ROYAL STATISTICAL SOCIETY
DATA | EVIDENCE | DECISIONS

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John Pullinger
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Dear John,

**Paul Johnson's Review of Consumer Price Statistics**

As this is my first letter to you since we each took up our current roles last July, I am sorry it is one where I have to raise concerns. I am writing on behalf of the Society rather than in a personal capacity, and am confident you will view the Society's concerns as those of a critical friend.

You are already aware that the Royal Statistical Society has reservations about some of the key conclusions of the review carried out by Paul Johnson into the range of consumer price indices. We accept a number of the report's assessments and applaud much of the research and the extensive discussion of issues, but we feel the recommendations fall short in a number of areas and some are simply wrong. I am writing therefore to set out the Society's key concerns and to outline what we feel now needs to be done.

We believe the review should have started from first principles by examining the different needs that consumer price indices aim to meet, then deciding what sort of index is required for each need and the extent to which they can, or cannot, be combined. Instead it simply asserts that "CPIH is conceptually the best measure of inflation in the UK" but sets out little, if any, justification for this or why it should have the recommended status of being the sole headline index.

The CPI, as the Harmonised Index of Consumer Prices for the UK, and by extension the CPIH, were designed for macroeconomic needs - originally for comparing inflation rates among European countries. However, the original and still crucial purpose of consumer price indices was to measure how the costs of household expenditure rose as a result of inflation, thus providing a broad guide as to how much incomes and other related matters might need to rise to compensate for this. This is why the Retail Prices Index (RPI) was originally designed (several decades before inflation targeting was first used). The CPI and its derivatives were not designed for these needs and the report does not provide any real argument for the CPI's use for these purposes.

Public confidence in any index used for uprating is more critical than for most statistics since it has a direct effect on people's incomes and spending. It follows that the index must provide a realistic estimate of how household costs evolve. Moreover, the phenomenon of inflation is observable by the population at large. We accept the report's broad conclusion that the RPI is no longer an ideal index. Its use is, nevertheless, deeply embedded. As a time honoured index it still enjoys a wide degree of public trust despite its recently publicised problems. Finding a successor that can be widely accepted therefore means establishing an index that meets the RPI's original purpose without its problems: and above all, an index that can be demonstrated to reflect actual household spending. Only then, in our view, will it be possible to urge people to abandon the RPI.

The research into the inflation experience of different households published on 15 December 2014 by the ONS (Flower and Wales: *Variation in the inflation experience of UK households: 2003-2014*) is telling. We fully support Paul Johnson's recommendation that the ONS should produce regular inflation indices for different household groups. However, we believe these should be based, to the extent possible, on actual household spending. We also believe this suggestion needs to be taken to its logical conclusion by combining the inflation indices to produce a "democratically weighted" overall index that is published monthly. Such a "household inflation index" (HII) would then be suitable for general uprating purposes as well as tracking the real growth in household income. When appropriate, indices for different population groups could be used for specific purposes, for example in the way that the Rossi index has been used for uprating benefits.

To be acceptable, such an index needs to cover owner occupier housing costs – a major part of many household budgets –in a way that seems credible to the man/woman in the street. This would include an allowance for mortgage interest and the capital cost of house purchase. We accept that the weight given to the latter needs careful consideration in view of the impact of house price appreciation on people's second and subsequent purchases. We do not see how rental equivalence can ever be a convincing measure (this applies also for macroeconomic needs).

We therefore urge that the approach of a full "household inflation index", based on actual expenditures incurred (a payments approach) be examined in detail and a practical route for its development set out. I hope you will ask ONS staff to work on this so that it can be one of the options in the consultation. As you are aware, both John Astin and Jill Leyland have published papers on this approach. We have asked them, in conjunction with other RSS members with specialised knowledge, to work on a more detailed initial proposal to submit to you.

Whatever way forward is chosen, the RPI will remain in practical use for many years yet. We acknowledge the constraints on changing it but feel strongly that within those constraints it should be produced as accurately as possible.

I hope these comments are helpful. We have also compiled a more detailed commentary on the report, which I enclose with this letter and which we would be delighted to discuss further. I am copying this letter to Andrew Dilnot, to Glen Watson and Derek Bird in the ONS, to Jon McGinty, the chair of the Statistics User Forum, and to Tony Cox, the chair of the RPI CPI User Group, as well as to RSS colleagues. In view of the Public Administration Select Committee's current inquiry into economic statistics I am also copying it to Bernard Jenkin MP.

Yours sincerely

Peter J Diggle
President

**Royal Statistical Society: Detailed Commentary on Recommendations from the Paul Johnson Review of the Range of Consumer Price Indices**

*This commentary has been prepared by John Astin, Michael Baxter, Mark Courtney, Jill Leyland and Philip Turnbull.*

**Recommendation 1.** *ONS should move towards making CPIH its main measure of inflation. In the meantime, the CPI should continue to be the main measure of inflation.*

We do not agree. A key essential is the need for an index that measures the cost of the household budget or what consumers pay to "satisfy their needs and wants". This was the original purpose of consumer price indices[1]; this concept – which we will call a Household Inflation Index (HII) – should be the aim of any index that is used for uprating, or influencing the uprating of, pensions, wages, benefits, tax brackets and any regulated price or business contract where the aim is to reflect the cost of the household budget. The Consumer Price Index (CPI) was designed for international comparison and macroeconomic purposes and, with the notable exception of owner occupier housing costs, fulfils this purpose well. It was not designed for uprating purposes and the report provided no real justification for the use of CPIH in this regard. (It also says very little about its suitability as a macroeconomic indicator.)

We acknowledge that a single "one size fits all" headline index has attractions and would avoid "index rate shopping". But this must not override the key need of statistics being fit for purpose. The Retail Prices Index (RPI) will not disappear for a long time. It is widely used in private pension schemes and business contracts in addition to its use in index-linked gilts. Despite its recently publicised statistical problems it still enjoys much public trust. The UK has to produce CPI under European Law, it is also the UK's Harmonised Index of Consumer Prices (HICP) and this will be the key index for international comparisons (we note that most European countries also produce their HICP alongside their national indices).

CPIH uses rental equivalence as a measure of owner occupier housing costs, the inclusion of this being the only difference with CPI. Leaving aside the recent issues with the rental price data being used, we feel that this concept is highly unsatisfactory. Trends in housing rental prices can diverge from costs of owner occupation over long periods of time. It also means that the index makes heavy use of imputed transactions, and the HICP itself looks likely in due course to include Owner Occupied housing using the Net Acquisitions method. Our own view is that this would be a better measure for the CPIH while a payments based approach possibly similar to that used by the RPI would be best for our proposed new Household Inflation Index.

Public confidence is crucial. An index is needed which has a clear relation to actual household costs, including those of owner occupiers. Economic theory can be helpful, but is inevitably over-simplified when applied to the complexities of index construction, and should not be followed slavishly, especially when it is counter-intuitive to the ordinary user.

**Our preferred solution would be:**

1. Develop a full Household Inflation Index (HII) designed to reflect the cost of the household budget and based, to the extent practical, on actual payments. This would match with the need to develop

[1] The ILO CPI Manual defines a consumption good or service as "one that members of households use, directly or indirectly"

indices for different household groups as suggested by the Johnson report in Chapter 5; it would use democratic weights, or an approximation, rather than average expenditure weights and would be compiled every month. This would become the headline measure recommended for uprating and related purposes and would eventually become a replacement for the old RPI. [2]

2. Replace rental equivalence in CPIH with Net Acquisitions, but make no further changes other than those agreed for HICP in the EU as a whole. In due course, therefore, this would in all likelihood merge with the CPI.

3. RPI will have to be maintained for many years as a legacy measure. Any improvements made to other indices should also be made to the RPI where possible, within the constraints of not making changes deemed to be fundamental, and materially detrimental to holders of index-linked gilts.[3] This is not merely because of the legal guarantees to holders of index-linked bonds, which will expire in 2030, but because any such change would also destroy the RPI's usefulness for other lenders and frustrate their legitimate contractual expectations.

**Recommendation 2.** *ONS should develop an annual analytical publication that produces inflation indices as experienced by a range of different household types, along with appropriate advice on what income measures these analytical indices can be compared to.*

This is an excellent suggestion. The research undertaken for the review into the inflation experience of different households was telling and made a clear case for the experience of different income and household groups to be monitored. Putting income measures alongside would enable a substantial improvement to be made in assessing the welfare of different sections of the population. This range of indices might only need to be published annually, but we would seek to have these inflation indices compatible with our proposed new overall monthly Household Inflation Index mentioned above.

**Recommendation 3.** *The Authority should consider making the case for legislation governing the production of CPIH, guaranteeing its production and setting out the process for making major methodological changes.*

We strongly oppose legislating for any specific series. This would undermine the professional independence of the ONS and would be a breach of the code of practice (and the EU code). It could also limit or delay necessary improvements. The RPI was only covered in the 2007 Statistics and

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[2] The following papers set out very similar proposals to this one and were both referred to in the Johnson review itself: i) Leyland, J. (2014): 'What should an uprating index look like?' Available at: http://www.statsusernet.org.uk/communities/resources/viewdocument/?DocumentKey=0cb5a678-9e41-4a9c-aa39-b35aed53bf7f&MessageKey=b1396916-017c-4450-8146-06d872670c62
ii) Astin, J. (2014): 'Options for a new Household Inflation Index'. Available at: http://www.statsusernet.org.uk/communities/resources/viewdocument/?DocumentKey=190a9553-5a14-4245-a879-4800bd2e764d&MessageKey=b69fd2bf-98c8-491b-92e5-144d05d8140d
It should be noted that neither Astin nor Leyland would agree fully with the suggestions in Chapter 5 of the report as to what a payments-based Household Inflation Index should or should not cover.

[3] The precise wording of clause 21(3) of the Statistics and Registration Service Act 2007 is as follows "If the Bank of England considers that the change constitutes a fundamental change in the index which would be materially detrimental to the interests of the holders of relevant index-linked gilt-edged securities, the Board may not make the change without the consent of the Chancellor of the Exchequer."

Registration Service Act due to specific conditions in pre-2002 index-linked Gilts which will in due course expire (2030). There can, however, be no harm in the UKSA guaranteeing the production of key indices and having a formal and publicised procedure, under the forthcoming governance arrangements for consumer price indices, for agreeing major changes.

**Recommendation 4.** *ONS and the UK Statistics Authority should re-state its position that the RPI is a flawed statistical measure of inflation which should not be used for new purposes and whose use should be discontinued for all purposes unless there are contractual commitments at stake.*

**Recommendation 5**. *Government and regulators should work towards ending the use of the RPI as soon as practicable. Where they decide to keep using it the UK Statistics Authority should ask them to set out clearly and publicly their reasons for doing so. Where the Authority judges the continued use of the RPI to be inappropriate, it should say so.*

**Recommendation 8.** *The logic of the National Statistician's recent decisions is that the RPI should be considered a legacy measure to be used only where contractually required. No further changes should be made to the RPI.*

*If a change is made to the CPI and CPIH that would affect the RPI, the production of the indices should be spilt to retain the best practice of the CPI and HICP and the constancy of the RPI. Over the long term the Authority should look to phase out production of the RPI in consultation with users, amending the law (the Statistics and Registration Service Act 2007) as necessary.*

**Recommendation** 9. *ONS should consult on discontinuing RPIJ. ONS should continue to publish an estimate of the "formula effect" between the RPI and the main measure of inflation*.

We take these four recommendations, with which we largely disagree, together. The following commentary is long in order to cover all the points around the "RPI issue".

It is important to have a full understanding both of what the "problems" with the RPI are and of the extent to which its usage is deeply embedded. We do not believe the report shows a full understanding of either of these. In particular it is a fundamental misunderstanding to assign the formula effect problem entirely to the RPI's use of the Carli. It is also a fundamental misunderstanding to assume that the measurement error that the "formula effect" indicates should all be attributed to an over-estimation of inflation by the RPI rather than an underestimation by the CPI. The truth almost certainly lies in between, but we do not know where.

No index formula is perfect and all have their weaknesses. The art of the statistician lies both in choosing the best index number for the circumstances and in combining the choice of index with appropriate methods of price collecting, sampling, stratification etc. There are arguments which suggest that Carli can in some circumstances provide a superior estimate of price movements to either the Jevons or the Dutot.[4] Nevertheless we accept that it is particularly sensitive to outliers in the upward direction (although less sensitive than some formulae to outliers in the downward direction), as well as the disputed issues around chain drift and price bounce, and that its general

[4] See for example the following papers:
i) Mark Courtney, 2014*, Consumer Price Indices in the UK*, produced unfortunately too late for submission to the Johnson review. Available to download at
http://www.statsusernet.org.uk/communities/resources/viewdocument/?DocumentKey=9292eee6-6191-430a-8299-2abb9ae4ca3c
ii) Jens Mehrhoff, 2010, *Aggregate Indices and Their Corresponding Elementary Indices.*

use in certain circumstances will lead to overestimation, resulting in it giving too high an estimate of inflation.

There is a particular problem with clothing and other "fashion" goods where there are large price swings as new lines are introduced at premium prices and then are subject to often substantial discounting and subsequently replaced by new items introduced at full price. Under present methods of price collection and stratification none of the three main indices – Carli, Jevons and Dutot – will cope adequately. Jevons, used in the CPI family, is sensitive to large price falls as the report also demonstrates and is particularly likely to underestimate inflation in clothing and other fashion goods. We are not aware of any formula which would cope better, so the answer has to be to make other changes, in particular to the price collection structure.

In 2011-12 the ONS carried out some substantial research into the formula effect and the impact of making certain changes. While each change on its own appeared to have limited effect, RSS analysis (made available to the review) demonstrated that combined they would probably make a substantial reduction in the formula effect, with the likelihood of reducing RPI inflation and raising CPI inflation. Plus they would make both indices more accurate.

The report does not mention other potential changes that could reduce the formula effect:

> (I) A change in base month from January to December which is required under EU rules. This was tested over a limited period only and needs to be investigated fully, but the initial results suggested that it might make a reduction in the formula effect.
>
> (2) Expanding the use of Dutot in the CPI to match the same items for which it is used in the RPI and which is permitted by Eurostat HICP regulations. We estimate that this alone would increase the CPI, and reduce the formulae effect, by 0.3 percentage points.
>
> (3) Validation techniques for dealing with outliers may need to be reviewed. Our understanding (which may be out of date) is that in some cases there is an upper cut off point for price relatives but no lower cut off. This is a correct approach for dealing with the Carli, which is sensitive to high price relatives but not to low ones, but the opposite of what is needed for the Jevons where the reverse is the case.

In our view these changes, and any other similar changes implemented, should be made, where relevant, to both the RPI and CPI, as well as being applied to any new indices. Guidance from the Bank of England[5] suggests that such changes, designed to improve the accuracy of the RPI, would not necessarily be considered fundamental or material.

We are strongly opposed to the recommendation that any future potential improvement should only be applied to the CPI family and not to RPI. The RPI will remain an important index for many years to come, due to its use in business contracts, private pensions uprating and index linked bonds. The aim must be to produce it as accurately as possible subject to the constraints of not

[5] Letter from Charles Bean, Deputy Governor, Monetary Policy to Tony Cox, Chair, RPI CPI User Group, 25 March 2013. The letter refers to changes which in the past were not considered fundamental because they were designed to improve the accuracy with which the prices of specific items in the basket are measured. Examples include: the use of better data sources; better imputation of missing price quotes; and better methods of adjustment for quality change (e.g. the use of hedonic pricing). Available at http://www.statsusernet.org.uk/communities/resources/viewdocument/?DocumentKey=1441e930-4dab-481f-96d4-72571ec7c703

being able to make changes that the Bank of England considers to be fundamental and materially detrimental to the interests of holders of index linked bonds.

We also feel that the review does not pay enough attention to the way that the RPI usage is embedded. The majority of private pension schemes still use RPI for uprating purposes; CPI is still relatively rarely used for this purpose. RPI is extensively used in business contracts. Furthermore, it is still, despite the recent attention given to its statistical problems, an index which enjoys a degree of trust. This is not just because it is time honoured, although that is part of it, but also because it was developed explicitly to measure inflation from the perspective of the costs actually faced by households.

We agree that RPI ultimately should be replaced, but this will not be a quick or easy process, nor one that can simply be done by diktat or persuasion. It can only be replaced in public trust and confidence, in our view, by an index which explicitly sets out to do the same thing that RPI was originally intended to do – but which indeed does it demonstrably better than RPI does at the moment. This is one reason, and in our view a powerful one, why an HII based on payments and taking proper recognition of owner occupier housing costs is essential.

We agree that the formulae effect should continue to be published, both in terms of the CPI/RPI differences and also in terms of the RPI/RPIJ differences. We do not believe RPIJ should be discontinued, at least for the moment. In particular it could be a starting point for the development of a Household Inflation Index.

**Recommendation 6.** *ONS should consult users on discontinuing the analytical series it publishes that are based on the RPI, such as the pensioner indices and the Tax and Price Index. Where there is a strong user need for such analyses to continue, the series should be recreated using the CPIH framework.*

We agree that it would be sensible to consult users and to derive these from a "headline" index. However the appropriate index to use would be the HII. Under our proposal pensioner indices and similar could easily form part of the range of indices for different household types. CPI was derived as a macroeconomic index and a macroeconomic index is inherently appropriate for measuring consumer inflation over the household sector as a whole, rather than sub-groups. Where the experience of sub-groups is being explored – and still more, as in the ONS's Personal Inflation Calculator, where individuals are invited to calculate the inflation rate applicable to them – the treatment of housing is particularly important, and nothing other than the payments approach will be able to reflect their different circumstances and experiences.

**Recommendation** 7. *We have noted that producing the CPI and CPIH to the best possible statistical standard is the first priority. The UK Statistics Authority should ensure that this priority is reflected in a work programme for the CPI and CPIH that allows each to be improved with best statistical practice.*

Agreed, but parallel improvements should also be made to the RPI/RPIJ where appropriate (as explained above) and the proposed new HII.

**Recommendation 10**. *ONS should continue its research on producing an experimental superlative index for the UK and should aim to publish such an index annually in arrears once that work is complete and has been fully quality assured.*

We see value in producing an annual superlative index for comparison purposes. At present neither the CPI nor the RPI, are intended to be cost of living indices (COLI). We have mixed views on the desirability of seeking to move price indices towards a best approximation to a COLI in future. A particular concern is that the theory implicit in the usual design of COLIs does not always or entirely match actual consumer behaviour[6].

**Recommendation** 11. *ONS should set out a transparent, regular and frequent process for reviewing which individual items in the basket are collected by local price collectors and which are collected from web sites, catalogues and brochures, to ensure this reflects how different items are purchased in practice.*

**Recommendation** 12. *ONS should review and publish its criteria for choosing how to combine price quotes at the lowest stage of aggregation.*

**Recommendation** 13. *ONS should give priority to developing the use of point of sale scanner data and web scraping techniques. ONS should set out a detailed plan for working towards greater use of these techniques in its consumer price statistics over the coming years.*

We agree with these recommendations. We also urge that ONS be given the powers to request scanner data under the Statistics of Trade Act or some other suitable legal vehicle, rather than having to purchase these data or risk going without.

**Recommendation** 14. *ONS should review the Living Costs and Food Survey (LCF) in light of the need to have good consumption data at a household level both to inform the National Accounts and to help with the creation of reliable estimates of the inflation experience of different population groups. External experts should be involved. More resource should be devoted to the LCF if ONS deems that necessary for the provision of high quality, reliable data on household spending.*

**Recommendation** 15. *ONS should use more than one year of National Accounts data in cases where the weights are particularly volatile, or reflect particular circumstances in the latest year available (such as the weight for gas spending).*

**Recommendation** 16. *ONS should improve its commentary on the weights tables that accompany the RPI and CPIH, so that it explains why weights differ and/or move in different directions in the RPI and CPIH. ONS should aim to publish the annual article on the updated weights at the time the weights change*.

We agree with these recommendations, but we do not regard them as a high priority and they should be implemented as ONS resources permit. Past research has shown that sampling errors in

[6] We also note that Mark Courtney has queried the extent of the difference ONS research found between the CPI and superlative indices. See
http://www.statsusernet.org.uk/communities/alldiscussions1/viewthread/?GroupId=85&MID=2953#bm6
The ONS research can be found in *Calculating a Retrospective Superlative Consumer Prices Index for the UK*
http://www.ons.gov.uk/ons/guide-method/user-guidance/prices/cpi-and-rpi/calculating-a-retrospective-superlative-consumer-prices-index-for-the-uk.pdf

the LCF made only a small contribution to the overall sampling error of the RPI. Furthermore it might be more cost-effective to use 3 year rolling averages of survey data for erratic spending items, as in recommendation 15 relating to national accounts data.

***Recommendation** 17. ONS should review the stratification of consumer price statistics by shop type. The aim should be to introduce an appropriate stratification where weights for the different types of shops are available and can be updated.*

**Recommendation** 18. *ONS should assess the impact of outlet substitution on price indices and, in the light of that work, should consider whether substitution between different outlets (for example, from shops to the internet) should be reflected in any of its statistics.*

We agree and stress the urgency of introducing annual updates of the outlet-type weights and which should include internet only outlets (collected centrally). In outlet substitution, quality change may be as important as any price based substitution, but whatever the reason for the changing consumer patterns they must be reflected in a high quality CPI. This proposed annual update of the shop type weights would adequately take account of all substitution issues for whatever reason. We do not therefore see any need for further modification within years.

**Recommendation** 19. *ONS should introduce regular monitoring of the impact of quality adjustment on its consumer price statistics. This includes monitoring how often non-comparable replacements occur for each item in the basket of goods and services, and investigating those items where this is frequent. ONS should particularly seek to understand cases where the relevant price index deviates substantially from the average price collected.*

Agreed. We are attracted to the idea of widening the interpretation of "comparable" items within each year (as was done for clothing – although perhaps excessively). Arguably the current restrictive replacement system for adding non-comparable items may be artificially lowering the inflation rate. The vacuum cleaner price example in the report suggests that quality adjustment can be overdone. If the public are faced with only a new model vacuum cleaner to buy at a higher price than last month, then they must spend the extra, even if it is, or claims to be, better. This is similar to the point attributed to Leyland on page 65 about forced quality changes faced by consumers.

**Recommendation 20**. *ONS should continue to produce CPIH using "rental equivalence" as the method for calculating owner occupiers housing costs.*

We disagree, for the reasons given in answer to recommendation 1.

**Recommendation 21**. *ONS should produce a full explanation of the difference between the rise in the owner occupiers' housing costs component and the larger rise in private rents measured by the VOA and other sources.*

We agree. We also note the sentence on page 124 "*The legislation governing VOA (the Commissioners of Revenue and Customs Act 2005) does not permit VOA to share microdata with the ONS. Instead, VOA provides aggregated data to ONS, which then uses them to produce price indices of rental housing and hence owner occupiers' housing costs*." ONS should be able to see and check the microdata, otherwise it cannot properly check for quality assurance. This is another example of the need for improvements to the legislation governing access to administrative data by ONS.

**Recommendation 22**. *The UK Statistics Authority should consult on including council tax in CPIH.*

We agree on the desirability of consultation before decisions such as this are made. Council tax is already included in the RPI and in our view it should certainly be included in our proposed HII price index. We have mixed views as to whether it should be included in the CPIH, which would be used primarily for macro-economic purposes. We note that EU rules do not permit its inclusion in the HICP.

**Recommendation 23.** *ONS needs to continue to examine the range and scale of different types of discounting and the extent to which this has been changing over time. It should publish estimates of the likely effects on CPIH of different ways of dealing with these discounts.*

**Recommendation 24**. *ONS should seek to reflect a wider range of discounts, such as multi-buy discounts, in its consumer price statistics, based on the outcome of its studies.*

We agree the need for further research and investigative work. However the treatment of discounts such as BOGOFs ("Buy one get one free"), and "buy the second one half price" is not easy. Such discounts are similar in many ways to buying larger packs and getting a lower price per unit volume. Not all consumers can or wish to purchase larger pack sizes. One key question is whether the use of such non-standard discounts is or is not increasing. This is something that ONS needs to monitor on a recurring basis.

**Additional note.** Surprisingly little was said in the report about the use of consumer price indices for deflation purposes, notably the important need of producing constant price national accounts data. While specialised, this is an important issue; the replacement of RPI by CPI led to a noticeable increase in estimated GDP growth due to the formula effect. The suitability of various consumer price indices for this purpose needs to be examined alongside other needs and any problems or needed improvements noted and acted upon.