Every household has

¹² See [Insights | Stats NZ](#) for data and [here](#) for summary information.

¹³ ILO et al: [Consumer Price Index manual: theory and practice](#), 2004

its own pattern of expenditure, and its own “personal” inflation rate¹⁴. All a consumer price index can do is to measure the average rate of inflation faced by households generally. This can easily be seen in a simple example. The price of motor cars has a relatively high weight in the CPI. That means that if car prices rise at a higher than the average rate, the CPI will rise accordingly. Should a particular non-motoring household complain about this? Not at all; every household should accept that a consumer price index is an average measure, concealing a wide range of individual household inflation rates. (This is, unfortunately, a fact which is not understood by everyone.)

3.2. The HCI and its sub-indices are constructed according to the following principles:

Basic concepts

- 3.3. Like the CPI and the RPI, the HCI is a “cost of goods” index (COGI) rather than a “cost of living” index. This means that it reflects changes in the prices of goods and services rather than be an attempt to measure changes in the amount consumers need to spend to maintain a level of constant utility.
- 3.4. Unlike a Cost-of-Living Index (COLI) the HCI does not attempt to take account of substitution of products by households, on the grounds that they should not be assumed to compensate for the impact of relative price changes by theoretical assumptions concerning changes in their own reactive behaviour (see box on page 10).¹⁰
- 3.5. The HCI is base-period weighted rather than current-period weighted, thereby placing it in the category (like most consumer price indices) of a Laspeyres-type (Lowe) index. Thus the HCI can be understood by householders as a measure of the expenditure necessary to buy the same (or mainly the same) basket of goods and services that average households chose to buy twelve months earlier. It is a so-called “fixed basket” index.
- 3.6. **Coverage:** All items (goods and services) bought by households that they need or want for everyday living are in scope. Items bought purely as an investment (such as stocks and shares) are not in scope. However items, such as owner-occupied housing (OOH), which are primarily bought for non-investment purposes but can potentially increase or reduce household wealth, are in scope, although there can be debate over their treatment. Owner-occupied housing is far too important an item in the budget of many households to be ignored. For more details and further discussion see Chapter 10.
- 3.7. **Time horizon:** When price indices are used for macroeconomic purposes, the main focus is on the rate of change, i.e. the inflation rate, and in particular the inflation rate over the previous twelve months since that is normally the rate used in the UK as the target for interest rate setting. But any index which is used for uprating purposes has to be capable of showing a broadly accurate evolution of prices over the long-term. Young workers joining a “career-average” pension scheme will find their pensions affected by the inflation index used up to 50, 60 or even more years ahead depending on how long they ultimately live. Index-linked gilts currently have terms going into the 2060s. This means

¹⁴ The ONS has recently relaunched its [personal inflation calculator](#).

that short-term biases or erratic movements which even themselves out over the longer term are less important than for macroeconomic indices. In contrast, persistent biases are important since even if small the cumulative effect over the longer term can be substantial. Because of the long time horizon it will be particularly crucial to deal efficiently with changes in expenditure patterns, the introduction of new products and quality change. The UK is well positioned as regards the first two of these, due to its practice of annual re-weighting.

- 3.8. **Classification system:** It is important that a macroeconomic index uses an international classification system since international comparison is one of its key purposes. It is then clearly convenient that other consumer price indices use the same system unless there are clear reasons to the contrary. The HCI uses a slightly modified form of the EU system, ECOICOP¹⁵ as does CPI and CPIH. The RPI uses a UK classification which generally does not correspond to the CPI. This means that exact comparison of sub-groups between RPI and CPI are often difficult or impossible to make.
- 3.9. **Taxation:** All taxes related to expenditure which are regular and recurring elements of the household budget, other than direct taxes or quasi-taxes, such as national insurance, are in scope. The index therefore includes council tax and stamp duty land tax. Currently it excludes income tax and national insurance contributions; whether these should or should not be included is discussed in chapter 11.
- 3.10. The following chapters discuss differences between HCIs and CPI/CPIH in more detail.

4. ACQUISITION/PAYMENTS/USE

- 4.1. In theory, the cost of an item to the consumer can be measured at different points in time: when the item is acquired (i.e. transferred to the consumer's possession), when it is paid for or when it is used. In practice, none of these measures is entirely achievable. In particular, price collectors have no idea when a good is used, so this principle is only used in practice in a limited number of cases, the treatment of rents and rental equivalence in CPI and CPIH being one of the best known. Nor does it make sense in a general price index to differentiate between payments made in cash or on a credit card. And again, the price collector does not follow individual purchases so has no means of knowing the type of payment. So the usual principle followed, and that followed in CPI, is "acquisition". Strictly speaking "acquisition" cannot be applied to a service, but the principle still applies – see Box at the end of Chapter 1. In practice "acquisition" of a service in the HICP/CPI is defined as the first month in which the service may be used. Thus for, say, a rail season ticket, purchased in December with a start date in January but not used until February, January is the relevant date for the CPI.

¹⁵ EU version of UN Classification of Individual Consumption according to Purpose, COICOP.

- 4.2. It should be noted that acquisition prices are recorded net of any subsequent partial or full reimbursements, such as returnable deposits.
- 4.3. The intention of the HCI, however, is to track household budget costs. Thus in principle it uses a payments basis. Often, however, there is little or no difference in timing between acquisition and payment and this enables the data collected for the CPI/CPIH to be used. But when timing is such that there is a substantial difference between the dates of “acquisition” and actual payment, such as owner-occupier housing costs where a mortgage is involved, it is the payment date which would be relevant for the HCI. Another example is university fees. While some students pay these up front, many take a student loan which is (at the time of writing) repayable only after the student is earning above a certain amount. The cost is thus deferred and spread over many years. And in some cases it is never repaid (see Chapter 7 on student loans).
- 4.4. There are sometimes clear cases where the timing of acquisition and payments should vary, at least in principle, although practicalities may prevent this. Theatre tickets, package holidays and air fares are examples of items which are often purchased and paid for in advance, sometimes many months in advance. Ideally a distinction should be made between the treatment of these in CPI and the treatment in the HCIs.
- 4.5. A more subtle difference concerns UK energy prices between October 2022 and March 2023. As part of the government support package for households aimed at mitigating the impact of the sharp rise in energy prices in 2022, all household bills are being reduced by £66 in October and November 2022 and £67 between December 2022 and March 2023 inclusive (a total of £400) with the cost met by the government. In the CPI the posted prices are used – in other words the actual energy prices without any deduction for the government subsidy. In HCIs, however, it would arguably be correct to deduct the subsidy from the posted prices since this would reflect what households are actually paying.
- 4.6. ***Current position in HCIs:** Mortgage interest, interest payments and student loans all represent items collected on a payments basis. It should also be possible to use a payments basis for services items such as holidays and theatre tickets which are often paid for in advance.*

5. HOUSEHOLD-WEIGHTED VS. EXPENDITURE-WEIGHTED AGGREGATION (“DEMOCRATIC/PLUTOCRATIC” WEIGHTS)

Definitions and nomenclature.

- 5.1. To construct any type of consumer price index for a population requires some method of aggregation in order to be able to calculate the average effect of price changes on all households in the population or the household grouping under consideration. This aggregate index may be computed with weights which reflect either:

- a) average (mean) expenditures of all reference households, or
- b) the expenditure of the average household, that is an average (mean) of the expenditure shares of all households

- 5.2. Method (a) is the classic method used in consumer price indices including CPI and CPIH (as well as, largely, RPI). Weights reflect total spending in the economy on each item, effectively treating consumer expenditure as one single aggregate “super-household”. Implicitly this gives more weight to higher spending households (which will also tend to be those with higher incomes). The more a household spends, the larger the share of total spending that household will represent. Thus the inflation experience of higher-spending households makes a larger contribution to the resulting index than that of lower-spending households. Such weighting has been named “plutocratic”, because of its connotation with the rich.
- 5.3. Method (b) gives equal importance to all households by averaging consumption value proportions over the whole reference population instead of summing the actual consumption values. In other words, each household has the same weight and makes an equal contribution to the index. This type of weighting has been named “democratic”, for obvious reasons. Method (b), unlike method (a), aims to measure the inflation rate experienced by households at approximately the median point of the expenditure distribution.
- 5.4. The two methods produce different weights and thus different measures of overall price change. Although the terms “democratic” and “plutocratic” have been in use for some considerable time in the context of consumer price indices, we feel that, although widely used in the technical literature, they do not meet the scientific aims of neutrality and objectivity. This paper will therefore refer to them respectively as “household-weighted” and “expenditure-weighted” indices.

Purposes of household- and expenditure-weighted price indices

- 5.5. The two types of index serve different purposes. Expenditure-weighted aggregation is normally considered more appropriate for consumer price indices which are designed for use as a general macroeconomic indicator. On the other hand, as pointed out in the former international Consumer Price Index Manual, Chapter 18 (ILO, 2004), household-weighted indices are generally considered more appropriate for consumer price indices which are designed for use in uprating or indexation. The more recent 2020 Manual also acknowledges this (paragraph 3.16) but adds that it is rare to find an index based on “democratic” weights. It is indeed more difficult to do this from survey data but to its credit the ONS has managed to derive a system.
- 5.6. The reasons for the preference for expenditure-weighted aggregation for macroeconomic indices are not difficult to understand. Macroeconomic uses, such as estimating the overall national inflation rate – and making international comparisons of inflation – clearly require data based on total consumption. So also does the use of price indices in deflating current-value estimates in the national accounts.

Household-weighted index need for HCIs

- 5.7. It would appear to be almost axiomatic that an index measuring household inflation should, at least in principle, use the household-based method of weighting. The HCI is based on the inflation experiences and perceptions of typical households – that is, typical with respect to household expenditure.
- 5.8. The expenditure-weighted approach is, on the other hand, unlikely to reflect the expenditure levels and consumption patterns of the typical household. In fact, a pioneering ONS paper by Flower and Wales (2014)¹⁶ concluded that the CPI is broadly representative of the price experience of households around two-thirds of the way up the expenditure distribution.

Current practice

- 5.9. The UK CPI (and also CPIH) uses – as indeed it should, bearing in mind its purpose as a macroeconomic index – the expenditure-based method of aggregation. The RPI is somewhat different. It does use the expenditure-based method, but it comes some way towards a household-based index by removing from the weights the expenditure of the extreme ends of the population distribution¹⁷ (a variation of a general method known as “trimming”). Trimming removes the influence of extreme values from the mean value, rendering the latter more representative of the distribution¹⁸. There is a reason for this practice for the RPI. When introduced in 1956, its aim was to measure “*average price changes for households which would include practically all wage earners and small and medium salary earners*”.¹⁹ Excluding these groups, which had very different expenditure patterns to the majority of households, therefore made sense.
- 5.10. **Current position on HCIs:** *HCIs - both the overall index and the sub-indices - are produced as closely as practical with household based weighting and have been since the first publication in 2017. An important point is that households are “equivalised” – that is adjusted to compensate for different household sizes. The process weights people in households, taking account of the fact that larger households do not need to adjust their expenditure proportionally to the number of people compared with smaller households.*

¹⁶ Flower, T. and Wales, P. “[Variation in the Inflation Experience of UK Households: 2003-2014](#)” Office for National Statistics, December 2014.

¹⁷ To be precise, the expenditures of the highest-income 4% of households and also that of pensioner households which derive at least three-quarters of their total income from state pensions and benefits.

¹⁸ However an ONS paper “[Investigating the impact of different weighting methods on CPIH](#)”, November 2017, found that trimming made little difference.

¹⁹“[Interim Report of the Cost of Living Advisory Committee](#)”, 1951. HMSO, Cmnd. 8328.

6. TREATMENT OF INTEREST PAYMENTS

Current status in UK consumer price indices.

- 6.1. As macroeconomic indices, CPI and CPIH do not include any form of interest payment. Mortgage interest payments (MIPs), but no other interest payments, have been covered in the RPI since 1975, following a recommendation by the RPI Advisory Committee. From 1987 a version of RPI excluding MIPs, known as RPIX, was introduced. This was later used as the target when inflation targeting was introduced as a means of economic management in 1992. RPIX is still published.
- 6.2. The remainder of this section looks at MIPs in detail and then at other interest payments. MIPs are also considered in Chapter 10 on Owner Occupier Housing Costs.

Economic arguments for and against inclusion of MIPs

- 6.3. In national accounts methodology interest payments were traditionally considered as “transfer payments” rather than “expenditure” - something that does not have a counterpart in economic activity but is a purely financial transaction. In recent years this has been modified by including the “service” element (essentially the difference, known as FISIM or “financial intermediation services indirectly measured”, between interest charged by a financial institution on loans it makes and interest it pays on deposits since this is partly how a financial institution makes its money and is therefore an implicit payment for its services).
- 6.4. These are concepts that make sense in the context of national accounting but are not very meaningful from the point of view of households’ perception and experience.
- 6.5. It has often been argued that since interest cannot be described as a good or a service, it has no place in a consumer price index. It can, though, be argued that interest paid on a loan should be included as part of consumption since it satisfies the consumer’s “needs or wants” (para. 1.3, ILO, 2004) to enjoy a good or service now rather than later. On a more practical level, the HCI aims to reflect the monetary outgoings (other than savings) of households; there can be no doubt that payments of mortgage interest are a “monetary outgoing”.
- 6.6. It is a fact that for owner-occupier households with a mortgage, the payment of the mortgage (both interest and capital) is usually a major item of household expenditure. Moreover, if the interest rate is variable, the level of expenditure is beyond their control. This places MIPs in a different category of expenditure from most other products, where the impact of price rises (including those caused by tax increases) can often be reduced by substituting to other products. Mortgagors are, in contrast, often “trapped” in their repayment levels. It is therefore entirely justifiable to include MIPs in a household-based consumer price index such as the HCI.

6.7. The international “Practical Guide to Producing Consumer Price Indices²⁰” (United Nations et al., 2009) has this to say:

“It is sometimes argued that this [payments] option is more consistent with the traditional approach to CPI construction, which is a carry-over from a time when the CPI was mostly used as a compensation tool. It also has much to commend it from the point of view of public acceptability. It measures costs directly, thereby avoiding imputation. In addition, “mortgage interest” is more likely to be understood than “rental equivalence” and, unlike the latter, the index will reflect changes in house prices and interest rates.”

6.8. HCIs are, as already noted, based on the fundamental purpose of a consumer price index, described in the international Manual as “essentially a measure of price inflation as experienced and perceived by households in their role as consumers” (ILO et al., 2004).

Other types of interest

6.9. Mortgage interest may be the largest category of household interest payments, but it is by no means the only one. People incur loans for a wide variety of purposes: the purchase of cars and other household durables such as televisions and washing machines; for the financing of expensive holidays, and – not least – for educational purposes, notably so-called “student loans”.

6.10. Very large amounts of interest (at rates sometimes above 20% per annum) are charged on bank and credit card debt. This has been a growing phenomenon in recent years. In recent years another type of general purpose loan has achieved importance, if not notoriety, namely the so-called “payday loans” – which are often relatively small but often carry high rates of interest.

Measurement of monthly “price” changes of interest payments

6.11. The word “price” is not usually used in references to changing interest payments. A person seeking a loan, for whatever purpose, will wish to know what the rate of interest is, whether or not it is variable over time, and how it is to be repaid. This is not referred to as its “price”, though it has much in common with the normal understanding of that word. In fact people talk about “shopping around” for a mortgage. But the fact is that a loan carries a price in the form of the level of the interest rate and the rules surrounding its management. These rules may be set by law, as is the case with student loans. More commonly they are set by the lender, and may alter over time.

6.12. **Current position on HCIs:** *In addition to mortgage interest payments, HCIs currently include interest payments on credit card debt, overdrafts and personal loans and loans associated with mail-order purchases. To date no method of including pay-day loans or similar has been found but such interest should in principle be included.*

²⁰ [Practical Guide to Producing Consumer Price Indices \(Compilation guide, Consumer price index, CPI, Data collection, Data sampling, Handbook, Index compilation, UNECE\)](#)

7. STUDENT LOANS

- 7.1. The actual fees paid for university and other higher education courses are of course within scope of the HCI. While some students (or their parents) cover the cost “up front”, many do not, and take out a “student loan” for this purpose. The aim of a student loan is to allow the fees to be spread over a long period of time. The loan may also extend to cover students’ subsistence costs. So the repayment, with interest, of student loans is an expense which many ex-students have to bear for many years. It may be noted that until 2022 the rate of interest was indexed to the Retail Prices Index (RPI) plus margin of up to 3 percent. Caps on interest rates were imposed in 2022 and from 2023/24 the rate for new students will be RPI only. It is no part of our role to question this, but it is perhaps relevant to note that the RPI (which no longer carries the “National Statistic” kitemark) normally has an inflation rate about 1 percentage point above the CPI, and the latest available RPI annual inflation rate at the time of writing, for December 2022, was 13.4% while that for CPI was 10.5% .
- 7.2. Repayment of the loan, together with the interest element, is a part of former students’ regular household expenditure. It is normally deducted from monthly payslips if the person is in employment, and is often regarded by the payee as a form of taxation – though it is not. And, rather like mortgage payments, it is unavoidable once the initial transaction (the agreement to take a course of study, like the decision to buy a house) has taken place.
- 7.3. **Current position:** *in the HCI, the cost of the repayment of student loans is included (both “capital” – the actual cost of the fees - and interest). Thus university fees are included only with a weight appropriate to the share of them that were paid up front. For the remainder, there are separate items in the index corresponding to interest on and repayments of student loans.*

8. INSURANCE PREMIUMS

Introduction

- 8.1. The purpose of insurance is to protect a household against relatively rare events which, if they occur, may be very costly. In any given year, the proportion of households making, say, a claim on their domestic policy is rather small. Putting this the other way around, most households with a domestic insurance policy may pay premiums for many years without making a claim. The premiums they pay may well be a significant item of household expenditure, and thus should be taken into account in a household-based inflation index.
- 8.2. A distinction has to be made between “insurance” and “assurance”. In the case of insurance, claims are only paid if the event insured against occurs. Life **Assurance**,

however, is a form of saving for an event which is relatively probable or even certain – e.g. reaching a certain age or death upon which the policy pays out. As a form of saving this is a financial transaction and thus not included in consumer price indices; we consider its possible place in Household Costs Indices alongside discussion of pension contributions. Life insurance policies pay out in the event of death or injury during a specified period only. For example, parents might take out a life insurance policy to benefit their children should they die before their children reach adulthood. If death does not occur during the specified period nothing is payable.

- 8.3. The greater part of all insurance premiums paid by households is effectively recycled to those households making claims. The net effect of these outgoings and receipts to a large extent cancel each other out within the household sector. Only that part which is retained by the insurance companies represents a net outflow from the household sector. This is the economic cost of insurance to policyholders.
- 8.4. The “service charge” which can be reasonably accepted as the value of the services supplied by insurance companies to policyholders is thus taken as the gross premium income plus premium supplements, minus the value of claims and any changes in actuarial provisions. This is an approach frequently used in consumer price indices, including the UK CPI, but not the RPI, and is probably the most appropriate approach for an index designed for macroeconomic purposes.

Treatment of non-life insurance in the HCIs

- 8.5. Turning next to the treatment of non-life insurance in the HCIs – we begin with the purpose of paying for insurance, taking motor insurance as an example. The aim is to give householders the opportunity to smooth out over the years the often high costs of repairing or replacing vehicles after losses resulting from accidents or thefts. (Motor insurance is also often legally required to cover third party claims if the driver is at fault.) If not for insurance, motorists would in most years benefit financially because of not having to pay premiums, but when an accident happens they may have to spend very large sums in repairs or replacements – sums which they may not have at their disposal. The pooling process offered by insurance companies thus provides – at a price – the guarantee that a policyholder will be able to pay for the potentially high costs after an accident without disturbing their normal pattern of expenditure. The price is, in principle, the cost of the service provided by the insurance company.
- 8.6. The HCI is designed to be an index which measures inflation as “experienced and perceived by households”. Expenditure on insurance premiums is seen as an often significant part of the household budget, and it is unlikely that the typical householder will take the long-term view and assume that one day in the future they will need to make a claim which will relieve them of the need to pay a possibly large sum in repairs. Indeed, when claims are paid out, the householder does not directly benefit; the claim merely relieves the policyholder from all or part of the burden of paying for repairs etc.

They may continue to pay the premiums even after a claim has been settled – and indeed the premiums may rise as a result of making the claim.

- 8.7. This “household-based” view leads inevitably to the conclusion that the HCIs must, unlike a macroeconomic index such as CPI or CPIH, include the full cost of insurance premiums, without making a deduction for the possibility of future claims. This approach accords with the perception of householders, as required by a household-based inflation index and is the approach that has been adopted.
- 8.8. Continuing with the motor insurance example, an insurance company will typically pay for all or part of the cost of the repair or replacement of a damaged vehicle, with possible other additional costs such as the cost of towing to a garage and transport home for the passengers, as well as liabilities to third parties. In past years, the claim proceeds were often paid to the claimant, who would then disburse them to the repairers etc. Nowadays it is often the case that the insurance company settles the debts direct with the repairers etc. In such cases, the payments from the insurance company are treated as if they were paid on behalf of the claimant, and are recorded in the relevant heading in the household budget survey (LCF) e.g. payments to a repair garage or to a new car dealer. These payments are classified to the appropriate sector in the ECOICOP classification, such as “maintenance and repairs of motor vehicles”.

Weights and prices for insurance

- 8.9. So far this discussion has concerned only the weights for insurance. In the case of those price indices such as the CPI which in principle need to measure the prices of service charges, it is in practice virtually impossible in the monthly time frame of a consumer price index to do so. As a proxy, therefore, the trends in gross (i.e. total) premiums are used in the CPI instead of the trends in service costs. It is unsatisfactory, but it is widely accepted as a second-best measure. For the HCI, however, the situation can be simpler and more correct, since the price of gross insurance premiums is exactly what is required in order to match the relevant weights. We may call this the “gross/gross” approach, as compared with the “gross/net” approach of the CPI.
- 8.10. The example of motor insurance used in this paper can be extended to other types of non-life insurance, such as (a) dwellings insurance (structure and/or contents) which may include all-risks cover for items lost, stolen or damaged when outside the dwelling; (b) travel insurance, covering forms of transport not included in standard motor policies; and (c) medical insurance policies. The same principles as those discussed in relation to motor insurance apply mutatis mutandis.
- 8.11. **Current position re HCIs:** *HCIs include non-life insurance premiums at full (gross/gross) weight.*

9. NATIONAL OR DOMESTIC EXPENDITURE

- 9.1. A macroeconomic index, such as CPI or CPIH, is concerned with inflation experienced on the territory of the country concerned. Thus it should exclude expenditure overseas by residents – for example spending while abroad during holidays – and include spending by foreign residents visiting the UK. CPI and CPIH follow this principle.
- 9.2. In contrast, an HCI should be based on what is called a “national” basis – that is, it would cover all items bought by UK residents whether at home or abroad and would exclude spending by foreign residents in the UK. RPI partly follows this principle in that it excludes spending by foreign residents while in the UK. However, in large part for practical reasons, it has not attempted to track overseas spending by UK residents.
- 9.3. **Current position:** *At the time of writing the HCIs remain on the same basis as CPI and CPIH. The ONS, however, is looking to change this to a national basis, or as close to that as practically possible, within the next year or two.*

SECTION B – OOH AND OTHER COVERAGE ISSUES

10. OTHER OWNER-OCCUPIER HOUSING COSTS

10.1. The items discussed in previous chapters looked at items which are either in the HCIs or whose inclusion is timetabled. We now look in some detail at the difficult issue of Owner Occupier Housing (OOH) Costs. This is a complex issue and to enable this part of the paper to focus on the key decisions, some supplementary information has been moved to Appendix A. We advise anyone who wishes to consider these issues in detail to examine the appendix.

Current coverage

10.2. Currently the following items are included in the HCIs:

- Mortgage interest payments (currently modelled using the RPI method)
- Repairs and maintenance
- Dwelling insurance
- Stamp duty land tax
- Conveyancing charges
- Estate agent fees
- Homebuyers' survey
- Council tax/rates
- Ground rent
- Other house purchasing costs

10.3. However, neither down payments nor mortgage capital payments are included at the moment. Under ONS current published plans, these items will be included in a subsidiary version of the HCI called HCI-C where the second C stands for capital. As far as we are aware this proposal was never debated in any detail and we urge that it be reviewed.

10.4. Chapter 5 on interest payments set out the arguments for including mortgage interest payments in the HCIs, just as they are currently included in RPI and RPIJ. This chapter will therefore look at other costs associated with owner-occupied housing (OOH). However before this we urge that interest rates be modelled using the "lenders' method" which is the system used by lenders to calculate mortgage payments. If this is not possible then we urge as a minimum that the Average Effective Interest rate is used for the whole of the HCI series (or as far back as possible). The reasons for this request, which we do not think are controversial and are aimed simply at improving the calculation of mortgage interest payments, are set out in Appendix A.

The general approach to OOH

10.5. OOH has always been one of the most controversial elements of a consumer price index. Indeed the reason it has not yet been included in the HICP (the EU Harmonised

Index of Consumer Prices) is due to the different views about it held by EU countries and also practical difficulties.

- 10.6. Internationally a number of approaches have been used or proposed. All have their merits – but all are subject to criticism. Theoretically at least four different main approaches are usually considered to be possible. These are:
- a) **Net acquisitions** which looks at the net cost to all households of dwellings new to the household sector. This is the method agreed for, but not yet implemented in, the EU HICP. Among other countries, it is used by Australia and New Zealand in their main Consumer Price Indices. A number of statisticians consider it to be the most appropriate system for an index used for inflation targeting.
 - b) **Payments approach** looking at what households actually pay.
 - c) **User Cost**, usually defined as calculating the cost of purchasing the dwelling at the beginning of a period, using the services of the property during the period and then netting off from these costs the benefit that could be obtained by selling it at the end of the period. Various methods have been proposed for calculating this. They are all complex.
 - d) **Rental equivalence**: the imputed rent that an owner occupier would pay if renting rather than owning their dwelling. Some consider this as a form of, or approximation to, User Cost. This is the method used in CPIH.

10.7. A fifth approach is simply to exclude it. Often the reason is that owner-occupied housing is regarded as capital rather than current consumption. This and rental equivalence are thought to be the most popular globally.

10.8. How to measure OOH has been the subject of many a discussion among price statisticians. A look at the “Housing category” of papers in the Ottawa Group website²¹ will underline this point.

OOH proposals in the HCIs

10.9. Unlike the 1994 RPIAC and 2009 CPAC (see Appendix A), we do not have to struggle with a dual purpose index. We are concerned with an HCI which has a practical application and is designed to measure the impact of inflation on households and not for macroeconomic needs. The needs of ensuring public acceptability and credibility and reflecting the importance of housing expenditure in household budgets are therefore crucial.

10.10. In line with the general theory behind HCIs we believe a payments approach is the way to approach the issue so as to reflect the actual impact on the household budget as closely as possible.

10.11. Rental equivalence is widely used, and it also used in national accounts, but in the real world few would consider this to be a reasonable proxy for owner-occupier costs.

²¹ The [Ottawa Group](#) organises an international meeting of price indices statisticians every two years. All the papers presented at these meetings are available on its website.

Rental and house purchase markets can move in different directions for quite long periods of time. The current period is a clear example of this. Between January 2015 and December 2021, average UK house prices grew by 43% while the experimental index of private rents suggest rents grew by just 12%. And in any case, we must challenge the idea that it is a reasonable step to include “imaginary” payments in a household costs index which takes account of actual outgoings.

- 10.12. Net acquisitions is a better approach. However, two factors caused us to reject it for the HCI. The first is the exclusion of land and the second is that the weight given to house purchase reflects expenditure only on dwellings that are new to the household sector rather than all dwellings. This effectively treats all households as one “super household”. It is a reasonable approach for inflation targeting but not for a household index.
- 10.13. User cost has attractions in theory but methods proposed for it are normally complex and unlikely to improve public credibility of the indices²².
- 10.14. We therefore propose that all elements of actual owner-occupier expenditures – deposits and outright payments, mortgage payments (both interest and capital), mortgage protection premiums, spending on renovations and extensions, repairs and maintenance, stamp duty land tax, legal, surveyor and estate agents’ fees, insurance of dwellings – should potentially be considered in scope. While one or two of these items (for example minor repairs and maintenance) are normally included in a consumer price index, many of the others are not.
- 10.15. We say “potentially considered in scope”. We accept that including some of these, notably capital payments, including extensions, may appear to be a radical departure. There may also be practical difficulties in tracking the actual cost to households of the purchase of a second and any subsequent dwellings since this will normally be partly – indeed often largely – financed by the sum received for the sale of the previous dwelling. We will return to this in a moment.
- 10.16. Dealing with the other elements first, we do not think that any of these are too controversial and, indeed, they are already in the HCIs.

Capital costs

- 10.17. Let us now look in detail at the case for including capital costs: the initial deposit (or down payment, mortgage capital repayments, and extensions or “enhancements” to a home. This was always one of the most controversial elements of our proposal. We accept that there will be challenges in putting some of what we propose into practice but, again, the aim will be to get as close to the ideal as practical.
- 10.18. The issues with housing theoretically can be said to apply to all durables which can provide services for many years after their purchase. What differentiates housing from

²² A good overview of a number of methods of treating OOH is given in the following Ottawa Group paper: [2004 8th Meeting - Diewert Erwin - The Treatment of Owner Occupied Housing and Other Durables in a Consumer Price Index.pdf \(ottawagroup.org\)](#)

other durables is that first it lasts longer than most durables (although some durables – e.g. furniture – can also last for very long periods) and, second, that dwellings normally increase in value over the long term in a country such as the UK where building land is relatively scarce and the population is growing. These conditions would not, of course, necessarily apply in a country with a slow-growing, stable (or even shrinking) population which is not densely populated. (It should be noted that some other items, such as quality jewellery or antiques, would normally be expected to increase in value although we accept that these are normally an infrequent or non-existent part of most households' purchases.)

10.19. The main argument for including capital dwelling costs is quite simply that they are a major item in many households' budgets. We are constructing an index that is acceptable to the person in the street, an index that they can see bears a good relationship to their actual outgoings. And shelter, however it is acquired, is an essential. Excluding these items would seriously damage the credibility of the index. Further, part of any rental payment is recompense to landlords for their own capital outlay so excluding capital costs altogether would be unequal treatment.

10.20. Some of the arguments against including capital costs are easy to dispose of. They are those which are purely due to semantics and to the dominance of national accounting principles in many economists' thinking. The problem as regards semantics is the word "consumer". Does the "consumer" in "consumer price index" refer to "consumers" as people or to "consumer goods"? Along with the international manual on consumer price indices (para. 3.3) (ILO et al, 2004) we assume that the word refers to consumers as people and that the point of a consumer price index is to follow the costs of goods and services that consumers buy.

10.21. But suppose the "consumer" in consumer price indices means "consumer goods"? Here again it must logically mean all things that consumers buy when we are talking about a price index compiled for the purposes outlined. But in national accounts terminology consumption by consumers, or consumer expenditure, excludes housing, which is considered to be investment or capital spending. For national accounts purposes this makes sense, since investment adds to the wealth of the nation and the cost to the household is offset by an increase in the household's assets. But we are not considering national accounts or economic theory here. What we are trying to achieve is the practical exercise of tracking how much consumers need to spend to "satisfy their own needs and wants" to quote again the previous international manual on consumer prices (para. 1.3) (ILO et al, 2004).

10.22. A more serious objection is that there is an investment element to the purchase of a dwelling and that investments should not be in scope of a consumer price index. That there is an investment element is obviously true. (And it may be noted that, as with most other types of investment, prices of dwellings can and do fall as well as rise.) But we are talking about owner-occupiers here, not people buying to let, or those who aim to purchase a property, improve it and sell on (we accept that a very small number in the latter category may live in the property while renovating it but even here the dwelling is

- still providing them with shelter). For many owner-occupiers investment is normally a minor part of the decision to buy which is dominated by factors such as what they can afford, what sort of a dwelling they want, where it has to be and so forth. The “investment” element is usually primarily the wish that the dwelling’s value “keeps up” with housing market trends generally so that the household is not disadvantaged if they wish or have to move or that the house is not subject to risks such as flooding which would cause a fall in relative price.
- 10.23. Further, when a dwelling is sold another is normally purchased, so the actual investment may only be realised on death or towards the end of life. We do not see this as any reason to avoid including the capital element.
- 10.24. Shelter is an essential. Other than those living in an institution, households have either to buy or to rent. Including the payment for one form of obtaining shelter in full while only including part of the cost for the other is unequal treatment.
- 10.25. This brings us to the final objection. This is linked to the potential purpose of the HCI as an uprating tool. The issue raised is that if house prices rise then, if the owner-occupier has an income linked to or influenced by the HCI, they are being rewarded for something that is also making them better off through increasing their wealth. But, importantly, the link is very tenuous; housing is not a liquid asset so the increase in wealth is not always easily realisable and house prices can go down as well as up. And finally the prime purpose of the index is to measure the impact of inflation on households.
- 10.26. This last objection is not without merit. But against that we see the imperative of constructing an index which people will see as properly representing typical expenditure. The prime purpose of the index is to measure the impact of inflation on the household budget, so we argue that capital payments need to be included in the main index. If it is felt inappropriate to have the full weight of these in an index used for uprating, an appropriate adjustment can be made to a separate form of the index or they could even be excluded altogether. In this latter case we could end with the same two series as ONS proposes – HCI and HCI-C – but we would argue that the primary series should be the one that includes OOH capital payments.
- 10.27. Having dealt with the issue in principle, we now make some comments on three separate elements: mortgage capital payments; down payments; and extensions.
- 10.28. ***Mortgage capital payments*** are a major part of the household budget for most home owners for many years. Indeed with 50-year mortgages on the horizon, the distinction between mortgage payments and rent becomes blurred. We urge that these be included in the main headline HCI. Without these we do not think the HCI will be complete. Practically including them will not be a problem if the lenders’ method (see Appendix A) for calculating mortgage interest costs is used since this also provides the capital element.
- 10.29. One small qualification has been mentioned to us. As mentioned in the section on mortgage interest payments, home owners may sometimes borrow against their homes

to fund other purchases since mortgage interest rates are often lower than other forms of interest. While this makes no difference to measuring interest rates, since one interest rate simply replaces another, it does mean that there might be a small amount of double counting since both the item purchased is included directly and its cost would be included in the mortgage capital payment. We do not know how important the practice is but once known an appropriate reduction in weight could be used to address it.

10.30. The initial deposit, or down payment, on the purchase of a dwelling is usually significant. Here though there is a problem. For the first time buyer this is a pure cost – and indeed it is the first time buyer who faces the full burden of house price inflation while – normally – saving for the deposit. There are strong arguments for including this therefore and since a separate house price index is calculated for first time buyers this would seem feasible provided some method can be found for obtaining the needed data. However, for second and subsequent buyers the down payment usually comes in part or, indeed, entirely, from the value of the house they sell in order to purchase the second. While a relatively small amount may come from savings, the extent of the amount that does not come from savings in many cases leads us to suggest that this should be excluded. And this is reasonable, since a first time buyer may have spent many months or even years saving for a deposit on a property which meanwhile is often rising in price.

10.31. ***Extensions and enhancements.*** These cover either an extension to the dwelling or some other improvement the owner desires, from garden sheds to home offices to swimming pools and hot tubs. Some can be financed by an extension to a mortgage whereas others may have to be financed from savings or a fresh loan. Sometimes they are somewhat analogous to the purchase of a property in that they add to living space which the home owner either “needs or wants” whereas others may be purely for enjoyment. Potentially they can all add to the value of the property although the additional value may be small (garden shed) or uncertain (swimming pool, hot tub). Thus they can be considered as a capital item but, again, they meet the criterion of satisfying the owner’s “needs or wants” so should be potentially in scope.

11. DIRECT TAXES AND NATIONAL INSURANCE

11.1. This chapter and the next look at two items which some have proposed including in the Household Costs Indices. Others disagree. We discuss the pros and cons briefly before giving our views.

11.2. Direct taxes – those imposed directly on a person such as income tax and national insurance – are not normally within the scope of a consumer price index, as under national accounting rules they are considered to be transfer payments. Taxes associated with the purchase of a product (such as Value Added Tax) normally are included. Council Tax is included in the RPI (as were its predecessors, the community charge and rates) and in CPIH as well as the HCIs. The inclusion of council tax and its predecessors has not been

without debate²³ but its inclusion has, on balance, been justified through being considered as an indirect tax on ownership or occupation of housing. A secondary argument has been that it is a payment for the services provided by local authorities. As far as we are aware practice as regards local taxes varies in other countries – not least as fiscal arrangements differ – but we understand that the UK is not alone in including our particular form of local taxation in CPIH, RPI and the HCIs.

- 11.3. Looking at other forms of tax, Vehicle Excise Duty and the TV licence fee were initially excluded from the CPI but added in later on Eurostat advice since they are associated with the purchase or use of a good or service; they are already in the HCIs.
- 11.4. As discussed, we are not constrained by national accounts conventions in considering household costs indices. Therefore there is no objection in principle to including direct taxes such as income tax and national insurance. Each of these can be considered as payment for services provided by government – including, of course, the National Health Service. And, in principle, national insurance, as the name suggests, is a form of insurance against such misfortunes as long-term illness or job loss as well as providing funding for the state pension. For a number of years in the UK there was a “Tax and Prices” index which included them.
- 11.5. Nevertheless they are different types of tax than Council Tax. They are levied primarily according to income, are deducted at source and are not influenced, as Council Tax is, albeit indirectly, by the expenditure choices made by the household. An important practical consideration is also that Household Costs Indices will often need to be compared with an income measure. Currently this is disposable income, measured after such taxes have been deducted.
- 11.6. While we accept that there may be arguments for including direct taxes, we believe that on balance they should be excluded from the main HCIs. They could potentially be included, if thought appropriate, in a subsidiary index, analogous to the former Tax and Price Index.

12. PENSION FUND CONTRIBUTIONS

- 12.1. Saving for retirement is something every person of working age has to consider. The state pension in the UK is not large compared with many other advanced countries and thus for many people a private pension, or some alternative funding, is needed. Indeed this was recognised explicitly a few years ago through the government making it compulsory for employers to offer a workplace pension scheme, with certain minimum contributions from both employer and employee, to any employee below pensionable age earning above a certain threshold (as of mid-2022 this was £6,240 p.a. or the

²³ See, for example, Paul Johnson, [UK Consumer price statistics: a review](#) (Recommendation 22) and the [RPIAC, first 1993 report](#) Cmnd 2142

equivalent monthly or weekly pay). Employers are obliged to enrol automatically all employees earning above a second threshold (2022 level £10,000 per year or equivalent) although the employee can subsequently withdraw if they wish. In most schemes both employers and employees contribute although some companies will cover all or part of the employee's share.

- 12.2. Should employee contributions be included in the HCIs? One argument against this is that this is a financial transaction aimed at financing future consumption and HCIs should be concerned with current expenditure. Against this, it can be argued that pension contributions are an essential expenditure for all but the most wealthy. It must also be recognised that there are analogies with National Insurance payments contributing to which is essential to be able to draw the state pension. (However, we are not proposing that National Insurance contributions should be included in the main HCIs.)
- 12.3. There are practical difficulties as well. How do you define, and thus value, one "unit" of future pension? Company schemes vary. In particular a number are still "defined benefit" where the ultimate pension is linked to the employee's salary, either the "final salary" or a "career average". Others are "defined contribution" where pensions are effectively paid into an investment fund from which the employee is able, on retirement, to provide a retirement income, for example, through the purchase of an annuity.
- 12.4. Overall therefore we feel that both the conceptual and practical problems of including pension fund contributions are too great to consider, at least at the moment.

SECTION C- OTHER ISSUES AND POTENTIAL USES

13. FREQUENCY OF PUBLICATION

- 13.1. The experimental HCIs have been published on an annual basis (excluding a COVID year). Most CPIs (not only in the UK) are published monthly. This is essentially because they are regarded as such important current economic indicators as to be necessarily available each month, and can thus be compared not only with the previous month but also the same month a year earlier. CPI, CPIH and RPI are all published monthly, and we would expect the HCI to be similar once it is fully, or nearly fully, developed.
- 13.2. The question would then remain as to the frequency of the subgroups of HCI – the various household groups such as pensioners. Many of these would also need to be published monthly – any used for uprating, for example, or those for low vs high income households. Quarterly publication might suffice for some.
- 13.3. We note that the President of the Royal Statistical Society wrote in April 2022 to the National Statistician urging more frequent publication²⁴.
- 13.4. It has for some time been the ONS's intention to publish HCIs quarterly once they had achieved National Statistic status. In 2022, with surging inflation provoking greater interest in inflation indices (and also partly as a result of the RSS President's letter), a decision was made to bring forward quarterly publication to 2023, once HCI production had been transferred to the ONS main production software platform. We clearly welcome this while trusting that this will be the precursor to monthly publication as soon as possible.

14. ELEMENTARY AGGREGATE FORMULAE

- 14.1. Currently the mathematical formulae used in the HCI are identical to those used in the CPI and the CPIH. (When scanner and webscraped data are introduced over the course of the next few years different formulae will be used for those but the current formulae will still be needed for data collected with more traditional methods.) That is to say a Lowe (Laspeyres type – i.e. base weighted) index is used when weights are available. When weights are not available – which is the case for around two thirds (in CPI) of items at the initial aggregation stage at which price quotes are combined into basic-level or elementary indices – a different formula has to be used. The choice of this formula was at the root of the issues with the RPI that led to its National Statistic status

²⁴ https://rss.org.uk/RSS/media/File-library/Policy/2022/220412_Sylvia_Richardson_to_Sir_Ian_Diamond.pdf?ext=.pdf and https://rss.org.uk/RSS/media/File-library/Policy/2022/Letter_from_Prof-Sir_Ian_Diamond_to_Prof-Sylvia_Richardson_050522.pdf?ext=.pdf for the National Statistician's response.

being removed. The whole issue of “elementary aggregate” formulae has been and remains highly contentious worldwide.

- 14.2. Three “elementary” formulae are used in the UK currently. The RPI uses the two arithmetic ones: the Dutot, or “ratio of averages” where the sum of prices of a particular item collected for the current period is divided by the sum of prices for the base period, and the Carli, or “average of relatives”. In the latter case the current period price for every item is divided by its base period price to give the “price relative” and then the mean value of the price relatives is calculated.²⁵ The third index, the Jevons, uses geometric means in which n items are multiplied together and the n th root of the result is taken. It makes no difference whether this is calculated as the average of the price relatives, or as a “ratio of averages”; mathematically the result is identical.
- 14.3. It can be shown that the Carli will always give a higher (equal at the extreme) rate of inflation than Jevons. The Dutot will sometimes give a higher rate and sometimes lower depending on circumstances.
- 14.4. CPI and CPIH use the Jevons index almost exclusively when weights are not available for certain products. Dutot is used in a very small number of cases. Both Dutot and Jevons are permitted formulae for the HICP in EU member states, while Carli is only permitted under certain specific circumstances. The use of Carli in consumer price indices has generally fallen out of favour in statistical institutes worldwide for a number of reasons, although arguments have also been made in its favour.
- 14.5. The decision to use the same formulae in the HCIs as CPI and CPIH initially was to facilitate comparisons with those indices while the HCIs were being developed. It makes the impact of the various differences in coverage clear and thus aids development. But should that be the final choice of indices?
- 14.6. We do not intend in this paper to discuss the pros and cons of the different formulae at length. We rule out Carli partly due to its general lack of acceptability internationally; more important, empirical experience shows that under certain circumstances, particularly when prices in the base period are very variable, it can badly overestimate²⁶ (as has been the case with UK clothing since 2010). We would though argue for more use of Dutot.
- 14.7. There is one set of circumstances where Dutot is not advisable. That is when the price levels of different items in a group are very different since the resulting index would be overly influenced by those with higher prices. Otherwise it seems to us to have two clear advantages. First it is simple and straightforward – to many it will seem the

²⁵ Note that this is the version of the Carli index used in the UK. There is another version, the “chained” Carli, in which price relatives are calculated as the price in the current period divided by the immediately preceding period so that the “base” period moves as the index develops. This form has the serious disadvantage that if the price of an item were to increase from period 0 to period 1 and then revert to its original price in period 2, the index for period 2 would be greater than that for period 0. Sadly many people confuse the two versions and assume that the version used in the UK has this fault.

²⁶ A seminal paper on the [empirical experience of different indices](#) was given by Bohdan Schultz (or Szulc) of Statistics Canada back in 1994.

intuitive way to calculate an index. There is always a good argument for simplicity when possible. The second reason – and linked to this – is public credibility. It is easy to explain.

- 14.8. As mentioned earlier, we do consider public credibility crucial. Public credibility is not often cited as an argument in this area recently but, if public confidence is considered to be of any importance, it should be. And indeed it used to be. Several Retail Prices Index Advisory Committee (RPIAC) reports mentioned it, for example this paragraph from the 1986 report²⁷:

“Underlying much of our reasoning in this report is the firmly-held view that it is important to sustain and promote public confidence in the RPI. For the index to be of value it must be generally regarded as relevant to people’s concerns and a fair reflection of their experience. This is partly a question of presentation - ensuring that results are readily accessible and understood – but it also concerns the methods of compilation. For the index to carry conviction these should be understandable and seem reasonable to “the man in the street” as well as to professional analysts or academic experts. Therefore, while we have consciously sought to clarify the concepts and principles underlying the index in a way which is intellectually rigorous, we attach equal importance to the simple test of public acceptability.”

- 14.9. Jevons cannot easily be used when a price can change to or from zero (car parking is an example) but is otherwise favoured by many statisticians and economists for its mathematical properties. Originally, it was little used due to the lack of necessary computing power to compute geometric means. We see two arguments against its use. First, as a geometric mean it is slightly more complex and more difficult to explain to the general public. Second, Jevons has the property that it implicitly assumes a certain amount of substitution by consumers towards items which rise less in price (or fall more). Politicians and others in the past cited this as an argument in its favour, not just in the UK but in other countries, notably in the US “Boskin” Report²⁸. While at times consumers will act in this way, overall consumer behaviour is too complex to be represented by a simplistic model. Implicitly also the use of Jevons implies substitution not only when consumers could easily change to those items with a lower price rise – such as when internet shopping or when differently priced products are in the same supermarket – but also when items are in different supermarkets or even in different areas so switching is less, or often not, possible. Further, and particularly at times of higher inflation, such switching may occur not because consumers find the new products equally satisfactory but because they can no longer afford the preferred product so the switch is a decline in welfare. In the UK an ONS paper²⁹ was among the research finally putting paid to this argument as an advantage for Jevons.

²⁷ [RPIAC report, 1986](#), Cmnd 9848

²⁸ Boskin, M.J.et al. “[Towards a more accurate measure of the cost of living](#)” (1996) *Prt104-72.pdf* ([senate.gov](#))

²⁹ [Elementary aggregate indices and lower-level substitution bias](#), Winton, O’Neill and Elliott, 2012. See also CPAC papers for the April 2012 meeting.

- 14.10. We are not saying that Jevons should never be used. No formula is perfect for all situations and different formulae will suit the price behaviour of different products better. We accept also that Jevons has useful mathematical properties. We are arguing that at some point in the future the choice of formula should be revisited and greater use made of Dutot. Our original paper suggested using the same formulae as in the now discontinued RPIJ, a mix of Dutot and Jevons, as a starting point.
- 14.11. In particular we would like to see better empirical assessment of the performance of different indices including their sensitivity to outliers whether this is in the base period or current period. The choice of formulae should, we believe, depend on the characteristics of the dataset being measured. We are dubious about the extent of the current reliance on the various axioms that have been put forward since there can be legitimate debate about the value of each axiom. And we would hope also that there are empirical assessments of the more complex formulae needed for scanner and other big datasets.

15. WHAT SHOULD THE INDEX BE CALLED?

- 15.1. The original 2015 paper proposed “Household Inflation Index” (HII) as the name of the proposed new index. When the ONS began to prepare for its new index based on the ideas in the 2015 paper, it felt that an “inflation index” was not appropriate since inflation is the change in the level of prices and the index is an index of price levels. It chose to use “Household Costs Index” as the name.
- 15.2. While we consider the use of “Household” to be an essential feature of the name, because it clearly demonstrates its difference from a “macroeconomic” index such as the CPI, we have never been happy with the word “Costs”. This is for three basic reasons.
- a) The general public, and the press, consistently use the word “inflation” to describe the process of rising prices. Unfortunately the very word “inflation” has never been satisfactorily defined, but most users recognise its general meaning. In contrast when talking about “Household Costs Indices”, the phrase always needs to be explained.
 - b) Second, we have a problem with the word “costs”. A “cost” says nothing about a “price”. If I fill my car fuel tank there are two financial aspects to consider. First, the price (per litre) of the fuel. This is the item which may suffer from inflation. Then there is the size of the fuel tank, which, if filled, determines the maximum quantity of fuel purchased. This is the price per litre multiplied by the quantity of fuel purchased. This is in fact the “cost” of the fuel: it has no direct link with the “price” of the fuel.

- c) A third issue is that keeping “cost” in the title could lead to misunderstandings among experts who might consider that it should be based on methods appropriate to a COLI (see box at end of Chapter 1).

15.3. Although the experimental HCIs have now been published over a 4-year period, they are indeed experimental and not yet used by the public or indeed the government or ONS. It should not therefore be a problem, in our view, either to return to our original name of Household Inflation Index at this stage of development or to seek another name. Any suggestions?

16. SOME CHANGES FOR THE LONGER TERM

- 16.1. There are two developments we, and many other people, would like to see eventually but where current data are not sufficient to provide estimates of adequate statistical quality. The first is a breakdown by geographical area - notably by region. This is generally accepted as an important need for CPI and CPIH (and indeed RPI) as well. At the moment data limitations prevent this. In 2022 the ONS started some experimental research for Northern Ireland but this was only possible with a boost to the data normally collected³⁰. The advent of scanner data should eventually help to make this possible.
- 16.2. There is, however, a further area where more serious research and additional data gathering is required and this is more important for HCIs than for macroeconomic indices. At the moment ONS is able to provide weights for the different household groups for each category and sub-category of expenditure. But the implicit assumption is made that all households buy similar products within each sub-category.
- 16.3. The issue with this was highlighted in early 2022 by the campaigner Jack Monroe arguing that cheaper brands were going up faster in price or disappearing from supermarket shelves making the effective inflation rate higher for lower income households. This argument gained considerable traction. ONS in response started an experimental collection of a limited number of low-cost versions of basic products³¹. While this found little difference between price movements in low-cost items overall and items generally this was a limited collection and purely experimental. A key point is that while margins for branding etc give potential for discounts on higher value items there is less potential for supermarkets and retailers to offer discounts on low-cost items.
- 16.4. This was only intended as a first step. Clearly it is important to pursue this line of investigation so we have a better understanding of the types of products different household groups tend to buy. While most attention has focused on the experience of low income households there are other groups where this could be important – are there, for example, differences between the types of product pensioners buy compared

³⁰ [Boosting the Northern Ireland price sample for the Consumer Prices Index - Office for National Statistics](#)

³¹ [Tracking the price of the lowest-cost grocery items](#), ONS, May 2022.

with those of working age that are not a reflection of different incomes? Coupled with this will be research to gain a greater understanding of where and how different households tend to shop, how constraints such as accessibility affect inflation experience and so forth.

16.5. We suspect - and hope - this will be a major line of inquiry in the future.

17. QUALITY CHANGE

17.1. We begin with a definition of “quality change”. It is perhaps an unhelpful word to use since the notion of quality is essentially personal: one consumer’s quality increase is another’s quality decline. In practice the issue is one of changes in specification. That is a more scientific term, capable of clear definition. But we are not proposing a change for now.

17.2. An issue for a price statistician is what to do when a product in the sample list changes or is replaced. If the new product is deemed to be an identical (or almost identical) replacement of the old there is no problem; it can simply replace it in the price collection system. It becomes more difficult if the new product is deemed significantly different in some way. A linking method³² is then used to eliminate the impact of the difference. This effectively eliminates (or partially eliminates if the linking is only in part) any price difference.

17.3. Frequently this situation occurs when it is deemed that the change in price is due to a change in quality. For a macroeconomic index it is logical that price rises due purely to a change in quality should be adjusted so that the index reflects, as far as practical, an index of “constant quality” price change. Quality changes in practice may also be negative. There are, however, a number of issues. Often such a price change is a mixture of an actual price rise and quality change – deciding how much is due to each factor is a matter of judgement. The report by Paul Johnson³³ considered this and recommended (although it was not one of his numbered recommendations) further research. The example shown in his report, of vacuum cleaners, led many to wonder if quality adjustments had been overdone.

17.4. The definition of what constitutes a quality improvement or specification change is not always easy either, especially when it involves services rather than goods. For example, a change in the material used in an item of clothing may be regarded by some as an improvement, and by others as a reduction in quality. It is certainly a change in specification and should not be ignored in compiling the price index. A much more straightforward example would be the reduction in size of a packet, be it soap powder or

³² See, for example, Chapter 9 in Astin, *Measuring EU Inflation: the Foundations of the HICP*, Palgrave Macmillan, 2021. E-book also available. [Measuring EU Inflation | SpringerLink](#)

³³ Johnson, P. “[UK consumer price statistics: a review](#)” (UK Statistics Authority)

chocolate. Here the solution is simple: measure the price in terms of the weight. As regards services there is often no specific measurement available, be it a change in a bus timetable or the time taken for a repair to be completed. Is the switch to more self-service for items such as holiday bookings an improvement, as the customer can do it all online from their own home at a time of their choice, or a deterioration in that they have to do all the research themselves?

17.5. Overall, however, difficult as it may be, it is logical that a macroeconomic index should attempt to measure price change at constant quality. But it is not always evident that the same holds true for HCIs. Consider the case where it is no longer possible, or easy, to buy an “unimproved” version of a product. One example is cars. Rightly, one can no longer buy a car with the safety standards of 20 or 30 years ago. Cars today are much safer than in earlier times (the decline in serious road accidents being partly a consequence of this). But the incorporation of such standards will, in many cases, have resulted in a price rise, either explicit or hidden, or the prevention of a price fall. The switch from analogue to digital television a few years ago is another example. In these cases there could be a case for not removing the quality improvement from HCIs since the household has to pay the extra amount whether or not it wants the improvement.

17.6. This issue is, of course, tangled up with the changes in the basket over time. And with the fact that technology can introduce new products so that the way we do things can change substantially over time. Astin (1998)³⁴, for example, looked at how the way we listen to music at home has changed substantially over decades.

17.7. All of these are complex questions. When we wrote our 2015 paper it was not long after the Johnson review had indicated the need for more research. We therefore suggested that this issue should be reviewed again after the research had been done. To the best of our knowledge this has not happened so we can only repeat the need for further consideration of the issue.

18. POTENTIAL USES OF HCIs

18.1. Consumer price indices are used for a variety of purposes. The 2015 Review of Consumer Prices by Paul Johnson listed five:

- i) For the setting of interest rates through inflation targeting.
- ii) As a compensation index, for increasing payments to compensate the recipient for increasing costs.

³⁴ “[Quality Adjustment in CPIs: A Personal View](http://www.ottawagroup.org)” Ottawa Group, 1998, Washington DC, www.ottawagroup.org

iii) As a deflator to express other financial data (such as earnings or economic output) in real terms.

iv) To make comparisons between inflation in the UK and in other countries. –

v) To inform the public as to the changes in costs they face.

Comparing with earlier lists, for example that in the 1986 RPIAC report, Johnson's list has one clear omission so we could add:

vi) To enable government and researchers to assess changes in the standard of living of consumers, including the purchasing power of household incomes.

18.2. A macroeconomic index such as CPI or CPIH is clearly the one to use for i). Since the CPI is the EU HICP for the UK it is clearly the index to use for iv). In contrast v) and vi) fit clearly into the purpose of the HCI.

18.3. Which is the better index for ii) and iii) depends on what is being deflated and which compensation payment is being uprated. Looking first at deflation, a macroeconomic series is clearly better at deflating national accounts. In contrast there would often be a case for using a household index to deflate earnings.

18.4. This leaves the use of the HCI, or HCIs, as a compensation or uprating index. Both CPI and RPI, and occasionally CPIH, are used to uprate an extensive range of items ranging from pensions to rail fares to student loan repayments to index-linked bonds. Sometimes the index is not used directly but to inform debate or discussion – for example when negotiating wages or salaries. We now discuss this use in some detail.

The potential use of HCIs in uprating

18.5. As mentioned earlier, when we originally wrote our paper in 2015 we envisaged an index that could be used primarily as an uprating index. It has become clear since that the main aim of the indices should be to reflect the inflation pressures on households whether this is households as a whole or groups of households. But does this prevent its potential use as an uprating index once it has been fully developed? By no means – indeed for many purposes an HCI, either the overall index or a sub-index, would be ideal.

18.6. The choice of an uprating index logically depends on the purpose. A whole range of different indices can be and are used in contracts. For example, indices of construction costs can be used in real estate. For certain other purposes CPI or CPIH would serve. Sometimes, however, there is an express need to uprate in line with inflation as it affects households, or to use such a measure as a base line. Examples are pensions, benefits, wage negotiations and tax brackets (when these are not frozen).

18.7. HCIs - either the headline index or that for a specific household group - would be the natural choice of a reference index in such cases whether the need is either to directly link to them or to use them as a reference. Wage negotiations is an area where they could be used as a reference or starting point. Wages rise somewhat faster than prices over the long term as productivity improvements enable a general slowly rising standard

of living; conversely in some years financial or business problems might limit employers' ability to increase wages sufficiently to offset fully the increase in prices inflation. In either case, however, the Household Cost Indices would provide a starting point for negotiation.

- 18.8. Pensions are often linked to a specific index and here HCIs could play a role. Pensioners have different spending patterns to those of working age and spending characteristics also change with age. A 2022 briefing note by the Pensions Policy Institute³⁵ examined spending patterns and the impact of recent inflation on pensioners and suggested that pensioner specific indices, possibly from HCIs, might provide a better way of uprating pensions.
- 18.9. Benefits could be uprated with reference to either a specially constructed HCI or possibly that for the lowest income decile. There is a precedent for having a special index for uprating benefits in that the Rossi Index, a version of the RPI excluding housing costs, was used for this purpose between 1983 and 2011. It was discontinued in 2017.
- 18.10. In many years tax brackets are changed (or frozen) for policy reasons. In other years they are uprated in line with inflation. Since the aim of this is to keep the tax burden neutral with respect to the impact of inflation on households, an HCI would seem the appropriate index.
- 18.11. Two arguments have been advanced against using HCIs for uprating. One is that adding another series to the mix would increase confusion and increase the chance of unjustified "index rate shopping". We accept this is a real argument – how can it not be when the most prominent offender for the latter appears to be government itself due to its use of both CPI and RPI? Meanwhile the ability of pension funds to change uprating from RPI to CPI has in practice, as tested by a number of court cases, depended on the precise wording of the fund deeds, something normally drawn up way before the issues with RPI became apparent.
- 18.12. However, the confusion and potential for unjustified "shopping" arises from two sources. The first is what has happened to the RPI. The second is from the government using an index – CPI – that, as the EU's HICP, was not intended for use as uprating but, to quote the preamble to the regulation governing its introduction, for "*providing comparisons of inflation in the macro-economic and international context as distinct from indices for national and micro-economic purposes*".³⁶ We do not see either of these as an argument for not using HCIs. What is needed is good practice in selecting an index and public justification for its choice.
- 18.13. The second issue affecting the use of an HCI for uprating would come about if, as we hope, mortgage capital costs and deposits for first time buyers are included in the main index. The argument here is that those with a mortgage would effectively be rewarded

³⁵ [How do Cost-of-living increases affect pensioners?](#) PPI Briefing Note Number 129, March 2022. See also Briefing Note Number 133 [How does high inflation impact pension schemes and their members and how might inflation change in the future?](#)

³⁶ [Council Regulation \(EC\) no 2494/95](#) of 23 October 1995 concerning harmonized indices of consumer prices.

for buying an asset which will also increase their wealth. We do not entirely accept this since, as argued, the time for realisation of such wealth normally comes a long time after the original investment and shelter is one of the most basic necessities. However, if this is felt to be an issue, this could simply be addressed by using an index excluding the capital costs element.

18.14. Overall, however, we would argue that there are clear potential uses for HCIs and a number of purposes they would serve better than macroeconomic indices. This leads to our conclusion that they should not be seen as just an “add-on” or an interesting sideshow. They have a clear purpose, or purposes, and, we argue, need to take their place alongside other key economic and social indicators.

APPENDIX A – ADDITIONAL DETAILS ON OWNER OCCUPIED HOUSING

Treatment of Owner Occupied Housing in UK price indices

A1 We first look at how owner occupation has been treated in the past in the UK and then examine more recent data compiled by the ONS to compare three different methods.

A2 **RPI.** Initially the RPI used rental equivalence – in the 1950s owner occupation was much less common than now. Following the rapid growth in owner occupation during the 1950s and 1960s, the Retail Prices Index Advisory Committee (RPIAC) decided in 1975 to switch from rental equivalence to mortgage interest payments, their report³⁷ stating:

“Owner-occupiers' other costs are at present treated by taking them as the "equivalent rent" which the house would fetch if let in a free market, and assuming, in effect, that these "equivalent rents" move in parallel with the observed rents of local authority houses and privately rented houses. We recommend that, instead of using an "equivalent rent", owner-occupiers' costs (other than repairs and maintenance, etc.) should be represented in the index by the cost of mortgage interest payments.”

A3 The mortgage interest payments households pay in period t depends in part on the price paid for their dwelling which could have been purchased many years earlier. In addition, if they have the most common form of mortgage where payments are a combination of interest and loan repayment and the amount paid is evenly spread over the mortgage period, then payments near the beginning of the mortgage will be largely interest. As time progresses the proportion of the payment accounted for by interest will decline and that which is capital repayment will increase. To account for these two factors a complex calculation is used to model the interest payments paid.

A4 Later, in 1992-94, the RPIAC decided³⁸ to include an additional component representing housing depreciation in the RPI. This used an index of house prices as its indicator.

A5 This was a difficult decision on which the Committee was not unanimous. It is clear, though, from reading the Committee's report, that the different purposes the RPI was then used for – and in particular its use as both a way of uprating incomes and prices and as a macroeconomic indicator – bedevilled the discussion. The outcome – to use mortgage interest plus an estimate of depreciation proxied by house prices – was a compromise from which four members dissented.

A6 **CPI and Owner Occupier Costs in the HICP.** The CPI, which is the EU HICP for the UK, does not (at least currently) include Owner Occupier Housing costs.

A7 Discussions on how to cover OOH costs in the HICP were held on many occasions in Eurostat in the late 1990s. At an early stage the method of imputation of rental values was dismissed, although several member states used this method in their national CPI. It was however vetoed by the European Monetary Institute (the forerunner of the European Central Bank). A decision

³⁷ [RPIAC 1975](#) Cmnd 5905

³⁸ [RPIAC 1994](#) 2nd report, Cmnd 2717

was finally made to include the “net acquisition” of dwellings. The term “net” covered the purchase of dwellings new to the household sector, e.g. purchased from companies or local government. Plus, of course, newly built dwellings sold directly to households. Dwellings sold from one household to another would not be included. In brief, the coverage would be “properties new to the household sector”.

A8 This method of course reflects the “macroeconomic” nature of the HICP: “household sector” rather than “households”. For a number of reasons the adoption of this method has still not been made, though it is covered in EU regulation 2020/1148 Art 25, in regard to the OOH price index, compiled separately from the HICP:

“The OOH price index shall be based on the ‘net acquisitions’ approach, which measures changes in prices paid by consumers for the acquisition of dwellings that are new to households and changes in other costs related to the ownership, and transfer of ownership, of dwellings.”

Net acquisitions is also used by Australia and New Zealand in their consumer price indices.

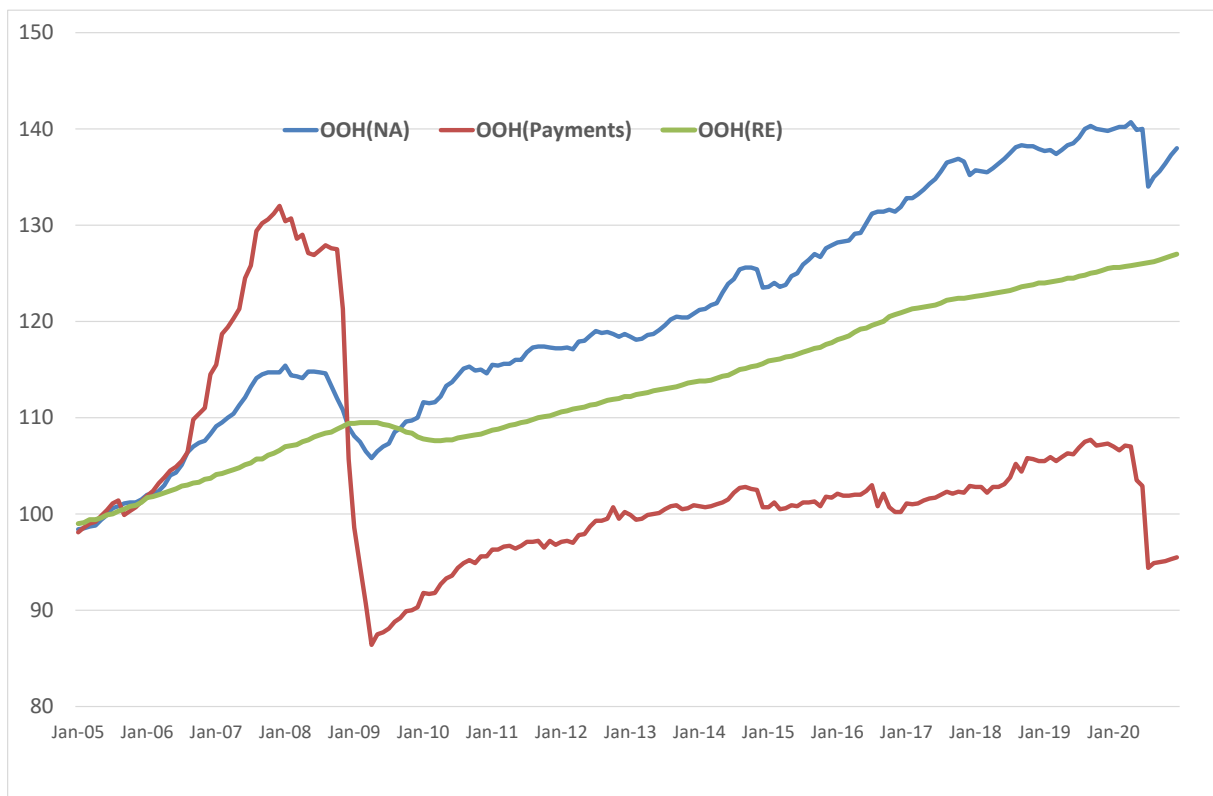
A9 **CPIH.** The reason for the establishment of CPIH was to enable a measure of Owner Occupier Housing to be included without having to wait for its eventual inclusion in the HICP/CPI. Thus one of the first jobs of the UK’s Consumer Prices Advisory Committee (CPAC), established in 2009 to replace the RPIAC (which had not met since 1994), was to consider how to add owner-occupier costs to the CPI, thus forming what became known as CPIH. It rejected the inclusion of mortgage interest payments due to the possible future use of the series in interest rate setting, and narrowed its deliberations to two options: rental equivalence and Eurostat’s net acquisitions approach.

A10 CPAC decided to recommend the rental equivalence method. This was a controversial decision and the subsequent consultation showed opinion was split between that and “net acquisitions”. Given that the CPI was a macroeconomic index and that CPAC, by rejecting mortgage interest payments (MIPs), had made it clear that macroeconomic and national accounting needs should have priority, either method was considered to have been broadly theoretically acceptable. Council tax was also included from 2017.

Potential different approaches to measuring Owner Occupier Costs in the UK

A11 Until 2021 the ONS published three different series of Owner Occupied Housing costs in the UK. This seems now to have been stopped but the chart below shows the last published data which ended in 2020. The chart below shows the series for net acquisitions (OOH(NA)), Rental equivalence (OOH(RE)) and the payments basis used currently in HCIs. At the moment the payments series includes mortgage interest rates and some other items such as repairs and maintenance, estate agents’ fees etc., but no capital costs. It is therefore dominated by mortgage interest which is currently modelled by the RPI method. There are two issues with this as explained below.

Chart 1: Three measures of OOH costs, 2005 to 2020; indices 2005 = 100



Source: ONS

A12 As would be expected the rental equivalence series is the smoothest. Net Acquisitions reflects the boom in house prices just before the 2008 financial crisis, their subsequent fall and then the rise in prices that followed until its interruption by the Covid pandemic. The payments series, due to the importance of mortgage interest payments and the use of the RPI method, is heavily influenced by the movement in interest rates around the time of the 2008 financial crisis. Following the crisis interest rates were slashed to very low levels.

A13 Internationally, various other methods have been suggested at various times³⁹.

Improving the measurement of mortgage interest

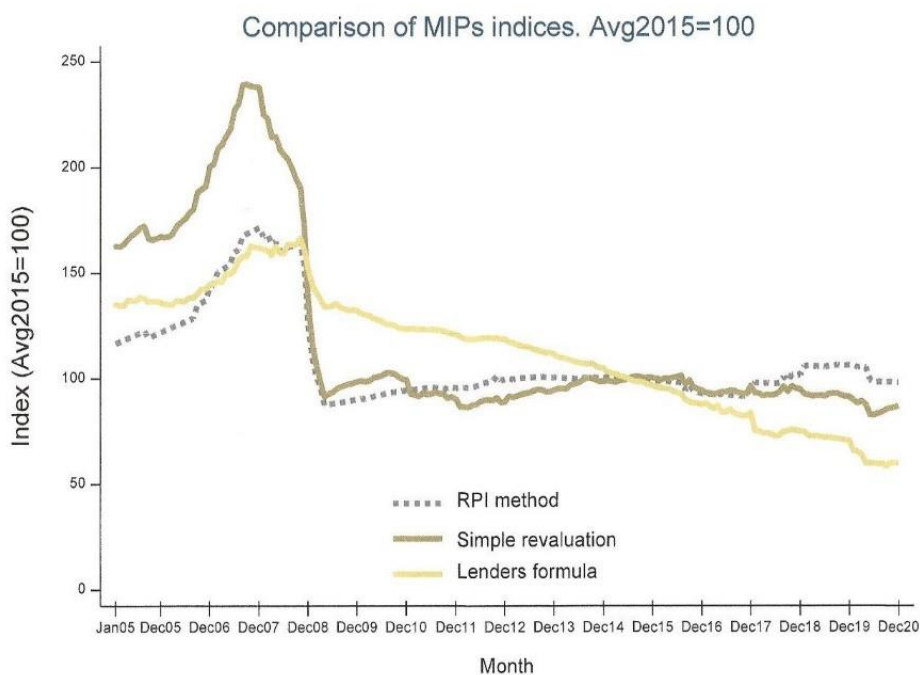
A14 The impact of the financial crisis, and developments before and after, is, however, exaggerated due to the way that mortgage interest rates were measured at the time. Before 2010 the headline variable rate was used which was heavily – often directly - influenced by changes in Bank of England base rate. In the past most people had mortgages using the variable rate. But by this century a majority of households had mortgages where interest was fixed for a small number of years so that the impact of a change in base rate came through only gradually and fluctuations could be dampened.

³⁹ The website for the Ottawa Group (www.ottawagroup.org), the International Working Group on Price Indices, lists a number of papers on the topic of Housing.

A15 From 2010 the use of the headline variable rate was replaced by the average effective rate, thus becoming more realistic.

A16 In addition to the interest rates used, the way that mortgage interest rates are modelled remains important. In 2021 the ONS investigated different ways of modelling these. The chart below shows two methods in addition to the RPI system. One is based on the model used by mortgage lenders. The second is the model used by New Zealand in their Household Living-Costs Price Indices where mortgage interest rates are simply weighted (multiplied) by house prices. The following chart shows the results. Note that the data ends in 2020 so excludes the recent rise in mortgage interest rates.

Chart 2: Different methods of calculating mortgage interest



Source: ONS

A17 The series based on the mortgage lenders' method shows, as would be expected, a fall in 2008 just after the financial crisis, but without the exaggerated fall shown by the RPI method. This is followed by a gradual steady decline as the impact of the very low interest rates (not just Bank base rate but also longer term rates) from 2008 to the beginning of the current decade influenced more and more mortgage interest payments. Clearly there are advantages in adopting the method used by mortgage lenders (there are one or two relatively minor technical issues with it which need to be addressed).

A18 The New Zealand method has the advantage of simplicity but since it only uses current period house prices shows even more exaggerated movements in the early part of the series.

Appendix B - SUMMARY OF TOPICS ALREADY INCLUDED IN HCI EXPERIMENTAL INDICES

B1 INTEREST PAYMENTS - 1st HCI Dec 2017 and 3rd HCI Jul 2020

In addition to mortgage interest payments, HCIs include interest payments on credit card debt, overdrafts and personal loans and loans associated with mail-order purchases.

Credit card interest was included in the 1st HCI. Interest on secured and unsecured personal loans, overdrafts, and mail-order purchases were included from the 3rd HCI.

B2 STUDENT LOANS AND FEES - 2nd HCI Apr 2019 and 3rd HCI Jul 2020

The cost of the repayment of student loans is included (both “capital” – the actual cost of the fees - and interest). Thus university fees are included only with a weight appropriate to the share of them that were paid up front. For the remainder, there are separate items in the index corresponding to interest on and repayments of student loans.

The 3rd HCI (Jul 2020) also included upfront payment of tuition fees.

B3 HOUSEHOLD-BASED WEIGHTS - 1st HCIs Dec 2017

Both the overall index and the sub-indices are produced as closely as practical with household based weighting.

B4 INSURANCE PREMIUMS - 1st HCIs Dec 2017

HCIs include insurance premiums at full weight (“gross/gross”).

B5 OWNER-OCCUPIED HOUSING - 1st HCIs Dec 2017

HCIs include mortgage interest payments, dwelling insurance, ground rent, Stamp Duty Land Tax, repairs and maintenance, conveyancing, estate agents’ fees, homebuyers’ surveys, other house purchasing costs and ground rent.

B6 PAYMENTS BASIS

Mortgage interest, interest payments and student loans all represent items collected on a payments basis. It should also be possible to use a payments basis for services items such as holidays and theatre tickets which are often paid for in advance.

Links to ONS HCI publications can be seen at [Search - Office for National Statistics \(ons.gov.uk\)](https://www.ons.gov.uk/search)

Appendix C - RPI/CPI USER GROUP STATEMENT (2014) ON AN UPGRATING OR HOUSEHOLD BUDGET INDEX

There is a clear need for a price index designed specifically to measure the increase in the costs of a household budget for the UK as a whole. The index would seek to measure, over both the long term and short term, how the cost of the appropriately weighted basket of goods and services, public and private, bought or paid for by the typical household had changed allowing for evolution in the contents of the basket due to product change and shifts in typical purchasing patterns. It would be based primarily on actual household expenditure at the time of payment. All items on which a household normally spends money should be in scope, weighted according to their share of the household budget, unless there are good and clear reasons to exclude them or to reduce their weight.

Among other criteria it should meet the requirement in the Social Security Administration Act 1992 of measuring the “increase in the general level of prices” or any subsequent replacement legislation. While the key need is for an index covering all UK households, the index should be capable of being calculated for different population groups where needs exist and resources permit.

The index would be designed with the following purposes in mind:

- The uprating of pensions, benefits and other items, where there is a legal or contractual requirement aimed at preserving the purchasing power of the individual or household;
- As an indicator in wage and other negotiations where the need to preserve the purchasing power of the employee is typically a factor taken into account;
- As a guide to uprating prices, elements of business contracts or other sums where it is logical, desirable or legally required to link these to household budget costs;
- In calculating the evolution of real incomes for households or individuals.

Appendix D - CHARTS OF HCIs

The following pages show charts of, first, the overall HCI vs CPI, CPIH and RPI and, second, HCIs broken down by the various household groupings ONS provides. With one exception we are showing the indices from 2005, the date from which HCIs are generally available, and annual growth rates from 2006. The one exception is the analysis of households with and without a disabled person which is only available from 2015. All charts show monthly data.

We are deliberately refraining from any comment except for the odd factual point.

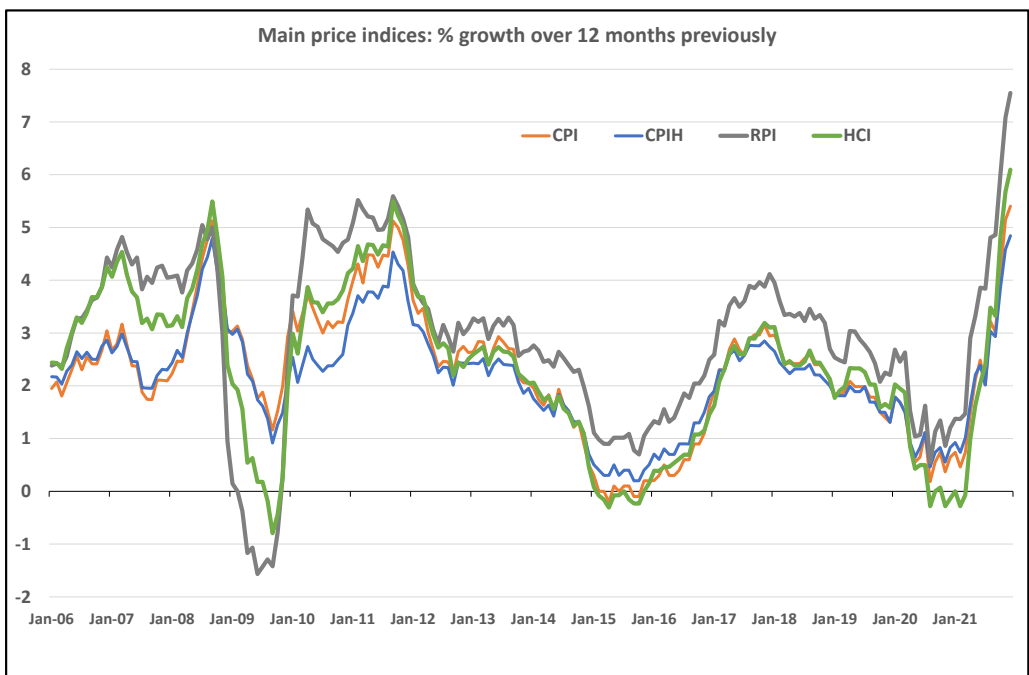
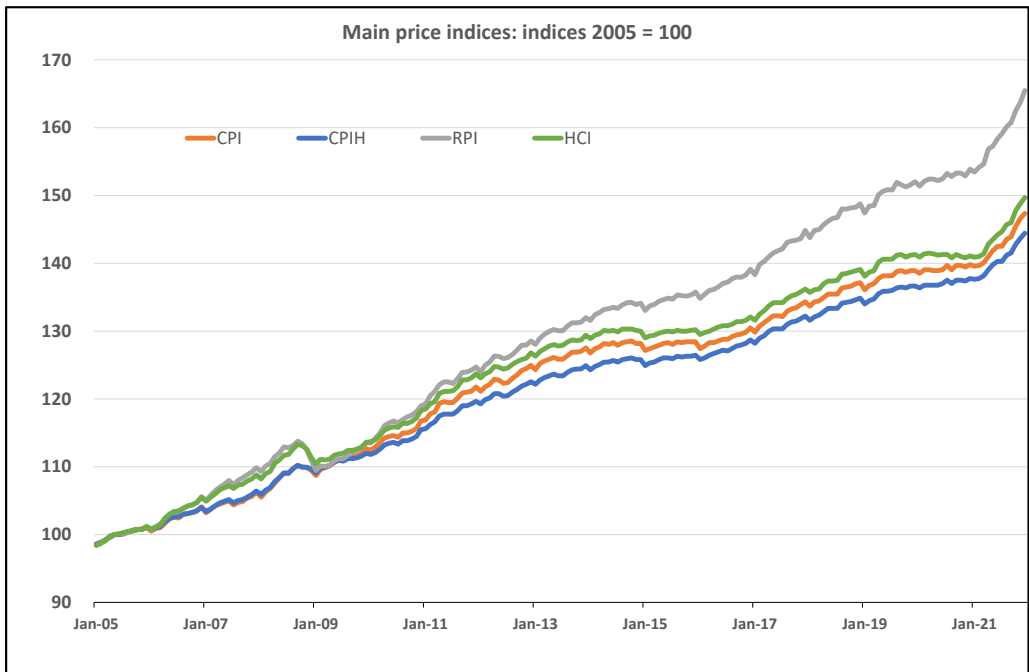
The differences between the various HCI series are due to the varying proportions of expenditure each group allocates, on average, to different categories of expenditure. The differences between the four total series are partly due to differences in coverage (mainly commented on in the text of this paper) and partly to other factors.

With one exception all these differences have (as far as we are aware) sometimes worked in one direction and sometimes in the opposite one as regards the inflation rate shown, although, importantly, there have been prolonged periods in which one factor has worked consistently or predominantly in one direction. The exception is the difference between the formulae used at the first stage of aggregation when weights are not available. In the RPI this is Dutot or Carli, in the other series it is predominantly Jevons (see chapter 14). The use of Carli works consistently to raise the RPI inflation rate compared to the other series. Before 2010 this made a difference of around half a percentage point annually. There were differences of opinion as to which formula was more appropriate.

Prior to 2010 there were problems with the measurement of clothing prices resulting in an underestimation of inflation, particularly in CPI. To correct this, changes were made to the collection of clothing prices in 2010. However, the interaction of these changes with the Carli formula caused the formula effect difference to widen to around one percentage point on average. Most people now accept that this has caused the RPI to overestimate inflation since 2010. Legal constraints have prevented this being corrected.

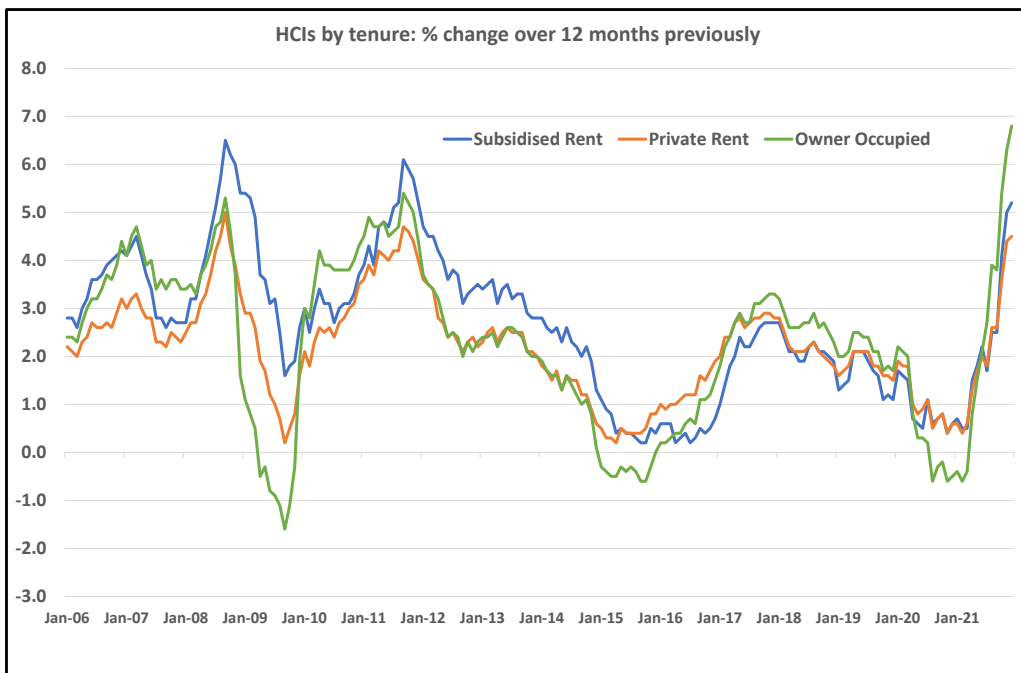
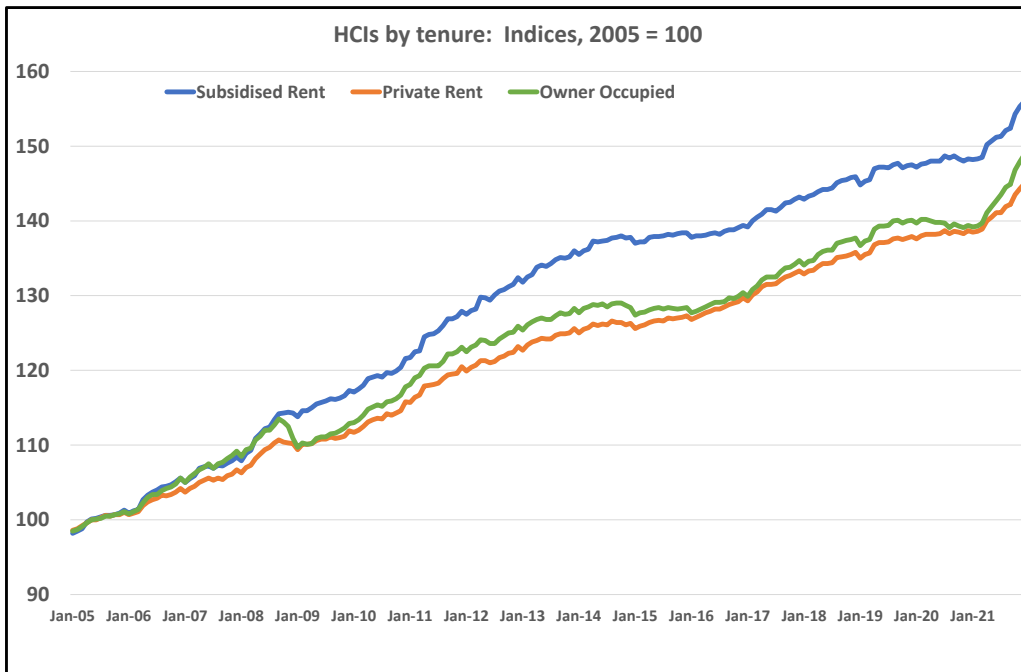
The ONS database from which the HCI series are taken is available at [All data related to Household Costs Indices, UK: fourth preliminary estimates, 2005 to 2021 - Office for National Statistics \(ons.gov.uk\)](https://ons.gov.uk/indices/articles/all-data-related-to-household-costs-indices-uk-fourth-preliminary-estimates-2005-to-2021). This also shows information on the expenditure shares of different categories of expenditure and their contribution to inflation enabling the reasons for the differences between the data for the different household groups to be explored further.

Charts 3 and 3a: CPI, CPIH, RPI and overall HCI



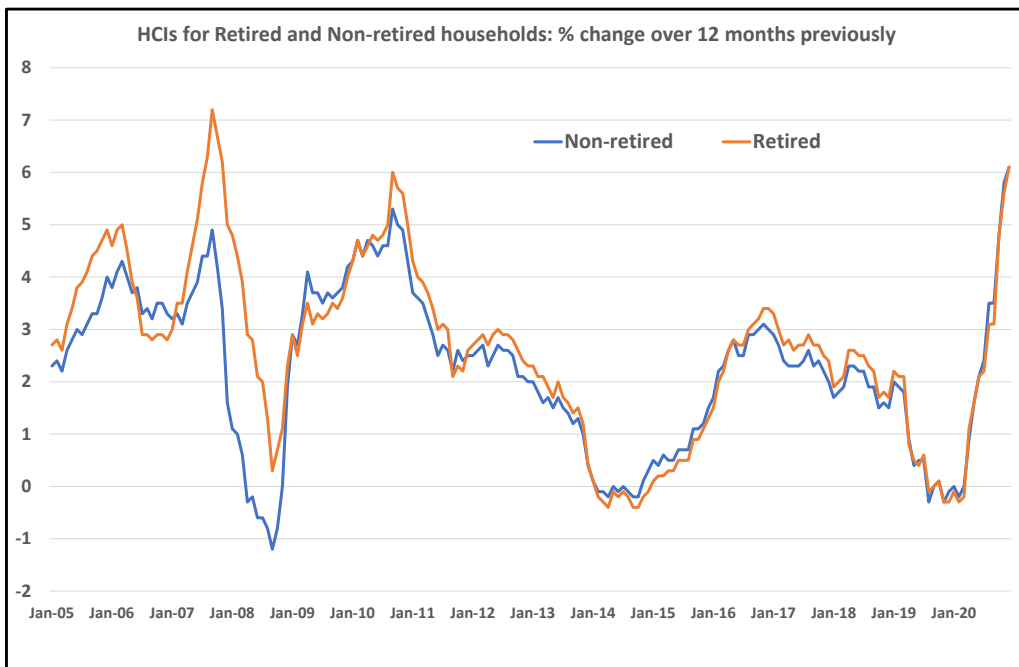
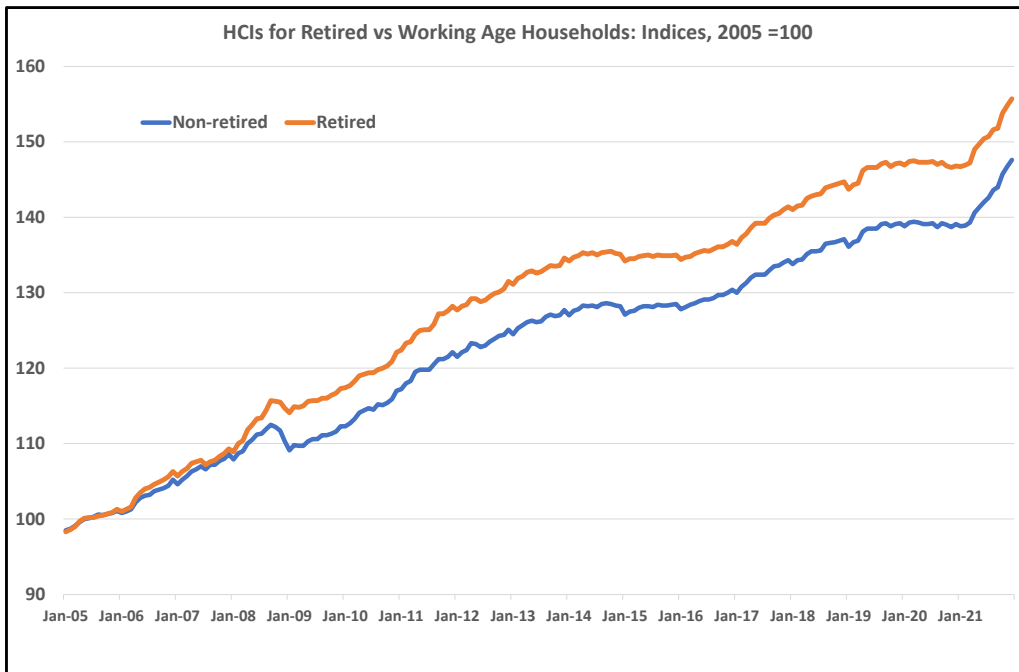
Source: ONS. Indices converted to 2005=100 by authors.

Charts 3 and 3a: HCIs by Housing Tenure



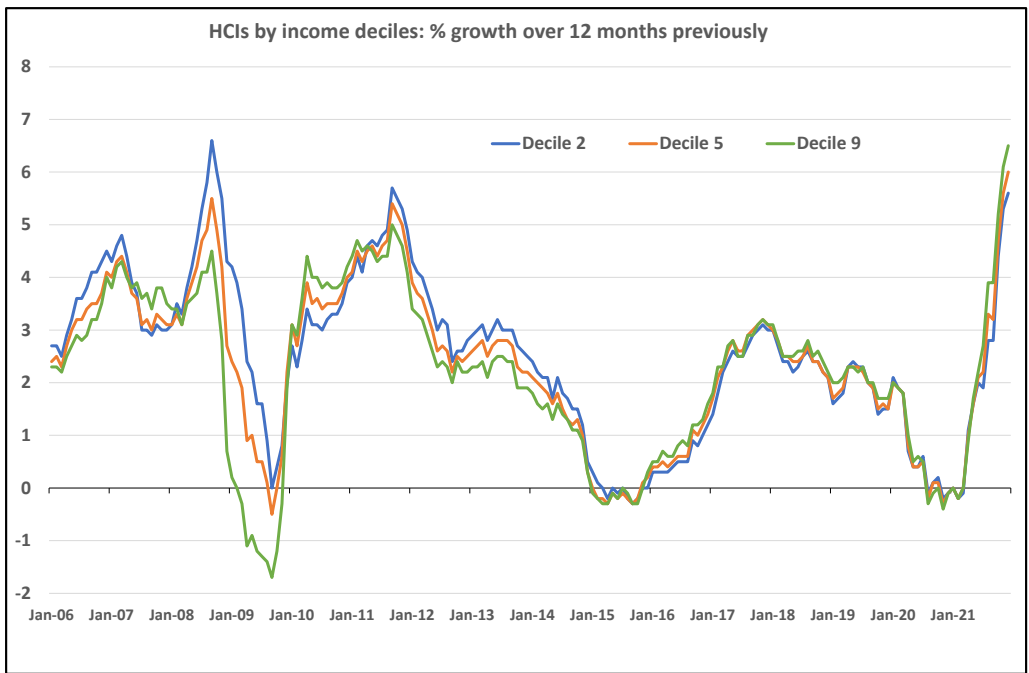
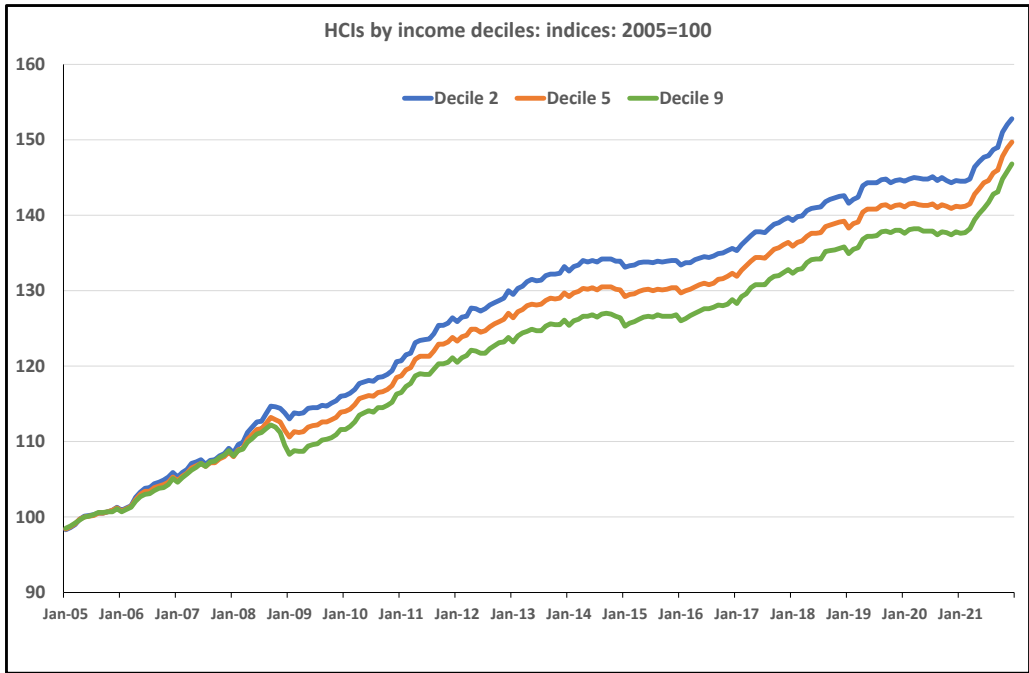
Source: ONS

Charts 5 and 5a: HCIs for Retired and Non-retired Households



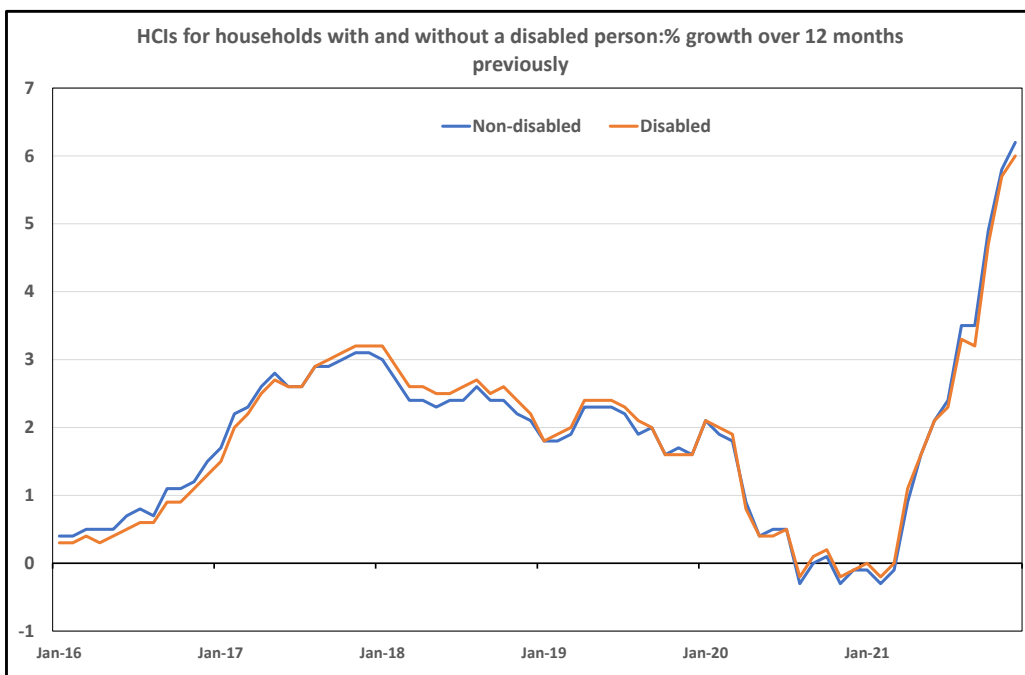
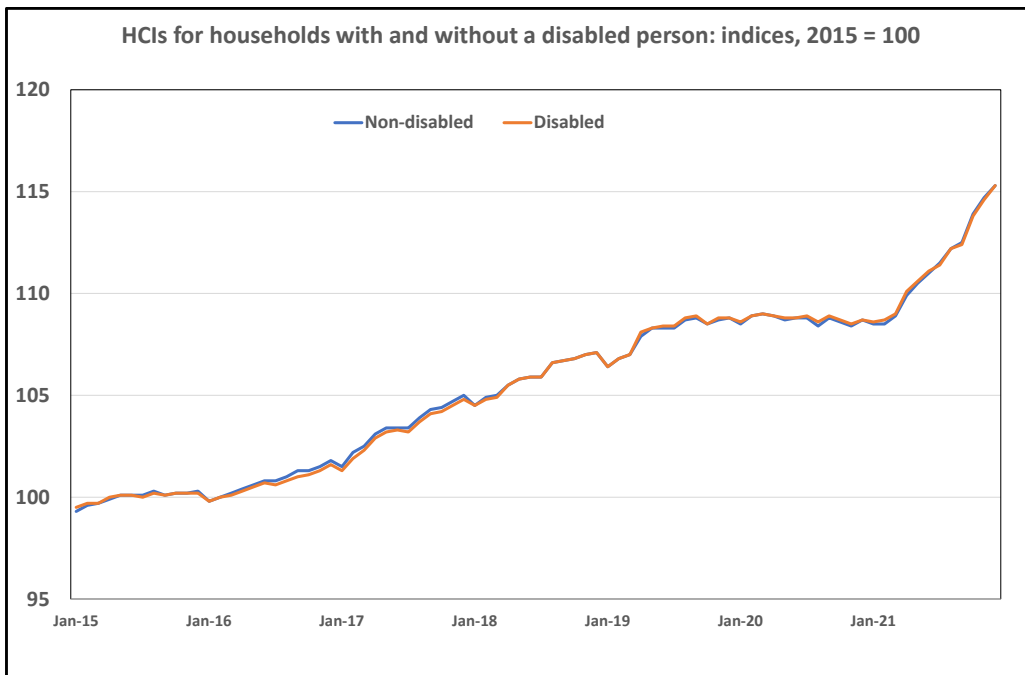
Source: ONS

Charts 6 and 6a: HCIs by Income Deciles (2nd, 5th and 9th deciles)



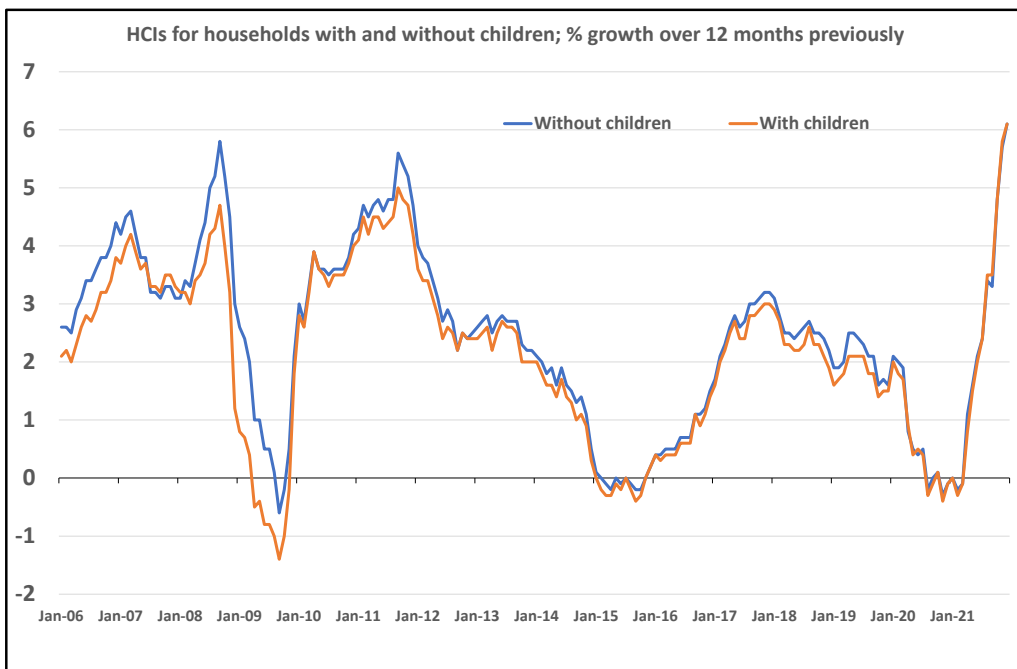
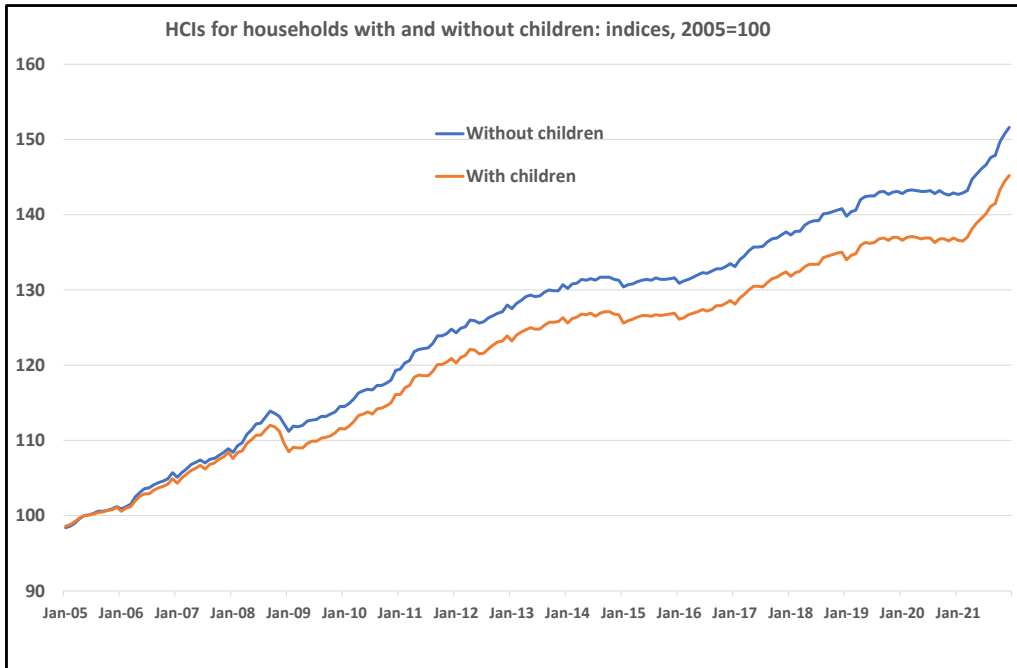
Source: ONS

Charts 7 and 7a: HCIs by households with and without a Disabled Person
 (These series are available from 2015 only)



Source: ONS

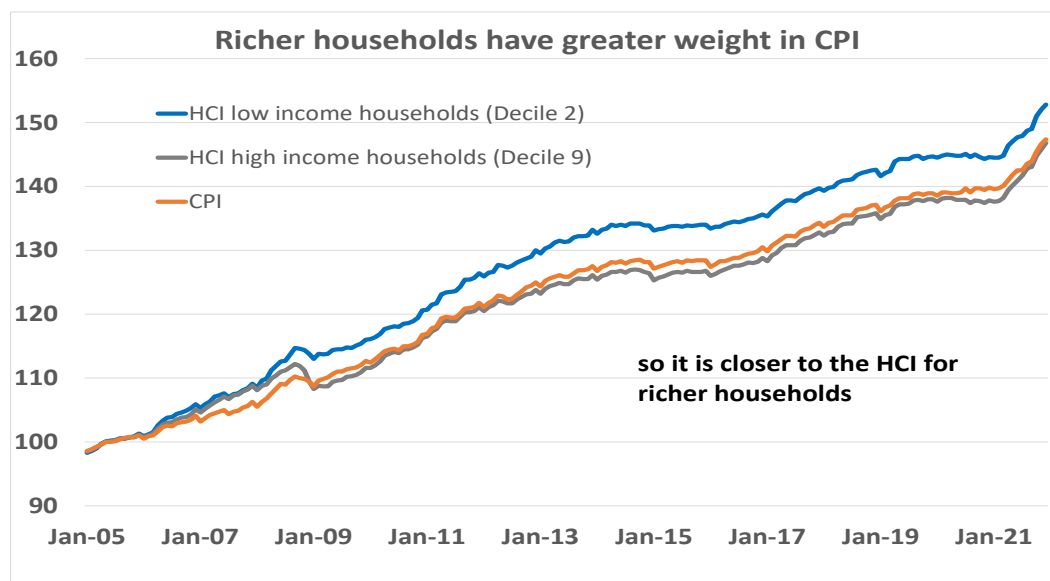
Charts 8 and 8a: HCIs by Households with and without Children



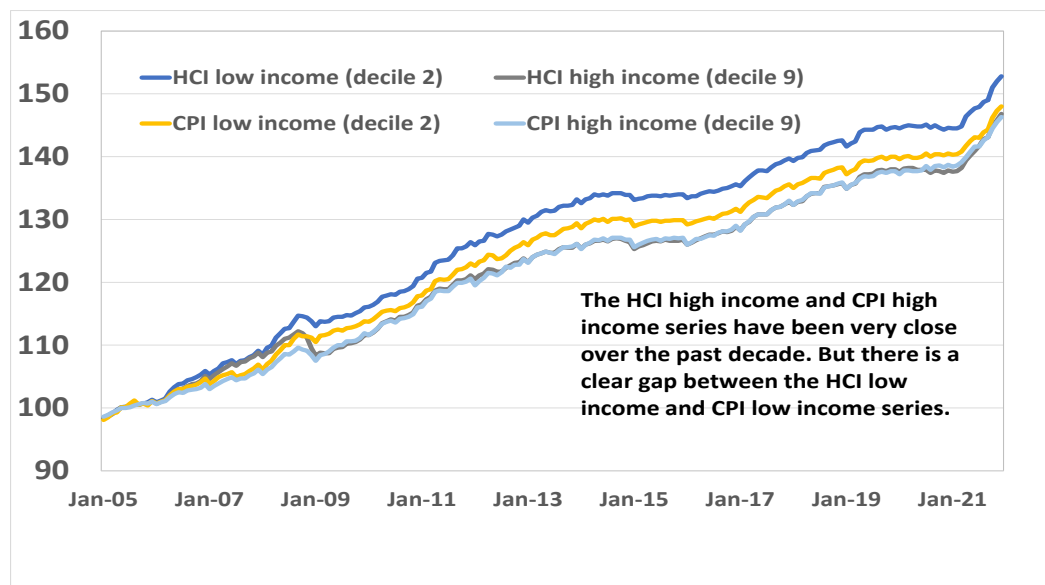
Source: ONS

Appendix E – Two charts presented at the “Better Statistics” meeting in May 2022

E1 The following two charts were presented to a meeting organised by “Better Statistics CIC” in May 2022. We feel they demonstrate one reason why HCIs are needed. The CPI has been close to the HCI for higher income households (here represented by decile 9) but, over the period shown, has underestimated inflation for lower-income households (represented by decile 2).



E2 Earlier in 2022, ONS also published a breakdown of CPI by income deciles. Like the HCIs these series are still experimental so only limited weight should be placed on them. But we find it striking that while the series for higher income households are so close as to be almost indistinguishable, there is a clear gap between the two series for lower income households. Obviously these are very provisional results so the usual caveats must apply.



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