

Article

Relative regional consumer price levels of goods and services, UK: 2016

UK relative regional consumer price levels (RRCPLs) of goods and services for 2016. They provide an indication of a region's price level compared with the UK average. Wales, Northern Ireland, Scotland, London and regions of England have been used in the comparison.

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Table of contents

1. [Main points](#)
2. [Introduction](#)
3. [2016 results](#)
4. [Comparison with 2010 results](#)
5. [Background](#)
6. [Methodology](#)
7. [Price data sources](#)
8. [Weights](#)
9. [Future developments](#)
10. [Annex 1: Supplementary Results](#)
11. [Annex 2: Methodology](#)

1 . Main points

- The UK relative regional consumer price levels (RRCPLs) for 2016 provide an indication of a region's price level compared with the UK average price level.
- In 2016, prices in London were on average 7.0% higher compared with the UK average price level.
- The relative price level of Northern Ireland was the lowest of all the UK regions, having prices that were on average 2.3% lower than the UK as a whole.
- There is little difference in prices for food and non-alcoholic beverages across the different regions, while categories relating to service industries such as restaurants and hotels showed greater price dispersion in 2016.

2 . Introduction

This article presents UK relative regional consumer price levels (RRCPLs) of goods and services for 2016. They are a welcomed by-product of a project conducted by Office for National Statistics (ONS) to calculate UK spatial adjustment factors (SAFs) for [Eurostat](#).

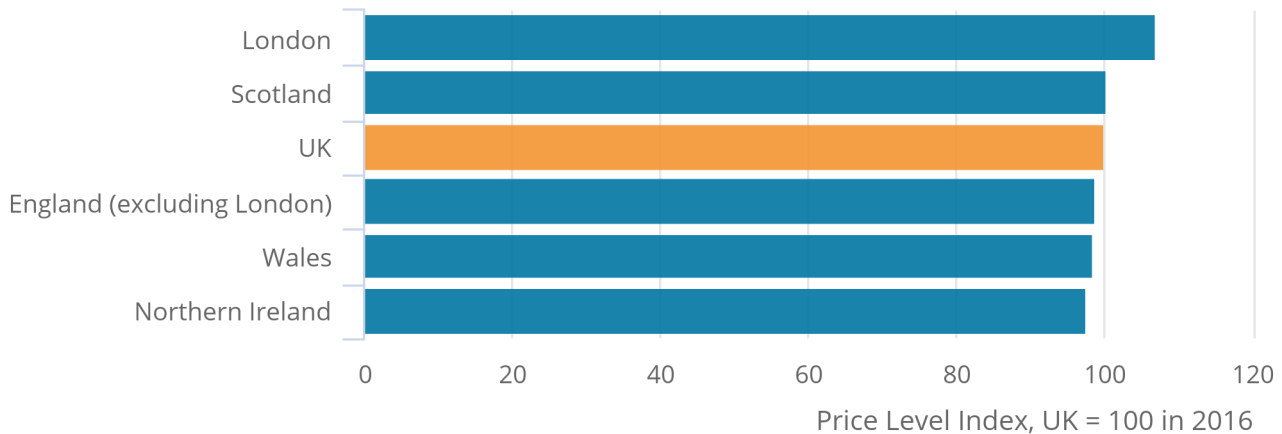
The results in Figure 1 are expressed as price level indices, referred to here as relative regional consumer price levels (RRCPLs). It provides a comparison of a region's price level relative to the national price level where the UK equals 100. Those regions with a RRCPL above 100 are relatively more expensive than the UK average, while the converse is true for those regions with a RRCPL of less than 100.

Figure 1: Regional price level relative to national price level (UK=100)

Constituent regions of the UK, 2016

Figure 1: Regional price level relative to national price level (UK=100)

Constituent regions of the UK, 2016



Source: Office for National Statistics

The 2016 results show that London has the highest overall RRCPL at 107.0, which means that in relative terms, prices are on average 7.0% higher in London compared with the UK average price level, which is set at 100. In comparison, Northern Ireland, at 97.7, has the lowest RRCPL, which means that prices are on average 2.3% lower than the UK average price level. Further analysis of the results, including a breakdown at division level can be found later in this article.

You should note that these spatial price indices do not provide information on price change over time (known as inflation). It is not a time series of prices and therefore it is not possible to compare the results from 2016 with previous results to measure regional price change over time. However, we are also currently researching the feasibility of producing regional inflation rates. For more information please refer to the section Future developments.

The underlying price data for the calculations are derived from three main sources:

- data collected for the Consumer Prices Index (CPI)
- a nationwide regional survey of prices conducted by a contractor on behalf of ONS
- data collected internally by ONS

The data are published at total and division level for five regions: London, England (excluding London), Scotland, Wales and Northern Ireland (refer to Table 1 – Regional price level relative to a national price level (UK equals 100)).

Supplementary data as shown in Annex 1, Table 3 shows a more detailed regional level within England but only at the total aggregate level. This supplementary data should be interpreted with care as the coverage of the data at the more detailed region level is less robust.

3 . 2016 results

Table 1 lists the regional price levels relative to national price level (UK=100) results for five regions at the overall level and Classification of Individual Consumption According to Purpose ([COICOP](#)) division level, which are the 10 main categories that the basket of goods and services is split down into, for example, food and non-alcoholic beverages. At the lowest level, the basket consisted of 539 items, which were comparable across all regions. Only those goods and services purchased for consumption purposes were included in the basket.

Comparability across regions was ensured by having tightly-defined specifications for each of the items in the basket. This was important to make sure that goods and services of the same level of quality were being priced in each of the regions. Prices were collected throughout the UK in order to calculate a representative average price for each region.

London has the highest overall relative regional consumer price level (RRCPL), which is 7.0% above the UK average. This means that prices are on average 7.0% higher in London compared with the UK average price level. With the exception of the communication division, where there is no observed regional variation in price levels, London has the highest RRCPL for all nine divisions, the highest being for recreation and culture, which is 14.8% above the UK average, closely followed by restaurants and hotels, which is 13.0% above the UK average.

Northern Ireland has the lowest overall RRCPL, which is 2.3% below the UK average. This means that prices are on average 2.3% lower in Northern Ireland compared with the UK average price level. Northern Ireland is the only region that has a RRCPL lower than the UK average for all nine divisions (again, with the exception of communication), the lowest being miscellaneous goods and services, where prices are 6.6% below the UK average.

Overall, RRCPLs for England (excluding London) and Scotland, of 98.7 and 100.4 respectively, are close to the UK average, while Wales is 1.5% below the UK average. Scotland has the second highest price levels at total level relative to the UK average.

Table 1: Regional price level relative to national price level (UK=100), 2016

Division	London	England (excluding London)	Scotland	Wales	Northern Ireland
Food & non alcoholic beverages	102.2	97.6	99.8	100.8	99.7
Alcohol & tobacco	103.0	96.8	99.4	102.3	98.6
Clothing and footwear	103.5	101.3	99.2	97.7	98.5
Household & housing services ¹	105.1	98.7	99.7	99.6	97.0
Furniture & household goods	112.2	97.4	103.2	95.5	99.8
Transport	103.3	100.4	99.7	100.6	96.1
Communication	100.0	100.0	100.0	100.0	100.0
Recreation & culture	114.8	96.2	101.4	96.8	95.8
Restaurants & hotels	113.0	97.4	100.4	95.1	98.3
Miscellaneous goods & services	110.5	99.7	104.8	96.2	93.4
All	107.0	98.7	100.4	98.5	97.7

Source: Office for National Statistics

Notes:

1. Excluding rental costs and cost associated with owner occupied housing

At the division level, there is little price dispersion from the UK average for food and non-alcoholic beverages, with the price level for all regions close to the UK average (ranging from 97.6 for England (excluding London) to 102.2 for London). A high proportion of items within this division were affected by the dominance of large retailers who displayed consistency in their pricing across regions. Clothing and footwear is also displaying relatively little price dispersion (ranging from 97.7 for Wales to 103.5 for London). This is closely followed by alcohol and tobacco, with price relatives ranging from 96.8 in England (excluding London) to 103.0 in London.

Greater price dispersion exists in the divisions that include an element of services, including restaurants and hotels, recreation and culture, and miscellaneous goods and services. This reflects the variance in labour expenses in the regions, which make up a large proportion of the total costs in the services industry and also the variability in the cost of renting or leasing outlets across the regions. Durable goods such as furniture and household goods are also demonstrating high price dispersion.

4 . Comparison with 2010 results

We last published [relative regional consumer price levels \(RRCPLs\) for 2010](#) (PDF, 119KB) in July 2011. It is important to note that, as previously mentioned, spatial price indices do not provide information on price change over time. It is not a time series of prices and therefore it is not possible to compare the results of 2016 with 2010 to measure regional price change over time. However, inevitably comparisons will be made and therefore it is important to note that there are a number of differences between the production of the 2010 and 2016 RRCPLs, which increase the difficulty of comparing the two sets of outputs. Such differences include:

- a different set of goods and services included in the RRCPL basket; between the six years the basket of goods and services has evolved to ensure that it is representative of UK consumer spending
- a change in the Classification of Individual Consumption According to Purpose (COICOP) classification between the two outputs resulting in an additional 48 basic headings being used in the 2016 calculations; 120 basic headings in 2010 compared with 168 in 2016; in 2016, a number of basic headings might have been included under one basic heading for 2010, this impacts on the calculations as each basic heading has its own weight
- updating of the weights and population estimates that underpin the calculations
- updating of the location sample

It is important to note that comparisons of the two datasets should be avoided to measure price change over time. It can, however, be used to compare the rank of the RRCPL for each region and how this has changed between the two datasets. For example, Scotland has overtaken England (excluding London) in the ranking at the total or aggregate level.

5 . Background

Eurostat-OECD Purchasing Power Parities Programme

Office for National Statistics (ONS) is required by regulation to participate in the Eurostat-OECD Purchasing Power Parities (PPPs) Programme, which is coordinated by Eurostat in conjunction with the Organisation for Economic Co-operation and Development (OECD).

The Eurostat-OECD PPP Programme requires the collection of prices for a wide range of consumer goods and services in the participating countries for use in the calculation of PPPs. The prices are collected via six consumer surveys over a three-year rolling programme, with two surveys being conducted every year. To limit the costs of collection and resources required, each country is asked to collect “capital city” prices. Therefore, in the case of the UK, London is the chosen city. However, the requirement of the Programme is to calculate national PPPs.

In order to satisfy this requirement for national PPPs, every six years participating countries are required to produce spatial adjustment factors (SAFs), which are used by Eurostat to adjust the prices collected in capital cities to reflect a national average price, in accordance with Regulation (EC) [No 1445/2007](#) (PDF, 138KB) of the European Parliament and of the Council.

In the UK, ONS undertakes this work to produce SAFs to adjust London prices to UK average prices. The resultant national PPPs are not affected by currency differences and can be compared across countries on the same basis. When applied to national accounts information and population data this is a valuable tool in producing comparative measures of economic performance such as gross domestic product (GDP) and actual individual consumption (AIC) per capita across the participating countries.

An important use of the main derived indicator of GDP per capita is the allocation of structural funds within the European Union (EU) to member states. Structural funds were set up to reduce economic disparities between and within member states. The principal indicator determining the eligibility of a region is PPP-deflated intra-country regional GDP per capita. Regions where real GDP per capita is less than 75% of the EU average are eligible for such funds. The UK has been the recipient of such funds.

To enable the UK to produce the SAFs, Eurostat provide funding to ONS to complete an additional UK-wide price collection. A by-product of this work for Eurostat is the production by ONS of relative regional consumer price levels (RRCPLs) of goods and services for the UK, using the same price dataset and similar methodology to that used in the calculation of the UK SAFs.

Although the RRCPLs are an example of a spatial price index, the primary difference in the two outputs is that SAFs provide a UK relative to London coefficient across a wide range of goods and services while RRCPLs produce a series of index numbers that compare the countries (or regions), that is, London, England (excluding London), Wales, Scotland and Northern Ireland to each other at the same point in time. This comparison of prices between geographical locations can be used to determine in which locations goods and services are more expensive or less expensive relative to each other. RRCPLs compare regions in a similar way to Eurostat comparing countries within the Eurostat-OECD PPP programme.

Demand for regional data

In the 2003 Budget, the then Chancellor announced plans to produce regional price indices for the UK. We published our plans for addressing this need later that year in [Developing estimates of relative regional consumer price levels](#) (PDF, 62KB). More recently, regional price data was published in 2011 and now in 2018. Both outputs were produced as a result of the requirement to deliver spatial adjustment factors (SAFs) to Eurostat.

We have responded to user demands for regional price data in recent years:

- 2001 – produced indicative figures for [2000 on the variation in prices between regions](#) (PDF, 46KB) – this was achieved as a by-product of a survey conducted to provide data for the Eurostat-OECD Purchasing Power Parities (PPP) Programme; however, it was noted that the regional data generated from this survey was incomplete and suffered from a number of approximations
- 2004 – [published estimates of 2003 regional price levels](#) (PDF, 97KB) – the 2003 estimates were a partial update of the previous exercise relating to 2000; a survey of regional price levels was not possible in 2003 because of time constraints so in many cases where prices were not available directly from the Retail Prices Index (RPI) they were simply carried forward from the special survey conducted in 2000
- 2005 – [published regional price levels for 2004](#) (PDF, 109KB) – similar to the 2003 estimates, they were based on RPI data, supplemented with a purpose-designed regional price level survey; however, a number of technical improvements were made
- 2011 – [published regional price levels for 2010](#) (PDF, 227KB) – unlike previously published regional data, which were based on RPI data, for 2010 they were based on Consumer Prices Index (CPI) data, supplemented (as for 2004) with a 2010 Regional Price Survey, conducted specifically for use in the calculations of the spatial adjustment factors (funded by Eurostat); the regional prices levels were calculated using the same dataset as the SAFs

We have now produced regional price levels for 2016. It is important to note that comparisons between the 2010 and 2016 datasets should not be made. A limitation of spatial indices is that they do not provide information on price change over time, rather they compare the relative differences in prices at the same point in time between locations, which can be used to determine in which location goods and services are more expensive or less expensive. Such spatial indices cannot provide information on whether the prices of those goods and services have increased or decreased over time. Therefore it is not possible to compare the results of 2016 with 2010 to measure temporal regional price change. For further explanation refer to section Comparison with 2010 results.

In November 2017, ONS commissioned work by Southampton University to conduct a feasibility study into producing a regional CPIH (Consumer Price Index, including owner occupied housing costs). Refer to section Future Developments for further information.

6 . Methodology

Please refer to Annex 2 for information on the methodology used in constructing relative regional consumer price levels (RRCPLs). In summary, the methodology adopted by Office for National Statistics (ONS) is consistent with the approach used by Eurostat in the calculation of the purchasing power parities for the Eurostat-OECD PPP Programme.

7 . Price data sources

Three main data sources for price observations were used in the calculation of the UK relative regional consumer price levels (RRCPLs):

- price observations from the existing monthly Consumer Prices Index collection
- 2016 Regional Price Survey
- centrally (ONS)-collected price observations

It should be noted that this RRCPL dataset is fundamentally the same dataset used for the calculation of the spatial adjustment factors (SAFs) delivered to Eurostat.

Consumer Prices Index data

The use of CPI price data formed an important component of the RRCPL's calculations. CPI data were obtained for approximately a quarter (124) of the items in the basket used in the calculation of the RRCPLs. The majority of the items where CPI data was used were for the food and non-alcoholic beverages, and alcohol and tobacco divisions; for these two divisions just over 50% of the data used were CPI items. These divisions contain items that are well-defined in the CPI item description and which ensure a like-for-like comparison across different regions. A major consideration in choosing items from the CPI basket was their closeness in specification to items in the purchasing power parities (PPP) basket of goods and services. Those CPI items that align very closely to the PPP specification were selected and their existing price observations were included in the dataset.

The prices extracted from the CPI database refer to the 12-month period July 2015 to June 2016 and accounted for approximately 277,500 observations. An average price for the item in each region was calculated for each month. An annual average price was then calculated by taking an unweighted average of the monthly average prices.

2016 Regional Price Survey

A specially-designed UK nationwide survey was conducted to allow for price collection of a basket of consumer goods and services, across sampled locations within the UK. The survey was conducted during the autumn of 2016. Data was collected for 60% of the items in the PPP basket by an external company contracted to conduct this survey on behalf of ONS. This compares with a third of the items in the 2010 Survey.

Trained price collectors were sent to 21 locations across the UK, where they collected approximately 30,500 price observations for 324 items. The majority of these items were from the divisions clothing and footwear, and furniture and household goods. Historically, these are areas where the item specification for the PPPs did not adequately align to the CPI item description and therefore CPI data could not be used. This was in contrast with the divisions of food and non-alcoholic beverages, and alcohol and tobacco where CPI price data was used for over half of the items as they so closely align with PPP descriptions.

Location sample

Three locations were selected per region (Wales, Scotland, Northern Ireland and London), with the exception of England (excluding London) where nine locations were selected in recognition of the size of the region both in terms of expenditure and population. It also ensured that locations in each of the English regions were sampled. Locations were selected using Hotspot analysis techniques and [Retail sales](#) data. This is a different method to the one adopted in the 2010 survey where locations were sampled employing probability proportional to size sampling and using the number of employees in retail employment as a proxy for retail turnover. However, this had minimal impact on the locations sampled and of the 21 locations for both years, 18 remained the same.

With the exception of England (excluding London), an unweighted average price was calculated for each region. For England (excluding London), a weighted average price was calculated using [regional population data](#) to weight together the prices collected across England (excluding London).

Centrally collected data

Data were collected by ONS staff for 17% (91) of items in the basket. The majority of these items collected by ONS were for items that had an element of service. The collection took place at the same time as the Regional Price Survey, in autumn 2016, with prices being obtained either via telephone and/or internet collection.

The majority of items collected centrally were for divisions household services (such as maintenance of house; for example, plumbers and electricians), transport (for example, passenger transport by air and train and coach journeys) and communication (for example, telephone services and internet connection) where prices could be collected via telephone and/or internet (usually where there is no physical outlet). Also items where it was known that national pricing exists such as for newspapers and magazines were collected in-house by ONS.

Average prices were calculated in the same manner as applied to the Regional Price Survey collection.

Special cases

There are several categories of goods and services that required special treatment or exclusion. These are described in this sub-section.

Health and education

Both the health and education categories were excluded from the RRCPL's calculations. This is in line with previous publications. The main reason being that these are services primarily provided to households by general government for the benefit of the individual household. RRCPLs are only concerned with individual consumption expenditure by household and not individual consumption expenditure by government.

Motor vehicles

It is difficult to measure prices paid by the consumer for motor vehicles. Very often, the list price of a motor vehicle is different to the transaction price, with the transaction price being dependent on the negotiation skills of the individual purchaser. Therefore, it was not possible for the price collectors to obtain realistic price observations, so it was assumed no regional price variation for motor vehicles exists. This is in line with current methodology used in the calculation of the PPPs for motor vehicles where the prices delivered to Eurostat are, in the main, list prices.

Property rents and owner occupiers' housing costs

Costs associated with owning, maintaining and living in one's home (for example, depreciation and mortgage interest payments) known as owner occupiers' housing costs (OOH), along with Council Tax were outside of the scope of the spatial adjustment factor (SAF) project and therefore have not been included in the calculation of the RRCPLs.

Property rents were also excluded from the scope of the SAF project and for this reason they too have also not been included in the RRCPL calculations.

National prices

For several goods and services, particularly those available for purchase over the internet, a national pricing policy exists. This means for those particular goods and services, regional price variation does not exist.

National pricing was identified to exist not only for particular items but also for particular retailers and service providers. Where this was the case and the items were sampled, one price was collected and replicated across all five regions. Items included goods such as newspapers and magazines and TV Licences. Since the items that comprise the communication division are dominated by a number of main retailers or service providers that did not exhibit any regional variation in price levels, the price level for this division was set at 100 for all regions (equal to the UK average). This was also confirmed by the prices that were collected for this division of communication, which confirmed no price variation.

8 . Weights

Expenditure data for the calculation of the regional weights for the years 2014 to 2016 were obtained from the Living Costs and Food (LCF) Survey. This is a survey that is conducted annually by Office for National Statistics (ONS). For relative regional consumer price level (RRCPL) purposes the LCF survey provided expenditure by basic heading for each region¹. To smooth the year-to-year volatility that can be seen in such disaggregated data, an average of the regional expenditure for the three years was calculated and used in the aggregation of the RRCPLs. This same approach was used in 2010.

The expenditure weights from the LCF survey were mapped to the basic heading level. With approximately 80 LCF categories, compared with 168 basic headings it was necessary to develop a concordance between the LCF categories and the basic headings. In practice this saw the expenditure weights produced from LCF in some cases divided amongst two or more basic headings. This produced basic heading weights at the region level.

A second stage of aggregation of weights was required for England (excluding London) due to its size. Expenditure weights for England (excluding London) were calculated by using population shares in the different regions of England as a weight.

Analysis of weights

Table 2: Divisional weights by region lists the expenditure weights for ten Classification of Individual Consumption According to Purpose ([COICOP](#)) divisions. This table reflects the breakdown of expenditure in a specific region. For example, the weight for restaurants and hotels is higher in London than it is in Wales demonstrating that in London a greater proportion of the total household expenditure² is devoted to restaurants and hotels than it is in Wales. It does not necessarily indicate that there is more expenditure in one region compared with another.

Table 2: Divisional weights by region (%), 2016

Division	London	England (excluding London)	Scotland	Wales	Northern Ireland
Food & non alcoholic beverages	15.1	15.6	15.5	16.2	16.4
Alcohol & tobacco	2.3	3.2	4.0	3.2	4.0
Clothing and footwear	6.3	6.1	6.0	6.4	9.6
Household & housing services ¹	11.6	11.0	11.6	12.1	9.3
Furniture & household goods	10.1	9.2	8.6	10.2	8.4
Transport	19.4	21.6	22.3	21.1	18.2
Communication	4.2	4.1	3.9	4.3	4.4
Recreation & culture	10.0	10.4	10.2	9.8	9.9
Restaurants & hotels	17.1	14.8	14.1	13.4	15.0
Miscellaneous goods & services	3.9	3.9	3.9	3.3	4.8
Total ²	100.0	100.0	100.0	100.0	100.0

Source: Office for National Statistics

Notes:

1. Excluding rental costs and cost associated with owner occupied housing
2. Divisions may not sum to 100 due to rounding

Overall, transport has the highest expenditure weight in all regions. It accounts for approximately a fifth of total expenditure for all regions. The position of the divisions for second place is food and non-alcoholic beverages for all regions, with the exception of London, which has restaurants and hotels in second place, followed by food and non-alcoholic beverages in third.

Looking at the weights for each region:

- London has the lowest weights for food and non-alcoholic beverages, and alcohol and tobacco, and the highest weight for restaurants and hotels
- England (excluding London) has the highest weight for recreation and culture
- Scotland has the highest weight for transport, and alcohol and tobacco (along with Northern Ireland), and the lowest weight for both communication, and clothing and footwear
- Wales has the lowest weight for recreation and culture, restaurants and hotels, and miscellaneous goods and services, and the highest weights for household and housing services, and furniture and household goods
- Northern Ireland has the highest weight for food and non-alcoholic beverages, alcohol and tobacco (along with Scotland), clothing and footwear, communication, and miscellaneous goods and services; it has the lowest weight for household and housing services, furniture, and household goods and transport

Notes for: Weights

1. Refer to Annex 2: Methodology for more detail on the use of weights in producing RRCPLs.
2. It actually refers to the proportion of total household expenditure that is included in the production of RRCPLs. As mentioned in the section entitled “Special cases”, there are some omissions from total household expenditure in this analysis including owner occupiers’ housing costs, property rents, and health and education.

9 . Future developments

There continues to be a demand for regional price data. A limitation of the approach as contained in this article, is that due to the need to have a large field-based collection to address the areas where Consumer Prices Index (CPI) data is insufficient, it can only reasonably be completed every six years. This is when, as noted previously, Office for National Statistics (ONS) is required to meet its obligations to Eurostat in updating spatial adjustment factors (SAFs).

At the time of writing this article, there are no immediate plans to assess the feasibility and usefulness of developing and publishing annual results for the areas where CPI data can be used for spatial comparison or to produce regional price data more regularly. That said, however, we recently commissioned work by Southampton University to conduct a [feasibility study into producing regional CPIH \(Consumer Prices Index, including owner occupiers’ housing costs\)](#).

It is important to note that these are different from the relative regional consumer price levels (RRCPLs) presented in this article, which show the relative difference in price levels between regions. In comparison, the regional CPIH-consistent (referred to as rCPIH) inflation rates are designed to show price change over time (inflation). The aim of the feasibility study was to investigate the potential for the existing consumer price collections to support the calculation of regional price indices. More specifically, it assesses the feasibility of calculating the CPIH at a regional level for the nine regions of England, and Wales, Scotland and Northern Ireland from existing data.

A reasonable rCPIH measure would provide valuable insight into the nature of how variable inflation rates are within the UK and the potential causes of inter-regional inflation differences. However, the major restriction is whether the currently available data sources lead to sufficiently reliable measures at the regional level.

In brief, the study found that it is possible to construct rCPIH series from the available data sources. The basic patterns in the series are similar to those in the national CPIH. The individual rCPIH differ in ways that could be expected, for example, with London prices increasing at a greater rate than other regions, driven primarily by housing. Although these provisional rCPIH are somewhat useful, the reliability of specific components of the data and procedures are relatively low. Small sample sizes create a great deal of irregularities and uncertainties in the indices as measured by approximate variances, which is the main issue. Therefore although it is feasible to construct regional CPIHs, considerable further development is required to ensure that the rCPIH can reliably represent the inflation within each of the regions.

We will continue to work with Southampton University to progress some of the recommended next steps as outlined in the feasibility study, including investigating the assumptions of the provisional rCPIH such as using national item indices when regional data are not available. Further updates will be published as the work progresses.

10 . Annex 1: Supplementary Results

Table 3 provides relative regional consumer price levels (RRCPLs) for the “all divisions” level for the nine regions of England, plus Scotland, Wales and Northern Ireland. They are also presented in Figure 2. These results are supplementary to the RRCPLs in Table 1 and provide a greater level of detail of price dispersion within England, at the aggregate level. No detail is provided at the disaggregated division level as the quality of the data at this low level of disaggregation is less robust.

Table 3: Supplementary results - Price level relative to the national price level (UK=100) with breakdown of regions of England, 2016

Region	Price Level
London	107.2
South East	101.5
East	99.8
West Midlands	98.5
Scotland	100.4
South West	102.4
East Midlands	99.6
Wales	98.1
North West	98.8
North East	98.8
Northern Ireland	97.6
Yorkshire and the Humber	97.7
UK	100.0

Source: Office for National Statistics

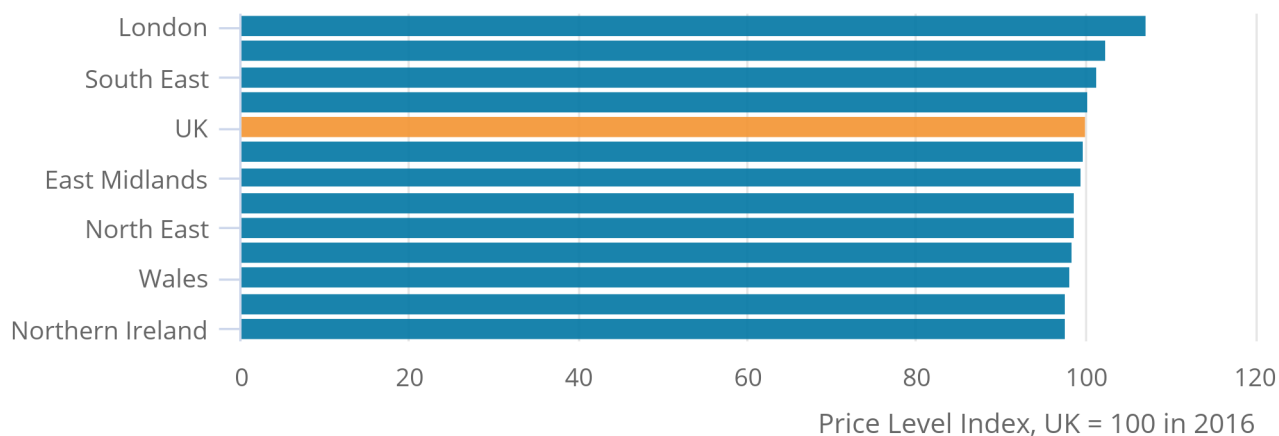
The same underlying data and methodology that were used to produce the RRCPLs in Table 1 have been used for this output. The methodology used means that with the introduction of more regions, the common regions (London, Wales, Scotland and Northern Ireland) can have different values in Table 3 compared with those in Table 1. In this instance by producing 144 unique relativities (as compared with 25) we produce marginally different results to those shown in Table 1. For this reason, the rank of the regions (that is, 1, 2 and 3, and so on), rather than the value of the RRCPLs themselves, should be the focus of the results in Table 3.

Figure 2: Supplementary results - price level relative to national price level (UK=100) with breakdown of regions of England

Constituent regions of the UK , 2016

Figure 2: Supplementary results - price level relative to national price level (UK=100) with breakdown of regions of England

Constituent regions of the UK , 2016



Source: Office for National Statistics

Four regions had a RRCPL higher than the UK average, with London having the highest RRCPL of 107.2, followed by the South West (102.4), South East (101.5) and Scotland (100.4). Regions in the north of England, that is, the North West and the North East have RRCPLs below the UK average, along with the Midlands (East and West), Wales and the East of England. Yorkshire and The Humber and Northern Ireland had the lowest of the regions in the UK with relative prices of 2.3% and 2.4% respectively below the national average.

11 . Annex 2: Methodology

The methodology adopted by Office for National Statistics (ONS) is consistent with the approach used by Eurostat in the calculation of purchasing power parities (PPPs) for the [Eurostat-OECD PPP Programme](#). While relative regional consumer price levels (RRCPLs) compare regions within the UK with each other, the Programme produces PPPs that compare participating countries with each other.

The basic approach to calculating relative regional consumer price levels is to measure the cost of purchasing a common basket of goods and services in each region and express that cost relative to buying the same basket nationally (where the UK equals 100). That is, how much more (or less), relatively speaking, does it cost to buy the basket in one particular region, compared with a UK-average cost for the same basket.

Similar to the Consumer Prices Index (CPI), it is not feasible to collect prices for every type of good and service that consumers spend their money on. Nor is it possible to collect prices from every single outlet or service provider that consumers make purchases from. Therefore, it is necessary to sample for items, locations, outlets and service providers. The main difference compared with the CPI, and important to note, is that regional price level comparisons are designed to compare prices of a common basket of goods and services at one particular point in time, that is, a spatial comparison, in different regions in the UK, whereas the CPI measures the difference in prices of the same basket of goods and services throughout the UK over a period of time, that is, temporal comparison. This is a significant difference that is important to understand. It is important to note that the RRCPLs cannot be compared over time as they are a spatial comparison and not a temporal one.

To be able to compare prices at a particular point in time, it is important to ensure that an identical basket of goods and services is priced for all of the regions. This is critical in developing comparable outputs and ensures that observed price differences in the regions are due to price alone and not influenced by variability in the quality of items priced across regions. For example, a comparison of an observed price of a branded item in one region with the observed price of an unbranded item in another region will reflect in part that the items are not comparable and that unbranded items are typically cheaper.

Having collected observed prices for the goods and services included in the basket, an average price is calculated in each region for each item. Two stages were employed to calculate and aggregate the RRCPLs.

The first stage was below the elementary aggregate level, referred to here as the “basic heading”. Basic headings are the building blocks for the RRCPLs and are the lowest level for which expenditure weights can be obtained. A basic heading comprises a group of similar, well-defined goods or services. In total, 168 basic headings have been defined for this process. A few examples of basic headings are: ladies’ coats and jackets, jewellery, wine, wardrobes and chocolate. Above the basic heading level, RRCPLs were calculated and aggregated using the Classification of Individual Consumption According to Purpose (COICOP) used in the CPI. Regional expenditure was obtained from ONS’s Living Costs and Food Survey and adapted to create regional weights for the 168 basic headings.

As there are no data available on the expenditure on the individual items below a basic heading, a basic heading RRCPL has to be calculated from price data only. Below the basic heading, price relatives for each pair of regions were first calculated; with five regions (London, England (excluding London), Wales, Scotland and Northern Ireland), this resulted in 25 unique price relatives. To combine the price relatives of the items at the basic heading level, an equally-weighted geometric mean of these relatives was calculated for each pair of regions.

Once the RRCPLs had been calculated at the basic heading level, regional weights were used to aggregate the basic headings to successive COICOP levels. For each pair of regions, the basic heading RRCPLs are weighted, summed and averaged using first the expenditures on the basic headings of the first region as weights and then the expenditures on the basic headings of the second region as weights. This gave two weighted RRCPLs: a Laspeyres-like RRCPL and a Paasche-like RRCPL. The geometric mean of these two RRCPLs was then calculated, which produced a single Fisher-like RRCPL between the two regions.

Once each level of aggregation is provided with a matrix of Fisher-like RRCPLs, it was necessary to apply a method to impose transitivity on the Fisher-like RRCPLs. Transitivity is a desirable property for spatial price indices as the same result is obtained when comparing RRCPLs directly between two regions and when comparing the RRCPLs indirectly through the introduction of a third region.

The method used by Eurostat and adopted by ONS to impose transitivity is the EKS (Éltető-Köves-Szulc) method. The RRCPL that results from application of the EKS method (the EKS RRCPL) is defined as the geometric mean of the direct RRCPL and all the indirect RRCPLs between a pair of regions, with the direct RRCPL having twice the weight of each indirect RRCPL. To produce the data in Table 1, England (excluding London) and Wales would need to be compared directly and through London, Scotland and Northern Ireland.

In addition to being transitive, the resulting EKS RRCPLs differ as little as possible from the original Fisher-like RRCPLs. After applying EKS, we are left with a 5x5 matrix of the bilateral EKS RRCPLs. Standardisation of the EKS RRCPLs is required in order to obtain a set of RRCPLs that has the UK as its base. This is done by dividing each RRCPL by the geometric mean of the RRCPL in its column of the matrix. This results in five EKS RRCPLs, one for each region (all the entries in each row have the same value after standardisation), with the UK as the base, where UK equals 100.