

# Developing an Index of Household Payments

We have started to explore the concepts and feasibility of producing an index that measures changes to the cost of payments made by households. This paper aims to set out discussion points for the development of an "Index of Household Payments" and seeks feedback from users regarding their views on the required purpose and scope of the index, and its underlying methodology.

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# 1 . Background and aim

In March 2016, the National Statistician, John Pullinger, wrote to the chair of the UK Statistics Authority, Sir Andrew Dilnot, addressing the future of consumer inflation statistics in the UK (Pullinger, 2016). In helping shape the future of consumer price statistics, we have been exploring the concept of an index that measures changes to the cost of payments made by households. This approach was developed in Astin and Leyland (2015), who proposed a “Household Inflation Index” that they argue would better reflect costs as understood and experienced by the household.

We have started to explore the concepts and the feasibility of producing an index in this manner, and have been considering how an index of this kind could be developed while maintaining the quality and integrity of the output. The proposals made have therefore been considered against the “Guidelines for Measuring Statistical Output Quality” (ONS, 2013), which addresses 5 quality dimensions: relevance; accuracy and reliability; timeliness and punctuality; accessibility and clarity; and coherence and comparability.

This paper aims to set out the discussion points for each of Astin and Leyland’s proposals <sup>1</sup>. It does not aim to provide any concrete proposals on how the index should or should not be produced. Instead, it aims to raise issues that may be pertinent to the development of the index. We are seeking feedback from users on the purpose and scope of the index, and its underlying methodology.

We welcome responses to this paper by 26 September 2016. Please submit responses in writing to: Helen Sands, Prices Division, Office for National Statistics, Cardiff Road, Newport, NP10 8XG or by email to: [cpi@ons.gsi.gov.uk](mailto:cpi@ons.gsi.gov.uk).

We have provided questions to guide responses in Appendix A. Open responses to this paper are also welcome.

## Notes:

1. Although the proposals addressed in this paper are those of Astin and Leyland, the views within are those of ONS. This paper has benefitted from the input of a range of ONS experts including, but not limited to, Jonathan Athow, Joanna Bullman, Eric Crane, Phil Gooding, Kelly Hubble, Tanya Flower, Gareth Powell, Mike Prestwood, Nathan Thomas, Richard Tonkin, James Tucker, Phil Wales, Bella Wheeler and Joe Winton. We also acknowledge many useful comments and assistance from external experts, including John Astin, Rupert deVincent-Humphreys, Rosemary Foster and Jill Leyland. Any remaining mistakes or omissions remain our own.

# 2 . Introduction

UK Consumer Price Indices (CPI and CPIH) are designed according to international guidelines to measure “inflation as perceived and experienced by households in their role as consumers” (ILO, 2004). CPI focuses on changes in the price of consumption goods and services acquired and used by households. CPIH extends this measure by using the rental equivalence method to incorporate the flow of services provided by owner-occupier dwellings, but not the investment asset value of the dwelling. The focus on consumption means that aspects of expenditure associated with bringing consumption forward from, or deferring it until, the future (for example, interest payments) are excluded from these measures. Furthermore, certain payments that affect both income and expenditure (for example, insurance) are measured net of any income received.

Astin and Leyland (2015) suggest that since such household payments can account for a large proportion of a household's budget, and are made to satisfy a household's needs or wants, there is a case for producing a broader index that tracks payments in a way that is arguably more notable to households. The index should therefore represent the cost of monthly outgoings at the time that payments are made by the household, rather than when goods or services are acquired. Although the index will share many commonalities with CPI and CPIH, Astin and Leyland propose the following modifications that should better meet the index aims:

- application of equal weight to the expenditure of all UK households (household weighted)
- inclusion of the gross cost of interest (for example, the cost of interest payments on loans, with no adjustment for interest received from money held in savings)
- inclusion of gross insurance premiums (the full cost of insurance premiums with no adjustment for insurance payouts received)
- measurement of price changes, in principle, at the time that goods and services are paid for, rather than when they are acquired
- utilisation of a payments approach to measuring owner-occupier housing costs, and the inclusion of some measurement of the capital cost of housing

A comprehensive breakdown of similarities and differences in general concepts and specific item coverage between the proposed index and UK measures of inflation can be found in Appendix B: Tables 1 and 2 respectively.

The concept of a household payments index was also addressed in Paul Johnson's UK Consumer Price Statistics: A Review (2015), which concluded that there did not appear to be a case for a single "household" measure, although measures of change to the cost of payments experienced by different socio-economic groups could provide useful information to users. The review went further to recommend that if measures of this kind were to be produced, they should be published alongside measures of household income by different socio-economic groups. This means that changes in household costs that also affect income (for example, interest rate changes that affect both payments of loans and savings) are fully reflected and understood.

## Terminology

Unlike traditional approaches to measuring inflation, this index is proposed to measure changes to the cost of a fixed basket of payments made by the typical household. The rest of this paper will therefore refer to the index as the "Index of Household Payments" (IHP).

Astin and Leyland (2015) refer to democratic weighting (expenditure of the average household) and plutocratic weighting (average expenditure of all households) as "household" weighting and "expenditure" weighting respectively. This paper will refer to "household expenditure" weighting and "economy-wide expenditure" weighting respectively. The differences between these options are described further in Appendix C.

## Structure

Section 3 of this paper will address the 5 quality dimensions with regards to the index as a whole. Section 4 will discuss in more detail the proposals that have been made with regards to the feasibility and quality of the output. Section 5 will summarise the current position and outline our next steps in developing the index further.

# 3 . Guidelines for measuring statistical output quality

The quality of a statistical output is most usefully defined in terms of how well the output meets user needs, or whether it is “fit for purpose”. In assessing the quality of an output, we follow a set of guidelines to ensure that official statistics are produced to a level of quality that meets users’ needs (ONS, 2013). Although these are guidelines and not requirements, they represent good practice for measuring quality throughout the statistical production process. Within these guidelines, it is recommended that producers of statistical outputs report quality in terms of 5 dimensions: relevance; accuracy and reliability; timeliness and punctuality; accessibility and clarity; and coherence and comparability. These dimensions are outlined below with details of how the Index of Household Payments (IHP) could be developed with regards to each dimension.

## 1. Relevance

Relevance is defined here as the degree to which statistical outputs meet the potential needs of users. Any assessment of relevance therefore needs to consider the potential users of the statistics, what their needs are, and how well the output meets these needs. This is a particularly important dimension in the development of the IHP, as constructing the index for a particular purpose will go a long way towards determining what can or cannot be included, what methods should be used, and why.

The IHP has the potential to provide information that will be highly valued by users that wish to better understand changes to the cost of a fixed basket of payments made by the average household. To ensure this user need can be met by the IHP, each proposal suggested by Astin and Leyland (2015) should be discussed in terms of how well it captures the perceived experience of a typical household when considering payments or outgoings. The index would also be complementary to measures of consumer inflation in the UK, which focus on measuring inflation for the aggregate household sector.

As well as complementing the UK’s measures of inflation, ONS believes that the IHP could go further, and contribute to a body of statistics that tell a story of economic wellbeing at the household level. As such, there may be good reason to ensure that this index complements measures of household income (for example, “The Effects of Taxes and Benefits on Household Income” (ETB, ONS))<sup>1</sup>. Constructing these measures on a comparable basis could contribute to the existing literature on household economic wellbeing, which already informs government policy and debate. Further benefits could also be derived from constructing the IHP for different socio-economic groups within the population. This builds on previous work by Flower and Wales (2014), which suggests that the price experience of different types of UK household have varied widely over the period 2003 to 2014.

It should be noted here that this may not be the full extent of potential uses of the IHP. We hope to identify potential users through responses to this paper, and will discuss the index further with the Advisory Panels for Consumer Prices (APCP).

## 2. Accuracy and reliability

Accuracy is defined as the closeness between an estimated result and the (unknown) true value. Accuracy can be split into sampling error and non-sampling error, where non-sampling error includes: coverage error, non-response error, measurement error, processing error and model assumption error.

Conceptually, the IHP should measure the changes in the cost of a fixed basket of payments made by the typical household. Addressing the accuracy and reliability of this requires further investigation surrounding how this can be achieved regarding data availability and developed methodology. This is considered with more detail for each proposal in Section 4.

To ensure accuracy, aspects of the index such as formulae, aggregation, and classification are expected to follow the same procedures and methods that have already been established for CPI and CPIH, unless differences are necessary in meeting the specific requirements of the index. In the event that new procedures are proposed (for example, in the calculation of interest payments), we will seek guidance on these methods from the APCP.

As Johnson (2015) suggests, it may not be viable to produce a single index that accurately reflects the payments experience of the average household, given the diversity of households within the UK<sup>2</sup>. A higher level of accuracy would be achieved through the production of relevant sub-group measures. Although we recognise that a single index may be useful as a reference point for these subgroup measures, care should be taken when referring to the IHP as an index that can accurately reflect the experience of any typical, or “average”, household.

### **3. Timeliness and punctuality**

An assessment of timeliness and punctuality should consider the time required to produce the statistical output, the frequency of release and the punctuality of release.

To provide a rounded picture of economic wellbeing at the household level, a payments measure of this kind would need to be presented alongside a measure of income, typically published annually. Furthermore, adding to the number of monthly indices that measure changes in price, at a time where there is a strong focus on economic statistics, may not prove helpful to many users who wish to understand and reference a single measure of price change. As a result of these considerations, we support the view that the IHP is published annually, alongside measures of household income.

The question of timeliness, however, will be better answered following thorough establishment of user needs. The IHP should be published at a frequency that best meets user needs, and quickly enough after the period in question to best meet these needs while ensuring sufficient time is given to produce and quality assure the index.

### **4. Accessibility and clarity**

Accessibility is defined as the ease with which users are able to access the data. It also relates to the format in which the data are available and the availability of supporting information. Clarity is the extent to which easily comprehensible metadata are available, where these metadata are necessary to give a full understanding of the statistical output.

The publication of IHP would be modelled on current accessible publications of UK measures of consumer price inflation, with the corresponding metadata and supporting information made available alongside the release. Introducing the IHP may reduce clarity for users looking to reference a single measure of price change, or knowing which measure to use if unfamiliar with the literature. ONS can address this by providing documentation that clearly explains the differences in concepts and purpose between the IHP and the UK consumer price inflation measures.

### **5. Coherence and comparability**

Coherence is the degree to which the statistical processes, from which 2 or more outputs are generated, use the same concepts and harmonised methods. This should be addressed in terms of: coherence between data produced at different frequencies and other statistics in the same socio-economic domain. Comparability should be addressed over time, spatial domains, and sub-populations (for example, household type).

In addressing this dimension, ONS should ensure that the IHP is generated using the same concepts and methods as other statistical outputs in the same socio-economic domain to further contribute to the wealth of statistics and body of literature regarding the economy. Therefore, the index should be coherent with currently produced measures of household income. It should also be coherent with CPI and CPIH (except for the differences in scope and methods that are necessary for the IHP to meet the required concept of a household payments index). Finally, the IHP should also be coherent within itself, with the aim to adhere to the same reference framework throughout.

By addressing coherence in the above ways it is possible for the IHP to contribute to an improved understanding of economic wellbeing at a household level. At the same time, it should be noted here that the requirement for coherence should be balanced with the purpose of the index, as defined by user needs.

## **Notes:**

1. Detail as to how a payments measure could be matched with ETB is summarised in Appendix D.
2. To use Johnson's example, suppose the IHP includes the cost of credit. This may increase the value of the index when considering the impact of price changes on working age households and those in debt, but would have perverse effects when considering other groups, such as pensioner households and those with net savings.

## **4 . Feasibility and Quality of Proposals**

This section presents the proposals<sup>1</sup> made by Astin and Leyland (2015) and discusses them with regards to the feasibility of approach and the quality dimensions outlined in Section 3. Only quality dimensions relevant to a proposal have been addressed. The proposals have been summarised in Box 1, below. The final part of the section covers additional considerations that warrant further discussion, which are separate to the proposals made by Astin and Leyland (2015).

## Box 1: Astin and Leyland (2015) proposals for a household index

- a. **Weighting** – The index should use “household” weighting: each household in the reference population is given equal importance so that expenditure of the average household is calculated.
- b. **Coverage** – The index should reflect national expenditure (i.e. including UK residents’ spending abroad and excluding foreign spending in the UK), and cover all households, including institutional households (such as nursing and retirement homes).
- c. **Approach to timing (payments or acquisition)** – Changes in prices for items should, in principle, be reflected at the time of payment rather than at the point of acquisition. In practice, this will be noticeable only when there is a substantial difference between the acquisition of an item and when and how the item is paid for (for example: university tuition fees, air fares and package holidays).
- d. **Interest payments** – Interest payments on all loans should be included with no adjustment made for interest payments received as income.
- e. **University tuition** – University tuition fees should be included on a payments-based approach. This means that as well as including the upfront tuition fee, student loan repayments should also be monitored. Further, the interest rates on these loans should be recorded. Weights should be prescribed accordingly.
- f. **Insurance** – The full cost of insurance premiums should be included in the index with no adjustments made for insurance payouts. Life insurance, but not life assurance, is also considered in scope.
- g. **Taxation** – The index should include any taxes considered as part of a household’s outgoings and exclude any taxes typically deducted from income. This means that the index should include Council Tax and Stamp Duty land tax but exclude Income Tax and National Insurance contributions.
- h. **Owner occupiers’ housing (OOH) costs** – A payments approach to owner occupiers’ housing costs should be used, with all elements of owner occupier expenditure warranting inclusion. These elements include but are not limited to: mortgage interest payments, mortgage protection premiums, minor repairs and maintenance, Stamp Duty land tax, transaction fees, building insurance and ground rent.
- i. **Capital cost of housing** – As well as OOH costs, the index should include down payments, mortgage capital repayments and major renovations or extensions. There are 2 proposals: both suggest that the full cost to first time buyers should be included, but the second option also proposes to include the full cost of the housing market, with gross costs for first time buyers and net costs for subsequent buyers (net of payments received from the sale of a property).

### Notes:

1. A comprehensive breakdown of similarities and differences in general concepts and specific item coverage between the proposed index and UK measures of inflation can be found in Appendix B; Tables 1 and 2.

## a. Weighting

Proposal: The index should use “household expenditure” weighting: each household in the reference population should be given equal importance so the expenditure of the average household is calculated<sup>1</sup>.

Feasibility of proposal: True household expenditure weighting is not possible with current sources of data, as it would require information on the expenditure patterns of households over a long enough time period for these to be considered representative (Johnson, 2015); the Living Costs and Food (LCF) survey collects detailed household expenditure information, but this is limited to a 2 week period. However, there are feasible ways in which household expenditure weighting could be approximated. One such method is in the ‘trimming’ of the upper and lower income distribution tails (meaning a proportion of the highest-income and lowest-income households would be removed), using data collected using the LCF. Another proposed option is to “industrialise” the household expenditure weighting method used in Flower and Wales (2014), whereby LCF data was reconciled with the CPI expenditure totals<sup>2</sup>. This process divides reported total CPI expenditure on each COICOP class among the households that are observed in the LCF, in proportion to their observed spending on that class-level category. This means that the household level data is consistent with CPI weights when aggregated, and can therefore be used to calculate household expenditure weighted indices that can be compared to the published economy-wide expenditure weighted index. It also provides an average household expenditure for each COICOP class and corresponding weights for different subgroups of the population.

Relevance: Seen from the perspective of households, economy-wide expenditure weighted indices implicitly give more weight to higher spending households. As demonstrated in Flower and Wales (2014), such indices are broadly representative of the price experience of households around two-thirds of the way up the expenditure distribution. Household expenditure weighted indices are more representative of the middle of the expenditure distribution, and in that way should prove more relevant to households. However, if the data source is more reliable for economy-wide expenditure weighted indices (because adjustments for small sample sizes and underreporting in the LCF are made), and provided that subgroup measures can be derived from these – would a single household weighted index be any more relevant than economy-wide expenditure weighted subgroup indices? If household expenditure weighting is to be favoured, then the option to reconcile CPI expenditure totals with the LCF is preferred as it is more relevant to the whole UK population. Subgroup expenditure can then be derived from this dataset, and the corresponding indices calculated.

Accuracy and reliability: The LCF alone does not accurately capture expenditure on certain items (for example, under-reporting for alcohol and tobacco) and the sample size for a number of items (for example, private medical expenses), may be too small to get a realistic estimate of expenditure. Therefore, the use of LCF data alone may lead to volatile or unrealistic weights in certain areas. However, these considerations will also affect the reconciliation of total LCF and CPI expenditure data. In COICOP classes where the sample size is limited, large proportions of total CPI expenditure data may get allocated to a small number of households, resulting in unrealistic expenditure patterns. In these cases Flower and Wales (2014) used a simple proxy method to allocate total CPI expenditure on a COICOP class using reported LCF household expenditure on a higher aggregate. This is relatively simple to achieve for classes that are always affected by either low sample size or higher levels of expenditure in the CPI expenditure totals compared to the LCF. However, for some classes the need to use these proxies can vary year-on-year. Changing how expenditure is distributed from the CPI expenditure totals to the LCF affects the relative weights, therefore an established set of rules for dealing with these cases will be necessary, to ensure the series is future proof.

Timeliness and punctuality: The expenditure data is published with a significant time lag, but this can be resolved through price updating as it is in measures of consumer price inflation. There is a question of how quickly weights can be produced once the expenditure data is received. This will fall to the industrialisation and systematisation of the method, which will be discussed further once the methods and scope of the index have been decided. If a user need is established that requires timely production of the index, it may be that a readily established method of weighting (economy-wide expenditure weighting) is required.

Coherence and comparability: If the IHP were to be constructed based solely on the LCF expenditure data, it may become difficult to distinguish how much of the difference between the IHP and CPI (or CPIH) is due to disparity in concept, and how much is due to fundamental differences in the underlying data sources. With this in mind, any method for weighting the index should result in total expenditure for each COICOP class being equal to that in the CPI expenditure totals, unless modifications in expenditure totals are necessary in meeting the specific requirements of the index.



In addressing coherence with other statistics in the same socio-economic domain, namely a household income measure, economy-wide expenditure weighted indices would generally be preferred so as to match relative expenditures of the household sector with relative incomes of the household sector. However, the Canberra Group Handbook on Household Income Statistics (paragraph 6.8.1) indicates “[economy-wide expenditure weighted indices] may not suit income studies that wish to attribute equal weights to all households.” (UNECE, 2011). This suggests that if a household weighted payments measure was matched to a household weighted income measure, this could also provide a useful indication of real income at the household level.

**Notes:**

1. As opposed to economy-wide expenditure weighting which effectively weights households proportionally to their expenditure, resulting in average expenditure of all reference households being realised. Appendix C provides further explanation on the difference between these weighting methods.
2. Mainly drawn from Household Final Consumption Expenditure (HHFCE, ONS) with modifications made where necessary (for example, package holidays and insurance)

## **b. Coverage**

Proposal: The index should reflect national expenditure (i.e. including UK residents' spending abroad and excluding foreign spending in the UK), and cover all households, including institutional households (such as nursing and retirement homes).

Feasibility of proposal: Population and expenditure coverage is mostly determined through the data source used for the weights. The LCF captures national spending of private UK households (non-institutional). Although Household Final Consumption Expenditure (HHFCE, the source from which most CPI weights are derived) captures national and domestic spending of all UK households, national spending is not available at the COICOP level of aggregation. As it is not possible to determine the items that UK residents are paying for when abroad from either source, having national rather than domestic expenditure coverage would be intrinsically difficult. Price collection for goods and services purchased by UK residents abroad provides a further significant challenge, firstly in determining which items to price, and secondly in the pricing of these items and the translation of currencies.

Relevance and accuracy: Johnson (2015) argues that having domestic instead of national expenditure coverage would make minimal difference to a household expenditure weighted index. In reviewing the UK National Accounts Blue Book, 2014 edition (ONS, 2014), Johnson found that around 97% of UK spending is domestic, suggesting that there would be little difference between UK national and UK domestic expenditure weighting. Based on these findings, it could be argued that the matter of domestic or national coverage bears little importance to the IHP, and therefore the matter need not be pursued.

Coherence and comparability: To be coherent with a measure of income the IHP should have the same underlying population coverage, presumably in most cases this would be UK households. For example, the “Effects of Taxes and Benefits on Household Income” (ETB) measure covers UK private households (ONS, 2015) and, as such, a comparable payments index should use the same population base: UK private households.

## **c. Approach to timing (payments or acquisition)**

Proposal: Changes in prices for items should, in principle, be reflected in the IHP at the time of payment rather than at the point of acquisition. This will be noticeable only when there is a substantial difference between the acquisition of an item and when and how the item is paid for. For example, this is important for items such as university tuition fees, housing costs, air fares and package holidays.

Feasibility of proposal: A payments approach for tuition fees and housing costs is addressed under sections (e.) and (h.) respectively. Using a payments approach for other items is feasible in theory, as indices can be rebased to the time of payment, provided that the point of payment is identifiable. Airfares and sea fares are collected for the CPI and CPIH with identifiable payment points, so rebasing the indices would be feasible. For other items that have a substantial difference between payment and acquisition (for example: package holidays, music festivals, horse racing admission, sports tickets) this is more challenging, as they have not been collected with a specific lead time so identifying a point of payment becomes extremely difficult. This approach may also require a methodology change for purchases that are made on a credit card or using a loan, given that the item is not paid for at the time it is acquired. However, there are currently no known data sources that are available to ONS that contain this information, and therefore it is not currently feasible to make these adjustments.

Relevance: Reflecting payments as they are made would ensure that the IHP is more relevant to understanding the monthly payment experience of the typical household. For example, if a household pays for a February ski holiday in August, the household experiences the price change in August and not the February in which the holiday is acquired. Therefore, the IHP should aim to reflect advance payments at the time that they are made, wherever possible, in order to be relevant to a household's experience.

Timeliness and punctuality: Releasing data based on a payments approach may aid the forecasting of movements in the acquisition-based CPI and CPIH, which may follow on a lagged basis. This could have a knock-on effect in the financial markets. As stated in Protocol 2, Paragraph 8 of the Code of Practice for Official Statistics (UKSA, 2009), we should "Ensure that no indication of the substance of a statistical report is made public, or given to the media or any other party not recorded as eligible for access before publication". As the IHP would use data relevant to future releases of CPI and CPIH, would including the aforementioned items on a payments-based approach limit our ability to release the index in a timely enough manner to meet user requirements?

Coherence and comparability: In terms of coherence, a household income measure would benefit from being compared to an index that more accurately reflects monthly outgoings, and therefore a payments approach would be appropriate. However, in aiming for coherence within the IHP itself, a decision to treat 1 item on a payments-based approach should mean that all items should be treated in this way. This provides difficulties for items in cases where there has not been an identifiable payment point in the past. There is perhaps an argument that only those items with large enough expenditure warrant calculation in this manner, in which case there needs to be consideration as to where a consistent cut-off point would be. It could otherwise be proposed that all items should be treated the same as in the CPI and CPIH, unless the payment takes up a significant part of a households' regular monthly payments (for example, housing costs, paying off student loans and car purchase loans). In this way, items such as airfares and package holidays would be seen as irregular annual payments, and would continue to be included on an acquisitions-based approach.

## **d. Interest payments**

Proposal: Interest payments on all loans<sup>1</sup> should be included with no adjustment made for interest payments received as income.

Feasibility of proposal: As we already calculate an index for mortgage interest payments is, it is feasible for the IHP to incorporate this type of interest. We do not currently collect data on interest rates for other types of debt, therefore this would require additional resource. The Bank of England (BoE) collect the stock of loans, interest payments and interest rates data covering monetary financial institutions (namely banks and building societies) for statistical purposes. However, this does not include data from companies not regulated by BoE (for example, car finance and payday loan companies).

Calculation of a price index for interest rates can be intrinsically difficult, given that there is no specific "price" associated with interest. A potential method of calculation would be to use monthly interest rate data and apply it to the stock of debt held by households to determine the cost of interest payments being made. This measurement would include an estimate of the changing value of money in each month. To account for this, the value of money as experienced by consumers can be proxied by inflation.

**Relevance and accuracy:** Reflecting interest rates is relevant when considering payments made by a household. As households pay interest on a variety of debt (not just mortgages), interest paid on all loans and other types of debt should be covered. However, given that the value of debt held by households can change each month, it may prove challenging to calculate this accurately in a way that is relevant to the household's experience.

**Timeliness and punctuality:** The BoE interest rate data could be provided to us on a month lag. If the index was to be published annually the actual effective rate could be used for calculation. However, if produced on a more frequent basis, interest rate forecasts may need to be used.

**Coherence and comparability:** The classification structure used for CPI and CPIH (based on COICOP) does not include interest payments. The structure will therefore have to be adjusted for IHP to account for these additional items it will be important to maintain as similar structure as possible for comparability. There are 2 possible options. Firstly, interest rates could be classified as additional expenditure for the item for which the loan is given (for example, payments of interest on cars purchased through finance options could be included alongside car purchases). However, this is not possible for interest on loans and credit cards that cover purchases of different goods and services. The second option is to assign interest rate payments their own class within the COICOP structure. As there is already a COICOP class for Financial Intermediation Services Indirectly Measured (FISIM), it may be viable to use this class as a placeholder.

In terms of coherence, a household income measure would benefit from being compared to an index that measures interest payments on a coherent basis, as income measures typically include gross interest received over the period. The gross cost of interest should be included in a matched payments measure, provided that the calculation is accurate and these measures are presented together. For example, ETB is inclusive of interest received, so could be presented alongside a payments-based measure that is inclusive of interest paid.

**Notes:**

1. Including, but not limited to: mortgages, car finance, holiday finance, finance for durable goods, bank loans, credit card loans and payday loans

## **e. University tuition**

**Proposal:** University tuition fees should be included on a payments-based approach. This means that as well as including the upfront tuition fee, student loan repayments should also be monitored. Further, the interest rates on these loans should be recorded. Weights should be prescribed accordingly.

**Feasibility of proposal:** Calculating an index for student tuition fees is made complex by the differing approaches to fees and repayments taken by the academic institutions in England, Northern Ireland, Scotland and Wales. While we currently collect price data for tuition fees, obtaining expenditure information for a payments-based approach that captures the number of students who pay upfront fees may be challenging. This is due to the multitude of different ways that tuition fees can be paid (loan, upfront, bursaries and grants) and how this differs between undergraduate, postgraduate, full and part-time students. The data required to calculate capital repayments of student loans and interest payments is not currently collected by us, but is held by the Student Loan Company (SLC).

**Relevance:** There are arguments for and against the relevance of student loan repayments in the IHP. A student loan could be considered as a form of income tax: graduates are required to pay back a fixed percentage of their income, only once they are earning over a particular threshold. As income tax is excluded from such measures, there is an argument that student loan repayments should be treated in the same way. However, student loan repayments can also be considered as a proportion of households' monthly outgoings. It is therefore unclear whether student loan repayments are relevant to the typical household when considering monthly payments made.

To ensure tuition fees payments are relevant to the household, the expenditure needs to be adjusted accordingly as the upfront fee is only relevant to a small proportion of the population who actually pay their fee at the beginning of the course. Interest rates are discussed above and are considered relevant to the household when considering monthly payments.

**Accuracy:** As well as covering tuition fees, most student loan repayments also cover maintenance costs (for example, rent, food and books). The payments covered by these maintenance loans will have already been counted as expenditure, so there is a possible risk of double counting if student loan repayments are also included. To ensure accuracy, the weight for items that students spend their loan money on could be adjusted accordingly, although this would be a complex task. Another option would be to only include the interest payments on the maintenance loan. However, student loan repayment data is not split between maintenance and tuition fee loans, which could prove a further significant challenge. An accurate method for incorporating a payments-based approach to university tuition fees needs further consideration.

**Coherence and comparability:** If household income measures do not deduct the payment of student loans it would be beneficial to include repayment of student loans in a matched payments measure, so that any changes in costs to the household are captured. If household income does deduct student loan repayments, then the reverse of this would be true because the changes in costs to the household are still captured, through the change in income. For example, the ETB does not take into account payments for student loans, so a matched payments measure should be capturing changes in student loan repayments.

To ensure coherence within the IHP, there are a number of other items that could be considered in a similar manner. For example, a number of households do not pay upfront for a car, choosing to finance it instead. Should cars then be included in the index in this manner, including the upfront cost, capital repayment and interest rate with weights prescribed accordingly? This is an area that may require further consideration.

## **f. Insurance**

**Proposal:** The full cost of insurance premiums should be included in the index with no adjustments made for insurance payouts. Life insurance, but not life assurance, is also considered in scope.

**Feasibility of proposal:** Gross expenditure on insurance premiums is captured in the LCF. Prices of insurance premiums, excluding life and building insurance, are also already included within the calculation of CPI and CPIH. Therefore, inclusion of most types of insurance on a gross basis is feasible for the IHP. As life insurance is not currently collected, it would require additional resources for it to be included.

**Relevance and accuracy:** Including insurance premiums on a gross basis may prove relevant to the typical household who see insurance premiums as a significant part of their monthly outgoings. Life insurance is also a regular payment relevant to a typical household and therefore its inclusion warrants further consideration. However, to accurately include gross insurance payments in the IHP, it may require a reduction in expenditure elsewhere to avoid double counting. For example, if car prices increase, this may lead to a rise in the cost of insurance premiums. If these rises were captured in both car prices and insurance payments, the apparent increase in inflation would be magnified. Without being able to reduce the expenditure in other areas, estimates of expenditure on net insurance claims (expenditure on premiums minus insurance payouts) may be preferable for an accurate measure of insurance that avoids double counting. Nevertheless, if the household does experience the inflationary pressure twice (once when their premium goes up and once when they use their payout to buy a new car) then it may be argued double counting is necessary to be relevant to the household.

Life insurance premiums are often regarded as a financial investment; it constitutes the purchase of a financial asset, which could be considered out of scope. In the event of a household member's death, the household would receive the payment back, and in that sense it could almost be regarded as a household's (rather than an individual's) saving account. However, life insurance is a payment made by a household to satisfy their needs and wants and therefore may be considered relevant, and treated in the same way as non-life insurance.

Coherence and comparability: To include the gross cost of insurance premiums would be incoherent with measures of household income, which do not include receipts from insurance claims<sup>1</sup>. As such, a matched payments measure for household income should be net of any income received to ensure that the full household experience (income and payment) is duly accounted for.

**Notes:**

1. Why does this follow? Say for example in one year someone's house burns down, it would appear that the household has a £200,000 spike in income for that year. As claims are irregular movements in income they can make trends difficult to determine and so are excluded from these measures.

## **g. Taxation**

Proposal: The index should include any taxes considered as part of a household's outgoings and exclude any taxes typically deducted from income. This means that the index should include Council Tax and Stamp Duty land tax but exclude Income Tax and National Insurance contributions.

Feasibility of proposal: As we already calculate price indices and expenditure estimates for both Council Tax and Stamp Duty land tax, including them in the IHP is feasible.

Relevance and accuracy: As council tax and stamp duty are payments made by the typical household, they are relevant to the IHP. The methodology underlying the collections has already been established for other measures and so the accuracy of this data will be of the same quality.

Coherence and comparability: Income measures can be produced with and without adjustments for tax payments and a matched payments measure should be adjusted to account for this. This means that the price change will only be captured once, and when produced alongside each other a coherent picture of a household's income and outgoings would be provided. For example, as the Effects of Taxes and Benefits on Household Income (ETB, ONS) already accounts for changes in tax payments, taxes should be excluded from a matched payments measure.

## **h. Owner occupiers' housing (OOH) costs**

Proposal: A payments approach to owner occupiers' housing costs<sup>1</sup> should be used, with all elements of owner occupier expenditure warranting inclusion. These elements include but are not limited to: mortgage interest payments, mortgage protection premiums, minor repairs and maintenance, Stamp Duty land tax, transaction fees, building insurance and ground rent.

Feasibility of proposal: We already calculate price indices and expenditure estimates for the items outlined above. Therefore, the inclusion of these items in the IHP is feasible.

Relevance and accuracy: These are payments made by the typical household and should therefore be considered in scope of the index. Expenditure and price data are readily available to ONS so accuracy of this data should be of an acceptable quality.

Coherence and comparability: A payments-based approach to calculating housing costs may also be coherent with typical measures of household income, provided that the payments captured within the IHP do not add to the value of the property itself, and that housing costs are not deducted from the income measure. For example, as housing costs are not deducted from the ETB, they should be included in a matched payments measure.

Buildings insurance would require treatment coherent with other types of insurance within the IHP. This may prove difficult if a net approach to insurance premium costs is agreed, as net expenditure on buildings insurance is not calculated for the CPIH as it is implicitly captured through expenditure on imputed rent<sup>2</sup>.

**Notes:**

1. The payments approach is defined by looking at what households pay out as owner occupiers (excluding capital payments (see part [i])
2. The rental equivalence approach used in CPIH treats housing as a capital good that is not itself consumed: instead, it provides a service that the owner occupier consumed. It argues that people who own their own home can either live in it or rent it out. Therefore, the rent the owner occupier could have received is a measure of how much these services are worth. The rent charged by landlords covers not just the property but many of the other costs borne by owner occupiers, such as building insurance and minor repairs and maintenance. Therefore these are not estimated separately, as to do so would introduce double counting.

## **i. Capital cost of housing**

**Proposal:** As well as OOH costs, the index should include down payments, mortgage capital repayments and major renovations and extensions. There are 2 proposals: both suggest that the full cost to first time buyers should be included, but the second option also proposes to include the full cost of the housing market, with gross costs for first time buyers and net costs for subsequent buyers (net of payments received from the sale of a property).

**Feasibility of proposal:** We currently produce a first time buyer's index with data that is received from the Council of Mortgage Lenders (CML). Although the first time buyer's index is not reflective of a payments approach, the underlying data could potentially be used in the calculation of a down payment and capital repayment element of an index. Calculating a price index for down payments will prove challenging, as households choose how much money to pay as a deposit. We do not collect current prices for major renovations and extensions, therefore a source for this data would need to be established and collection or processing of this data would require additional resource.

**Relevance:** While home ownership confers some benefits over renting (for example, the ability to decorate and to have stability in living arrangements), it can be regarded as the purchase of an asset. Ownership of a property is often a household's most important store of wealth. Measures of inflation aim to exclude the capital element of house purchase or ownership because they add to household wealth, rather than spending on consumption. However, the payments associated with the purchase of a house can be a major element of a household's budget, so it may be relevant to include these payments in the IHP. Nevertheless, even if the principal reason for purchasing a house is not to acquire an asset, wealth can still be realised through selling the house, which would need to be accounted for.

It could be useful to see the effects of the cost of housing on different socio-economic groups within the population. There is perhaps an option that 2 indices could be developed, with and without the capital payments made by home buyers or home improvers; the difference between these indices could also prove interesting.

**Coherence and comparability:** The inclusion of asset prices in a measure of consumer inflation is far removed from traditional methodology and is incoherent with methods used by National Statistic Institutes (NSI)<sup>1</sup>. An asset price should not be included in an index that is to be compared with a measure of income. This is because wealth realised from selling a house is not accounted for in any known measures of household income, thus any income received from selling a home should be accounted for in a matched payments measure. In this way, any costs of purchasing a house should be net of any wealth realised through selling one, which could lead to zero or negative expenditure. This area requires further investigation.

However, there is an argument that the inclusion of house purchases ensures coherence within the IHP itself, and its proposed purpose. When thinking about payments being made, a house is certainly something paid for to satisfy a household's needs or wants. If this is to be used as a reference framework for the index, inclusion of these costs may be justified.

**Notes:**

1. We are currently unaware of any other NSIs that include full asset costs in a measure of consumer price inflation.

## **Additional considerations**

When considering payments made by the household, there are other items in scope of the index that merit additional discussion. In particular, the treatment of second hand goods, the inclusion of the cost of gambling, and payments for black market and illegal products all warrant further thought.

When considering a payment-based approach, the full cost of any second hand goods purchased by the household should be included. However, second hand goods are typically inter-household transactions, which mean that income is also received through the selling of these goods. As typical income measures are not inclusive of income from the sales of second hand goods, a matched payments measure would need to have expenditure weights that are net of any income that is received, and would for the most part be zero – except possibly when considering larger transactions such as second hand cars, which are already included in CPI and CPIH. There is also a question of whether or not to include charity shop purchases. Households donate items to a shop which are then purchased by another household. This is within scope of a payments-based index, and therefore it would be relevant to incorporate charity shop purchases into the IHP. However, attempting to price a fixed basket of charity shop goods may prove extremely challenging.

Gambling costs can also be considered in scope as a payment made by a typical household. However, measuring gambling costs on a gross basis would prove challenging as households generally choose how much they wish to pay when making a bet. Some forms of gambling do have a fixed price (for example, lottery tickets and scratch cards); however, as the prize amount fluctuates, some form of quality adjustment would be required to account for changes in potential winnings. As typical income measures do not include any gambling winnings, a matched payments measure should be net of winnings. Net expenditure on gambling is available to us through the HHFCE, and a price index could presumably be modelled using what is known as the “house edge”<sup>1</sup>.

Payment for black market and illegal products should also be considered in scope of the index as these items are bought to satisfy a household's needs or wants. However, obtaining price data for these items is not particularly feasible at this time. Although these payments would not be included in any initial production of the index, they should be considered in scope of the IHP and face future review.

The items above may also be relevant to other price or payment indices, but may need to be considered in a different way to traditional measures of price change. There may also be other considerations that are not covered here that are pertinent to the development of the IHP. It is hoped that anything which has not yet been discussed will be brought to the attention of ONS before decisions are reached as to the scope and future development of the index.

**Notes:**

1. The “house edge” is defined as the casino profit expressed as a percentage of the players original bet, which could approximate the service charge paid when gambling.

## 5 . Summary and Next Steps

### Summary

This paper has explored the main discussion points for the development of an index that measures changes to the cost of payments made by households, as proposed by Astin and Leyland (2015). We have not yet made any concrete decisions on the scope and coverage of the IHP, and it is clear that further thought is required in a number of areas. Appendix E provides a summary of where new data may need to be sourced or new methodology may need to be established. Future development of the IHP requires a clear reference framework and purpose that will guide the scope of the index and frequency of production. A number of the proposals discussed in Section 2 are feasible in practice, but many require additional resource. This will need to be considered with regards to our budget and future work plans and priorities. This paper has also not considered the systematisation of the index, and this will play another large part in determining the production of the IHP and its associated costs.

### Next Steps

Below are our possible next steps in developing an Index of Household Payments (IHP). These are subject to change based on responses received to this paper. Q1, Q2, Q3 and Q4 refer to Quarter 1 (Jan to Mar), Quarter 2 (Apr to Jun), Quarter 3 (July to Sep) and Quarter 4 (Oct to Dec).

#### Phase 1: Q3 2016 to Q4 2016

- Collate responses from stakeholders to fully establish user needs
- Discuss paper with both Advisory Panels for Consumer Prices (APCP) – Technical and Stakeholder
- Begin to consider systematisation of the IHP
- Hold workshop to discuss paper and responses
- Continue to investigate methodology and data sources for the necessary components of the index

#### Phase 2: Q4 2016 to Q1 2017

- Seek guidance on new methodology from the APCP
- Make a decision on a frame of reference for the index based on stakeholder requirements and seek guidance from the APCP
- Publication outlining final decisions regarding the index
- Continue to investigate methodology and data sources for the necessary components of the index

#### Phase 3: Q1 2017 to Q2 2017

- Initiate collections of any new items to be included in the experimental IHP
- Begin building IHP into a test system



## Phase 4: Q3 2017 to Q4 2017

- Release the first experimental IHP as part of a wider analysis of income, expenditure and price change

## 6. References

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## 7. APPENDIX A: Questionnaire for responses to this paper

We have provided the following questions as a guideline for responses, but any additional comments or observations will be taken into consideration. Please ensure you include your name and organisation in your response and submit it by email to [cpi@ons.gsi.gov.uk](mailto:cpi@ons.gsi.gov.uk) or in writing to Helen Sands, Prices Division, Office for National Statistics, Cardiff Road, Newport, NP10 8XG by 26 September 2016

1. Do you believe that there is a need for this type of index? If so, why?
2. What is your need for this index and why do you believe it would be suitable for your need?
3. How frequently would the index need to be published to meet this need?

### To best meet the need stated above:

4. What is your preferred treatment for weighting (for example, household expenditure weighted or economy-wide expenditure weighted)?
5. What is your preferred population (for example, all UK or private UK) coverage?
6. What is your preferred expenditure (for example, national or domestic) coverage?
7. What is your preferred approach to timing?
8. What is your preferred treatment for the following items?

- interest payments
- student loans
- insurance premiums
- life insurance premiums
- taxation
- owner occupier housing costs excluding capital costs
- capital housing costs

9. Are there any other areas you believe we need to consider with regards to this index?

10. Do you have any additional comments?

## 8. APPENDIX B: How do the measures compare?

The 2 tables below attempt to summarise the similarities and differences between the Astin and Leyland (2015) index constructed as proposed, and the 4 measures of consumer price inflation. Please refer to the original paper for further details of proposals in each case.

### 1. General concepts

	Astin-Leyland proposed index	CPI / CPIH	RPI / RPIJ
Perspective	Household perspective	Based on HICP, designed as macroeconomic index	Not explicitly designed from household perspective
Allow imputed items	No	None in CPI. Imputed rent in CPIH	Imputed measure of house depreciation included
Current designation	Does not exist	CPI current headline measure. CPIH awaiting reassessment to "National Statistic" status	RPI no longer "National Statistic". RPIJ little used
National or domestic expenditure	National	Domestic	Aims to be national
Household coverage	All UK households including institutional	All UK households including institutional	Private UK households excluding pensioners and top 4% earners
Population sub-indices	Sub-indices for specific population groups	No sub-indices but ongoing work to produce these for specific population groups	Pensioners and Rossi Indices
Acquisition or payments approach	Payments	Acquisition	Acquisition except mortgage interest and house depreciation
Weighting	Democratic (household expenditure)	Plutocratic (economy-wide expenditure)	Quasi-democratic (uses trimming)
Classification structure	ECOICOP (modifications if necessary)	ECOICOP	UK specific classification
Elementary aggregate formula	Dutot and Jevons (RPIJ)	Jevons and Dutot	RPI: Dutot and Carli. RPIJ: Dutot and Jevons

## 2. Specific item inclusion

	Astin-Leyland proposed HII	CPI / CPIH	RPI / RPIJ
Insurance weights	Gross	Net	Gross
Life Insurance	In	Out	Out
Mortgage Interest Payments	In	Out	In
Other loan interest payments	In	Out	Out
Capital Cost of Housing	In	Out	Out
Major renovations and extensions	In	Out	Out – proxied through house depreciation
Other repairs and maintenance	In	In	In
University Fees and Student loan interest	Loan interest, repayments and upfront fees included	University fees included	University fees for UK students included
Council Tax	In	Out (methodology is currently being developed to include council tax in CPIH)	In
Buildings insurance	In – Gross	Out – CPIH proxies through imputed rent	In – Gross
Estate agent fees	In	Out	In
Conveyance fees	In	Out	In
TV License	In	In	In
Vehicle Excise Duty	In	In	In
Trade Union Subscriptions	In	In	In
University Accommodation Fees	In	In	Out
Stockbroker Fees	In	In	Out
Forex Commission	In	In	Out

## 9. APPENDIX C: Household expenditure weights and economy-wide expenditure weights

Economy-wide expenditure weights aim to measure aggregate expenditure shares of the household sector. They are calculated relative to the total pounds sterling value of all items bought in the economy. In this case, the price movements of items are weighted in proportion to their importance to total household spending. A secondary consequence of this is that high-spending households have a greater weight in an index that uses economy-wide expenditure weights. This is because high-spending households influence the aggregate households' spending to a greater extent than low-spending households.

Household expenditure weights instead aim to measure the expenditure of the average household. They are calculated as the average proportion of each household's spending accounted for by that item. Theoretically, the expenditure of each household receives an equal weight.

These methods therefore reflect different concepts and fundamentally answer different questions. While economy-wide expenditure weighted indices measure the average change in price across all consumption goods and services purchased by households, household expenditure weighted indices reflect the price experience of each household equally.

In populations with homogenous expenditure, where all households purchase goods in equal proportions, these weighting methods, in theory, would result in identical indices. However, in populations displaying greater variation in expenditure baskets across households (for example, due to income constraints or differing tastes) the difference between these indices becomes more apparent.

## 10. APPENDIX D: Matching an Index of Household Payments with the Effects of Taxes and Benefits on Household Income (ETB, ONS)

This table displays a summary of the proposals made by Astin and Leyland (2015), the methods used in calculated ETB, and a household payment that would match this measure of household income.

### Matching an Index of Household Payments with the Effects of Taxes and Benefits on Household Income

	Astin-Leyland proposed HII	ETB	Matched Payments Measure
a. Weighting	Household expenditure weighted	-	Economy-wide expenditure weighted
b. Coverage	All UK households	Private households	Private households
c. Timing	Payments-based approach	-	Payments-based approach
d. Interest payments	Gross interest paid	Gross interest received	Gross interest paid
e. University tuition	Included (payments approach)	Not deducted from income	Included (payments approach)
f. Insurance	Gross premiums	Excludes interest payouts	Net premiums
g. Taxation	Include certain taxes	Accounts for tax payments	Exclude tax
h. OOH costs	All costs associated with owning a home	Doesn't account for wealth realised	All costs associated with owning a home (provided they do not add to value of house)
i. Capital housing costs	Include first time buyers and go some way towards including full housing market	Doesn't account for wealth realised	Capital costs net of wealth realised (from selling or renting of housing)

# 11. APPENDIX E: What is needed for the development of the IHP

The table below shows where data sources and methodology for the IHP would need to be established for the index as proposed. Cells marked with an X are where we may need to source new data sources or develop a new methodology.

## What is needed for the development of the IHP

Proposal	What is needed		
	Price data	Expenditure data	Methodology
a. Weighting			X
b. Coverage			X
c. Approach to timing			X
d. Interest payments	X	X	X
e. University tuition	X	X	X
fi. Insurance			
fii. Life insurance	X	X	
g. Taxation			
h. OOH costs			
i. Capital housing costs	X	X	X