

Article

# Consumer price inflation, updating weights: 2020

An overview of the latest annual update of Consumer Prices Index including owner occupiers' housing costs (CPIH) weights.

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# 1 . Introduction

Consumer price inflation is an important indicator of how the UK economy is performing. The [shopping basket](#) of items and their economic importance (or weight) used in compiling the various measures of consumer price inflation<sup>1</sup> are reviewed and updated each year to ensure the indices remain representative of the latest consumer spending patterns.

This article focuses on updates to the weights applied within these baskets.

The second section explains what is meant by a weight and why weights are required.

The third section will explain how weights are calculated in consumer price inflation, defining the data sources and methodology used.

The fourth section will look at the aggregation structure, that is, what level are weights calculated at and where are they used to aggregate through price indices.

Finally, the fifth section will take a look at the latest (2020) set of consumer price inflation weights, and explain any notable movements when comparing with weights used in 2019.

The [tables in Annex A](#) present the latest (February 2020 updated) Consumer Price Indices including owner occupiers' housing costs (CPIH) weights (Table W3) and Consumer Price Indices (CPI) weights (Table W1) from 2005 onwards. The latest Retail Prices Index (RPI) weights (Table W2) are also included for reference.

For reference, [a similar article](#) was also published in March 2019.

This article will primarily focus on the CPIH. Further detail on the methods and process discussed in this article can be found via the [CPIH compendium](#) and the [Consumer Price Indices technical manual](#).

## Notes for: Introduction

1. Namely CPIH, a measure of UK consumer price inflation that include owner-occupiers' housing costs, the Consumer Price Indices (CPI) and the Retail Prices Index (RPI).

# 2 . What is a weight?

Consumer price inflation is the rate at which the prices of goods and services bought by households rise or fall and is estimated by using price indices. One way to understand a price index is to think of a very large shopping basket<sup>1</sup> containing goods and services typically bought by households. The price index estimates changes to the total cost of this basket by calculating the average of price changes of the items within the basket.

However, we know that households spend more on some goods and services than others, so we would expect, for example, a 10% increase in the price of petrol to have a much bigger impact on the basket than a similar rise in the price of tea. For this reason, the components of price indices are weighted using the amount we spend on these items as consumers, to ensure that they reflect the relative importance of the various items in the average shopping basket.

The various weights used in the calculation of consumer price inflation, along with the items that form the “shopping basket” are reviewed and updated each year. This ensures weights remain representative of current household expenditure patterns and reflect the introduction of new items into the shopping basket and removal of old ones. A separate article is published that explains the [annual update to the content of the consumer price inflation basket of goods and services](#).

## Notes for: What is a weight?

1. In reality there are three inflation baskets: for the CPIH, CPI and a basket used by RPI.

## 3 . How do we calculate weights in consumer price indices?

Within Consumer Price Indices including owner occupiers’ housing costs (CPIH) and Consumer Price Indices (CPI), there are four different types of weight:

- central and regional shop weights
- stratum weights
- CPIH and CPI item weights
- [Classification Of Individual Consumption according to Purpose \(COICOP\)](#) weights, for the CPIH and CPI higher-level indices

These bullets are in the order in which the weights are used. The first two types of weights are used to produce the item indices (that is, combining the individual items within the basket), the next is used to combine items into higher-level indices (that is, COICOP-level indices) and the last is used for all levels above this. Aggregation is explained further in Section 4 or via Section 3 of the [technical manual](#).

This article will now focus on the COICOP-level weights. In 2017 a new, additional level of the COICOP classification was introduced. This new level of detail, known as COICOP5 sits between the existing class (or COICOP4)-level indices and item-level indices. Further detail on the impact of introducing this new level of classification can be found in the October 2016 article explaining [methodological improvements on the consumer price indices](#).

## Data sources for CPIH and CPI weights

In consumer price inflation, expenditure weights are designed to reflect the expenditure patterns of the target population of households covered by the index. CPIH and CPI have a different target population to the Retail Prices Index (RPI)<sup>1</sup> and therefore have different expenditure weights, and thus a different source of data underpinning the weight.

The CPIH and CPI cover all expenditure within the UK by:

- private households
- residents of institutions such as university halls of residence or nursing homes
- visitors to the UK from abroad

Information on spending patterns, which underpin the CPIH and CPI weights, largely come from the household final consumption expenditure (HHFCE)<sup>4</sup> component of the UK National Accounts. These data are used because the expenditure information is comprehensive and balanced against data collected in other sectors of the economy to create the most accurate picture of consumer spending. However, there are a few exceptions where additional source data are used to supplement the HHFCE data and improve the coherence with the intended scope of the indices:

- the [Living Costs and Food Survey \(LCF\)](#) is used to supplement HHFCE data in the calculation of weights for air travel, package holidays and actual rentals
- the [International Passenger Survey \(IPS\)](#), which is also used in the calculation of a weight for air travel
- the public sector component of the national accounts, which is used in the calculation of the weight for passport fees

The HHFCE expenditure used in the annual update of CPIH and CPI weights is always the latest calendar year national accounts dataset that is available at the time of weights calculation, that is consistent in methodology with the latest published Blue Book. The annual CPIH and CPI weights update commences in January each year, so the weights are sourced from the latest national accounts update in Quarter 3 (July to Sept) of the preceding year.

For example, for the 2020 weights update, the latest set of HHFCE expenditure was taken from the Quarter 3 2019 national accounts dataset. These data are consistent with the most recent Blue Book release ([Blue Book 2019](#), published in October 2019). In all cases the current price measure (as opposed to the chained volume measure) is used.

Effectively, the 2020 weights are calculated using a more up-to-date version of data in [Table 6.2.14](#) of Blue Book 2019: Individual consumption expenditure at current market prices by households, non-profit institutions serving households and general government: classified by function.

This approach to the use of the latest national accounts data is consistent over time and will remain so in the future.

## Methodology behind the update of COICOP weights and above

Higher-level CPIH and CPI weights (that is, at the COICOP level and above) are updated annually with the January index (published in February), followed by a further update with the February index (published in March) because of the 2017 introduction of [improved methodology](#) (the “double update”) for the production of consumer price inflation, and to coincide with the introduction of new items to the basket of goods and services.

The underlying expenditure in each COICOP grouping is converted to an expenditure share relative to total household expenditure for the overall basket and given an integer weight in parts per thousand so that the sum of the weights equals 1,000.

The weights are based on the latest available calendar year’s HHFCE data; however, these data are not timely enough for immediate use in consumer price indices because of the lag at which national accounts data are published. For example, in Blue Book 2019 the latest available calendar year is 2018. To make the expenditure data as up-to-date as possible, we can restate the expenditure in current prices using a process called price updating.

To explain further: for a given index year  $y$ , the weights are based on the latest available national accounts expenditure from  $y-2$ .

At the first annual update of weights (published with the January index), the expenditure needs to be price updated to December of year  $y-1$ . For the 2020 weights this would mean expenditure from the calendar year 2018 is updated to December 2019 by applying the respective change in price between 2018 and December 2019 (known as the price update factor). This process is applied at the lowest level of COICOP within the weighting structure using the accompanying price movement for that COICOP level in CPIH and CPI (this process is presented in formula in [Annex E](#) of the CPIH compendium).

At the second update of weights, published with the February index, the same underlying 2018 expenditure is updated to January of year  $y$ . So, for the 2020 weights this would mean HHFCE expenditure from the calendar year 2018 is updated to January 2020 by applying the respective change in price between 2018 and January 2020. This approach ensures the latest available expenditure is adjusted so that it is suitable for use in the calculation of consumer price inflation weights. Effectively the same expenditure underpins both the January and February update of weights, with the main difference being the period covered in the price update.

Further details on this double update approach can be found in the October 2016 [methodology article](#) and [Annex E of the CPIH compendium](#).

There are two further aspects of the annual weights update that warrant a mention.

Firstly, when calculating the CPIH and CPI weights for insurance (such as insurance connected with the dwelling, travel, health and transport) an average of the most recent three years expenditure is used in line with international regulation. As insurance expenditure is recorded on a net basis (the difference between expenditure on insurance premiums and the amount paid out in claims) this approach safeguards against exceptional cases where the amount paid out in claims could exceed the amount paid in premiums.

Secondly, the [revisions policy \(PDF, 49KB\)](#) for consumer price statistics means that indices are not usually revised historically. Published weights for consumer price inflation reflect the best available understanding of what households spend their money on in the UK at the time they were produced. Whilst the source data are often revised at a later date, these revisions are not taken into the calculation of weights, that is, only the latest calendar year's data are used in each weights update.

As such, the changes in weights between years may reflect changes in data sources, methods and definitions, as well as changes in spending patterns. For this reason, the weights should not be used to analyse trends in consumer spending over time. Of note in this latest update of weights is the [improvements introduced in the 2019 Blue Book](#). These improvements, in some cases, have led to larger than usual revisions in the latest set of [household final consumption expenditure estimates \(XLS, 1.07MB\)](#) used to underpin the calculation of weights.

## Notes for: How do we calculate weights in consumer price indices?

1. Further details on the RPI can be found in Section 10 of the Consumer Price Indices Technical Manual.
2. [Consumer trends: July to September 2017](#).

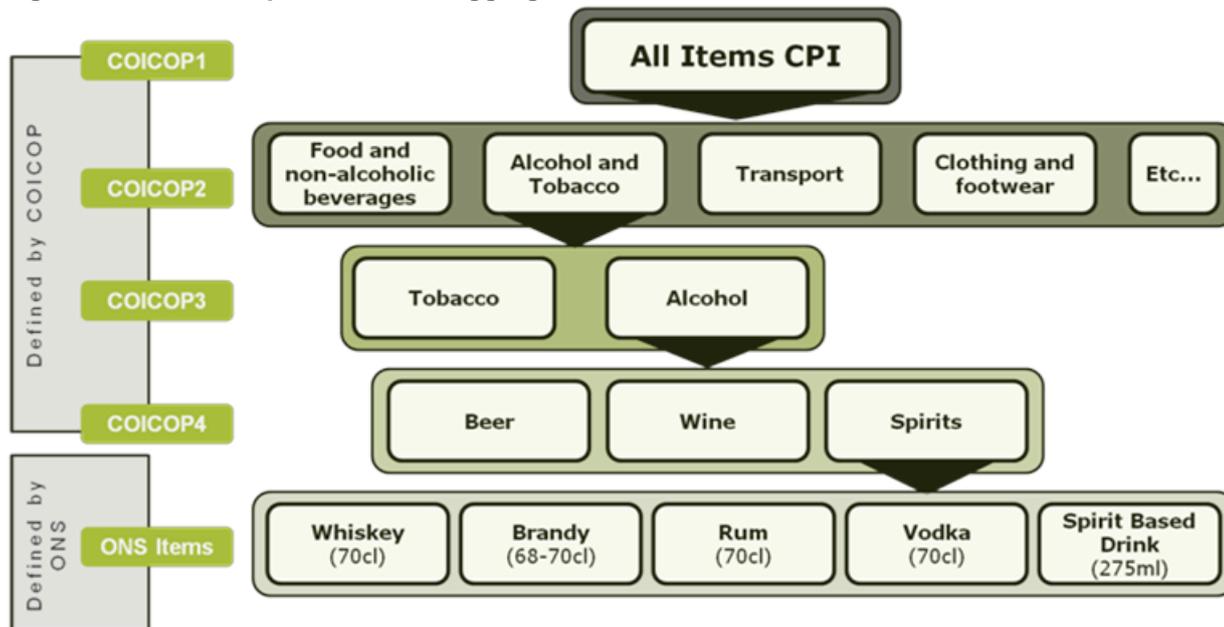
## 4 . The aggregation process in consumer price indices

Having explained how and why weights are calculated in consumer price indices, it is worth defining the various levels of aggregation that weights are used in the production process.

The Consumer Price Indices including owner occupiers' housing costs (CPIH) and Consumer Price Indices (CPI) are classified according to the Classification Of Individual COntsumption by Purpose, commonly referred to as COICOP. This is the international classification of household expenditure and is used in the production of national accounts, Living Costs and Food (LCF) Survey and Consumer Price Indices. COICOP enables the consistent classification of individual consumption expenditure incurred by households, non-profit institutions serving households, and general government according to their purpose.

In previous years (prior to 2017) there were four COICOP levels, with the fourth COICOP level being commonly referred to as "class level" within consumer prices. Items within these levels are aggregated together using expenditure weights up to the first COICOP level – the headline CPIH or CPI.

**Figure 1: Consumer price inflation aggregation structure**

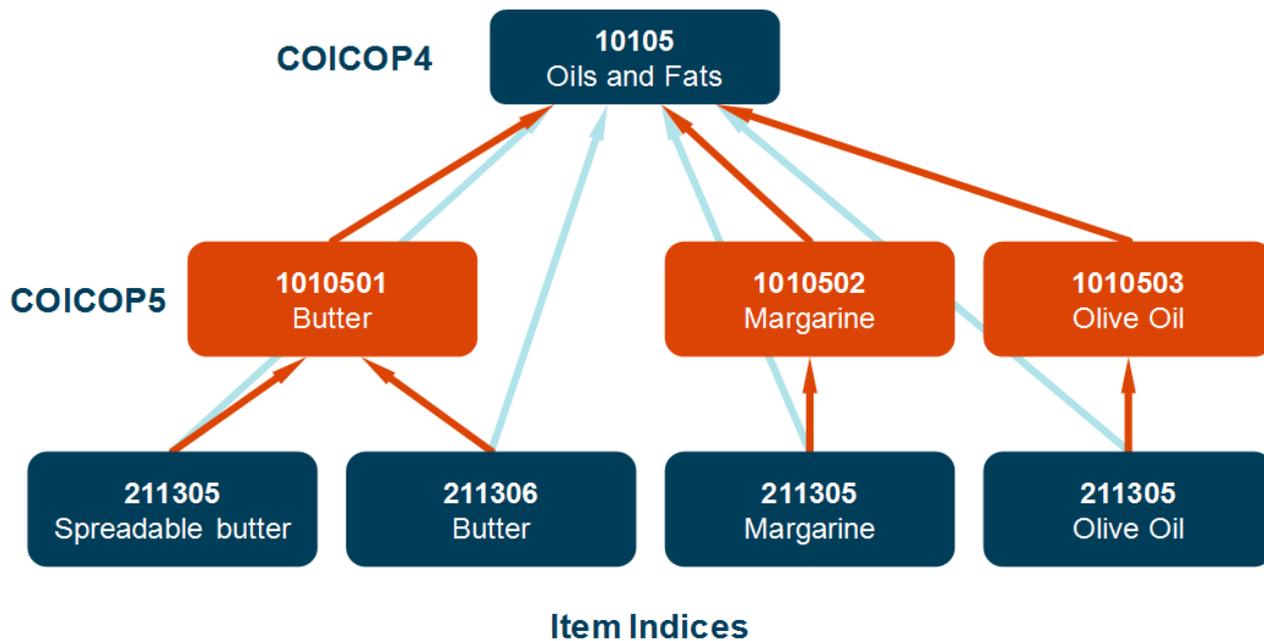


Source: Office for National Statistics

Traditionally the class level (COICOP4) was the first building block of aggregation, however, as of March 2017 a new, more detailed level was introduced into CPIH and CPI aggregation. This new level is referred to as COICOP5 and it sits between the existing COICOP4-level indices and item-level indices.

Effectively the COICOP5 classification has replaced COICOP4 as the first building block of aggregation in consumer price indices and is the level at which household final consumption expenditure (HHFCE) is delivered, price updating of expenditure takes place and COICOP-based weights in consumer price indices are first calculated. Further details on the introduction and impact of COICOP5 in 2017 can be found in the [October 2016 article](#).

Figure 2: The introduction of classification of individual consumption by purpose 5 (COICOP5)



Source: Office for National Statistics

## 5 . Weight changes between 2019 and 2020

This section considers the largest weight changes between 2019 and 2020, focusing on the Consumer Price Indices including owner occupiers' housing costs (CPIH) weights, and explains the reasons for these changes.

These published weights reflect the best available understanding of what households spent their money on at the time the weights were produced. Differences in the weights between years can reflect changes in data sources, methods and definitions, as well as changes in consumer spending in the UK over time. Therefore, these weights should not be used to compare consumer spending over time.

This section will firstly look at the CPIH divisional-level weights ([Classification Of Individual Consumption according to Purpose: COICOP2 level](#)) and drill down through the structure to explain any movements when compared with 2019 by looking at the various COICOP levels. Additionally, any notable lower-level movements are also explained. The tables in [Annex A](#) present the latest (February 2020 updated) CPIH weights (Table W3) and CPI weights (Table W1) down to a class level from 2005 onwards. The latest RPI weights (Table W2) are also included for reference.

### Summary of weight changes

The update of 2020 weights has seen two separate updates, in line with the “double update” methodology introduced in 2017:

- the first update of weights for the January 2020 set of indices, where expenditure for 2018 is price updated to December 2019
- the second update of weights for the February to December 2020 indices, where the expenditure for 2018 is price updated to January 2020

Table 1 presents the CPIH divisional level COICOP weights. The most notable movements will be explained further in this section, firstly focusing on the comparison of January 2020 updated weights with the latest available weights for 2019 (that is, those updated in February 2019 and used for the period February to December 2019) and then explaining any notable change between the January 2020 and February 2020 updated weights. Typically, changes in weight between years can be caused by two factors:

- a change in the underlying expenditure used to calculate the weight
- a change in the price factor applied to price update the expenditure

The change when comparing the February 2020 update against the January 2020 update will be driven by any notable movement in price update factor, which is used to price update the underlying expenditure, whereas any change when comparing the January 2020 updated weight with last year's weights will be because of a combination of changes in expenditure (comparing 2018 expenditure with the expenditure used for 2017) and any notable movement in the price update factor. It is also worth remembering that weights are relative, so any change in weight caused by these factors will cause a relative reallocation of weight elsewhere in the basket.

Table 1: CPIH division-level weights, 2019 to 2020<sup>1</sup>

**parts per thousand**

<b>CPIH Division</b>	<b>2019 weight (ppt)</b>	<b>2020 weight January update (ppt)</b>	<b>2020 weight February update (ppt)</b>
0.1 Food and non-alcoholic beverages	82	79	79
0.2 Alcoholic beverages and tobacco	32	31	32
0.3 Clothing and footwear	54	52	51
0.4 Housing, water, electricity, gas and other fuels	298	295	296
0.5 Furniture, household equipment and maintenance	53	51	50
0.6 Health	22	21	22
0.7 Transport	123	121	120
0.8 Communication	20	17	17
0.9 Recreation and culture	127	136	136
10. Education	18	24	24
11. Restaurants & hotels	97	96	96
12. Miscellaneous goods and services	74	77	77
Total	1000	1000	1000

Source: Office for National Statistics

**Notes:**

1. [A double weights update was introduced in 2017. The first update of weights covers the January period only. The second update covers the period February to December.](#)

There are several divisions with notable movements when comparing the 2020 January updated weights with 2019 weights.

## **Division 01 Food and non-alcoholic beverages**

This division has shown a fall of three parts per thousand (ppt) when comparing the January 2020 updated weight with 2019.

Whilst the fall in weight is spread across most of the component items within this division, the most notable movements are within non-alcoholic beverages:

- the COICOP5 for coffee has seen a fall in weight from 1.83 ppt to 1.18 ppt, this is driven mainly by a fall in the price update ratio used for this COICOP5; this results in the price updated expenditure for the current weights being less than that used in 2019 and hence a fall in weight
- likewise, there is a similar fall for the COICOP5 for tea, which is again driven by a fall in the price update ratio used to update the underlying expenditure

## **Division 04 Housing, water, electricity, gas and other fuels**

This division has shown a fall of three ppt from 298 ppt to 295 ppt when comparing the January 2020 updated weight with 2019. This fall in weight is most notably driven by the component for imputed rents. Whilst the underlying expenditure (and ratio used for price updating) is relatively flat between periods, the fall is caused by a reallocation of weight elsewhere in the basket where more notable changes have taken place. This division then sees an increase of one ppt in the February 2020 update. This has been caused by a very small increase in the price update ratio between the January and February 2020 updates, which has edged the weight up by one ppt.

## **Division 08 Communication**

This division has experienced a fall in weight of three ppt when comparing the January 2020 updated weights with those used in 2019.

At the aggregated level, this division has seen a fall in expenditure underlying the weights calculation of approximately 13% compared with what was used in 2019, although this is mainly driven by improvements made in the national accounts data that underpins the CPIH weights.

Most notably this fall in expenditure affects the component for bundled telecommunication services, which has seen a fall in weight from 8.74 ppt to 7.20 ppt, thus contributing almost half of the fall seen at the divisional level.

## **Division 09 Recreation and culture**

This division has increased in weight by nine ppt from 127 ppt in 2019 to 136 ppt in the January 2020 weights update. This is driven by an increase in the underlying expenditure used in the 2020 weights of approximately 13% when compared with what was used in 2019. As noted previously, a number of improvements were introduced in the 2019 Blue Book, which are having an impact in this division.

The most notable increases in weight within this division, driven by the change in underlying expenditure are:

- the COICOP5 for plants and flowers, which has increased by 1.74 ppt between weights updates
- the COICOP5 for participation at recreational and sporting services, which has increased by 1.66 ppt
- the COICOP5 for cinemas, theatres and concerts, which has increased by 1.04 ppt
- the COICOP5 for television and radio licence fees and subscriptions, which has increased by 1.72 ppt

## **Division 10 Education**

This division has seen a notable increase in weight of six ppt between weights updates. Again, this increase is driven by an increase in the underlying expenditure used in 2020, compared with what was used in 2019 and this is again driven by the improvements introduced in the 2019 national accounts. Within this division, the majority of the increase is driven by the COICOP5 for tertiary education, which has increased by 5.94 ppt between updates.

## **Division 12 Miscellaneous goods and services**

This division has increased in weight by three ppt from 74 ppt in 2019 to 77 ppt in the January 2020 update. At the divisional level, the underlying expenditure underpinning the weights increased by approximately 5% when comparing with what was used last year, again impacted by the improvements in the 2019 national accounts. The most notable increase within this division was in the COICOP5 for childcare services, which increased by 2.78 ppt between updates.

## **Notable movements between the January 2020 and February 2020 update**

This final section focuses on any notable movement in weight between the January 2020 and February 2020 update that have not already been covered previously. Most of the divisions experience small, offsetting change in weight of plus or minus one ppt, which is driven by a change in the price update ratio used at the January and February 2020 updates (where the underlying price index has changed).

As expected, the COICOP5 for international flights has seen a notable fall in weight between the January 2020 and February 2020 updates. The weight has fallen by approximately one ppt. This is driven by the large, seasonal fall in price that air fares experience between December and January each year. This fall in price, which was approximately 18% in January 2020, has led to the fall in weight.

Further information about the construction of the weights can be obtained by contacting:

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