

# **Services Producer Price Inflation QMI**

Quality and Methodology Information for the Services Producer Price Index, detailing the strengths and limitations of the data, methods used and data uses and users.

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# 1. Output information

National Statistic	
Survey name	Quarterly Inquiry for Services Producer Price Inflation
Frequency	Quarterly
How compiled	Sample based survey
Geographic coverage	UK
Sample size	Approx. 2,200 businesses
Last revised	20 January 2021

# 2. About this Quality and Methodology Information report

This quality and methodology report contains information on the quality characteristics of the data (including the European Statistical System five dimensions of quality) as well as the methods used to create it.

The information in this report will help you to:

- understand the strengths and limitations of the data
- learn about existing uses and users of the data
- understand the methods used to create the data
- help you to decide suitable uses for the data
- · reduce the risk of misusing data

# 3. Important points

- The Services Producer Price Index (SPPI) provides a measure of inflation for the UK services sector.
- SPPI is constructed from a statutory quarterly survey, which measures changes in the price received for selected services provided by UK businesses.
- The SPPI methods were changed from a five-year rebasing to annual chain-linking, this is a significant improvement to the weighting and linking of the statistics; the first bulletin with the new method was the January 2021 release.
- These individual price indices are also aggregated together to create a services industry SPPI with limited coverage (it does not provide full coverage of the "services sector").
- The Office for National Statistics (ONS) does not currently produce an SPPI for every industry in the services sector and so the SPPI aggregate is a partial, best estimate, of the overall inflation to UK businesses from the services sector.
- The last two quarters are provisional and the last five quarters are subject to revisions.
- Indices with relatively few price quotes (fewer than 5) are classified as F to indicate that these should be treated with caution, for further information on how series are classified see <a href="Accuracy and Reliability">Accuracy and Reliability</a>.
- The UK entered into a new Trade and Co-operation Agreement with the European Union on 1 January 2021; to maintain comparability both over time and internationally, SPPI will currently continue to use Eurostat systems of classification.

# 4. Quality summary

#### **Overview**

The Services Producer Price Index (SPPI) measures inflation in services bought and sold by UK manufacturers. The goods included in SPPI are now based on the Classification by Product Activity (CPA) 2.1, which is maintained by Eurostat. The SPPI covers products from Section G to Section T, however the coverage of prices for these services is currently partial. These prices are then weighted to reflect their relative importance within the index.

This is the first set of SPPI produced with an annual weight update using the <u>annual chain-linking method</u> recommended by <u>Eurostat (PDF, 2.2MB)</u> (further information is in the Recent Improvements section). Previous SPPIs had their weights updated every five years <u>using the rebasing method (PDF, 456KB)</u>.

#### Uses and users

The main users of the SPPI include other areas of the Office for National Statistics (ONS), for instance the national accounts, where SPPIs are used as deflators in the Index of Services (IoS) and the output measure of gross domestic product (GDP). External to ONS, Her Majesty's Treasury (HM Treasury), Bank of England (BoE) and the Department for Business, Energy and Industrial Strategy (BEIS) all use SPPI for purposes such as escalating contracts, monitoring inflation within the services sector and informing on economic policy decisions. SPPIs are also used by private companies and within the Ministry of Defence (MoD) to escalate contracts in line with inflation experienced within the services sector.

User engagement for SPPI is conducted mainly by responding to queries through the dedicated SPPI inbox and by telephone. The views of users are welcomed at any time and this is highlighted in the statistical bulletin and in the signature block of all emails sent from the SPPI inbox. Any feedback received is then used during the process of making any changes or improvements.

Users are consulted ahead of any changes proposed for the SPPI and will be notified of any consultations through the SPPI statistical bulletin, the ONS website and by emailing known users directly.

Meetings are also held directly with main users to seek their feedback and keep them updated of any proposals for change.

## Strengths and limitations

The main strengths of the Services Producer Price Index (SPPI) include:

- the indices are internationally comparable with any country using the CPA or Central Product Classification (CPC) systems
- the indices provide quarterly measures of inflation in the services sector; these can give early indications of inflation trends that can impact consumers
- annually chain-linked series give improved results in deflation by reducing substitution bias

The main limitations of the SPPI include:

- SPPI currently provides a limited coverage of the services sector because of data collection challenges
- SPPI currently uses multiple data sources for its weights and these can be incoherent with one another; additional processing is required to resolve entries that measure the same product but are not consistent with one another
- the SPPI figures are released approximately eight weeks after the end of the quarter to which they relate
- while revisions are kept to a minimum, scheduled revisions are carried out for SPPI and the latest two quarters are marked as provisional

## **Recent improvements**

In 2020, we implemented a significant improvement to the weighting and linking of business inflation statistics. The implementation of <u>chain-linking is recommended by Eurostat (PDF, 2.21MB)</u> over the current method of rebasing for price statistics as the weighting structures are updated more frequently. Further details of chain linking can be found in the <u>chain-linking in business prices article</u> published on 20 July 2020. When we publish the new chain-linked series, there will be a number of other related methodological changes to SPPI.

These changes include:

- the sources used for index weights
- the classification structure of SPPI

The Services Producer Price Index methods changes: July 2020, provides further details on these changes.

# 5. Quality characteristics of the Services Producer Price Index data

This section provides a range of information that describes the quality of the output and details any points that should be noted when using the output.

We have developed <u>guidelines for measuring statistical quality</u>; these are based upon the five European Statistical System (ESS) quality dimensions. This document addresses these quality dimensions and other important quality characteristics, which are:

- relevance
- timeliness and punctuality
- coherence and comparability
- accuracy
- output quality trade-offs
- assessment of user needs and perceptions
- accessibility and clarity

More information is provided about these quality dimensions in upcoming sections.

#### Relevance

(The degree to which the statistical outputs meet users' needs.)

As mentioned in the section <u>uses and users</u>, the Services Producer Price Index (SPPI) has a wide range of users. The recent improvements made to the index aim to better meet their needs.

The SPPI is regulated by the <u>Framework Regulation Integrating Business Statistics</u> (FRIBS) which is maintained by Eurostat. The purpose of these regulations is to ensure comparability across European countries in the production of business prices. A legislative requirement from FRIBS was the move from the bespoke classification system to CPA 2.1. This update will mean that Office for National Statistics (ONS) classification systems are comparable across Europe.

In addition, <u>adopting the annual chain-linking method was recommended by Eurostat (PDF, 2.2MB)</u>. The method used in ONS has been the one-quarter overlap for SPPI. This matches the methods used by member states who have implemented chain-linking and ensures coherence. This therefore supports the needs of Eurostat who use the data for international comparison.

Annual chain-linking of a Laspeyres-Lowe type index is also beneficial for the purpose of users in National Accounts where SPPI is used for deflation. The chain-linked method gives an improved outcome to deflation compared with the five-year rebased SPPI. It also has some similar properties to using a Fisher Price Index, which is often considered the gold standard in deflation.

Finally, the more frequent update of weights also brings benefits to users who use the indices for the measurement of inflation. This is because the economic importance of different products is being more regularly updated. This can give more up to date information on changes in the economy.

### **Accuracy and reliability**

(The degree of closeness between an estimate and the true value.)

Estimates from the Services Producer Price Index (SPPI) are subject to various sources of error. The total error consists of two elements, the sampling error and the non-sampling error.

#### Sampling error

This occurs because estimates are based on a sample rather than a census; the precision is usually estimated through the calculation of standard errors. <u>Standard errors for SPPI</u> releases are available.

The sample allocation is reviewed annually to maximise optimality with the available resources. This occurs on SPPI as part of the sample design process.

#### Non-sampling error

Non-sampling errors are not easy to quantify and include errors of coverage, measurement processing and non-response.

Various procedures are in place to ensure that errors are minimised. Validation checks on data, based on percentage movements from month to month and year to year, are conducted to highlight unusual price changes for items. Disparities in data are investigated by contacting the contributor.

Quality issues such as specification changes are also routinely assessed together with any indices which move more than 5%.

Another aspect of quality is reliability. Assessing the difference between the first published estimate and the final revised figure provides an indication of reliability. We also publish information on the <a href="SPPI revisions policy">SPPI revisions policy</a> and revision triangles.

The SPPI policy is to show significant revisions, but to suppress minor changes to avoid unnecessary inconvenience to users. Indices for the most recent two quarters are shown as provisional and can be changed as later data become available. The latest five quarters are subject to revisions in light of late and revised contributor data.

Indices where product coverage is of less than 70% or contributor coverage is of less than 30% are classified as B, indicating a lower level of reliability. Indices with relatively few quotes (fewer than five) are classified as F and therefore should be treated with caution. Indices with respondent coverage of 30% or more are classified as A.

# Coherence and comparability

(Coherence is the degree to which data that are derived from different sources or methods, but refer to the same topic, are similar. Comparability is the degree to which data can be compared over time and domain, for example, the geographic level.)

#### **Prices**

Comparable <u>time series</u>, in some cases available back to the year 1996, can be downloaded, though this varies depending on the date at which the index was published.

#### Sales data

Sales data for SPPI are collected from the Annual Survey of Goods and Services (ASGS) and the Annual Business Survey (ABS). Additional data processing is required to ensure that the final sales datasets used to calculate weights are coherent. For further detail on the processing that is carried out on the sales data see Services Producer Price Index methods changes: July 2020.

#### International

All European Union countries are required to produce SPPIs and submit them to Eurostat under the Short-Term Business Statistics Regulation. While the coverage of various sectors may not be equal in all countries (that is, not all countries cover the same services industries), the use of the European classification Nomenclature statistique des activités économiques dans la Communauté européenne (NACE) (implemented as the Standard Industrial Classification 2007: SIC 2007 in the UK) ensures that all activities are measured in a way that allows comparability across Europe. Furthermore, since NACE is based on the United Nations International Standard Industrial Classification of All Economic Activities, Rev.4 (ISIC Rev.4), SPPIs are broadly comparable internationally.

#### Price indices published by ONS

ONS publishes the Producer Price Indices (PPI) which measures business price inflation but is focused on manufactured products. In indices up to 2019 the SPPI was calculated on a business to business basis. That is, consumer transactions were excluded from the weights and prices. This contrasts with the PPI, which includes consumer transactions for this period. However, in practice these account for a negligible proportion of the PPI. Both the PPI and SPPI are now published on a [Classification by product Activity](https://ec.europa.eu/eurostat /statistics-explained/index.php/Glossary:Statistical\_classification\_of\_products\_by\_activity\_(CPA)) (CPA) 2.1 basis and are annually chain-linked.

In addition, ONS publishes several consumer-focused price indices. These are the Retail Price Index (RPI), the Consumer Prices Index (CPI) and Consumer Price Index including owner occupiers' housing costs (CPIH). The major difference between the SPPI and consumer focused price indices is perspective. Business prices measure prices from the point of view of the service provider, for example, the price a service provider would ask other businesses, government and from 2019, consumers for their product. The Consumer Price Indices would measure how much a consumer would pay for this product when buying it (as such the margins included in the price would be different). SPPI can therefore act as an early indication of inflation on the consumer price statistics as an increase in the price charged by the service provider can translate to an increased price for consumers. There is further detail on how the Consumer Price Indices are calculated in the Consumer Price Inflation QMI.

# Accessibility and clarity

Accessibility is the ease with which users are able to access the data, also reflecting the format in which the data are available and the availability of supporting information. Clarity refers to the quality and sufficiency of the release details, illustrations and accompanying advice.

Our recommended format for accessible content is a combination of HTML web pages for narrative, charts and graphs, with data being provided in usable formats such as CSV and Excel. Our website also offers users the option to download the narrative in PDF. In some instances other software may be used, or may be available on request. Available formats for content published on our website but not produced by us, or referenced on our website but stored elsewhere, may vary. For further information please refer to the contact details at the beginning of this report.

The latest SPPI <u>statistical bulletin</u>, with accompanying tables, can be downloaded from our website on the day of publication. <u>Time series data</u>, containing complete data series, are also available for download.

General enquiries about the SPPI series data, compilation methods, development articles, quality information or difficulties in finding the latest figures can be emailed to the SPPI team at business.prices@ons.gov.uk.

For information regarding conditions of access to data, please refer to the links:

- terms and conditions (for data on the website)
- copyright and reuse of published data
- accessibility

In addition to this Quality and Methodology Information, basic quality information relevant to each release is available in the Quality and methodology notes of the relevant SPPI statistical bulletin.

### **Timeliness and punctuality**

The Services Producer Price Index (SPPI) is published quarterly with approximately eight weeks between publication and the reference quarter to which the data refer.

For more details on related releases, <u>our release calendar</u> provides 12 months' advance notice of release dates. If there are any changes to the pre-announced release schedule, public attention will be drawn to the change and the reasons for the change will be explained fully at the same time, as set out in the <u>Code of Practice for Official Statistics</u>.

From Quarter 3 2020 (July to September) the SPPI bulletin has been combined with the <u>bulletin for the Producer</u> <u>Price Index (PPI)</u>.

# Concepts and definitions (including list of changes to definitions)

(Concepts and definitions describe the legislation governing the output and a description of the classifications used in the output.)

The provision of quarterly Services Producer Price Index (SPPI) data was required by Eurostat under the Short-Term Business Statistics Regulation. The collection of SPPI data is governed by the Statistics of Trade Act 1947. This ensures that it is mandatory for businesses within Great Britain to provide data. The structure of the SPPI is defined by the European classification of products by activity (CPA). Earlier versions of the SPPI used a bespoke classification designed by sector experts, where the industry level was broadly comparable to the Standard Industrial Classification (SIC). In line with Eurostat requirements, this has been updated to CPA 2.1. These changes mean that the prices are now grouped differently to the former series. Consequently, the new published series will not be directly comparable to previous series. For further detail on the classification changes and how these affect the series see Services Producer Price Index methods changes.

From 2019, the scope of the SPPI has been extended to cover "business-to-all" transactions. That is, including transactions to consumers (households) as a result of adopting new European legislative requirements within the <a href="Framework Regulation Integrating Business Statistics">Framework Regulation Integrating Business Statistics</a> (FRIBS). It is important to note that up to 2019 the SPPI was a business-to-business (B2B) survey and development is continuing on the collection of business-to-all (B2A) prices. For further information please see <a href="Improvements to the Import and Export Price Indices">Improvements to the Import and Export Price Indices</a> (IPI and EPI) and Services Producer Price Indices (SPPI) and Services Producer Price Index methods changes.

### Geography (including list of changes to boundaries)

Services Producer Price Index (SPPI) estimates are produced routinely on a quarterly basis by the Office for National Statistics (ONS) at the UK level. These cover services producers who sell services within the UK.

### 6. Methods used to produce the SPPI data

#### How we collect the data, main data sources and accuracy

There are two main types of data used in the calculation of the Services Producer Price Index (SPPI). These are the prices quoted by manufacturers for their products and the sales values that are used to provide a weight for the prices.

#### Price data collection

Prices for services representative of specified UK services industries are collected on a quarterly basis. The movements in these prices are weighted together, to reflect their importance within the relevant services industry and aggregated into a price index.

As part of the SPPI improvement work that commenced in May 2017 sample coverage was broadened to include transactions between businesses and all customers in Northern Ireland. This work was fully implemented at the end 2019.

The majority of price collection is carried out by the Office for National Statistics (ONS) using postal questionnaires sent to respondents, though a number are compiled from administrative data provided by third parties. These indices are:

- repair of motor vehicles Retail Prices Index (RPI)
- sewerage services The Water Services Regulation Authority (Ofwat)
- rail fares Office of Rail Regulation (ORR)
- real estate Investment PropertyDatabank (IPD)
- banking Bank of England (BoE)
- telecommunications Office of Communications (Ofcom)
- national post parcels Parcelforce

Information about the statistical use of administrative data can be found on our website: <u>Statement of administrative sources</u>. The <u>Statistical Office of the European Communities (Eurostat)</u> requires the provision of quarterly SPPI data under the <u>short-term business statistics regulation</u>.

#### Sales data collection

The chain-linked Services Producer Price Index (SPPI) has had a change in the sources used compared with the rebased version. Sales data are gathered from the Annual Business Survey (ABS) and Annual Survey of Goods and Services (ASGS) to ensure full coverage and representativeness of all service product groups. These are all price updated before being used as weights in SPPI. The rebased SPPI used a combination of the Services Turnover Survey (STS) and ABS.

#### Annual Survey of Goods and Services (ASGS)

The ASGS is a new annual survey that focuses on collecting the turnover of service products. It has been designed to be the service sector equivalent of the <u>UK manufactures' sales by product (ProdCom) survey</u>, which provides product-level sales data for manufactured goods. The first available year of ASGS data was 2016, which had a sample size of 40,000 businesses and collected turnover for 1,200 service products.

#### **ABS**

The Annual Business Survey (ABS) is a sample survey that collects annual sales data for UK businesses across the whole economy and was also used during the last rebasing exercise. ABS data are used to fill gaps in ASGS coverage.

## How we process the data

The methodology used to produce the SPPI indices is detailed in the series of papers on <u>Chain-linking in business</u> <u>prices</u>. A summary of that methodology is provided here.

Our aim is to construct indices that track producer price movements at a number of different levels of detail in the service sector. We collect price data for many service products. These are combined to form an index that measures the price behaviour of broader groupings of products, for example, those produced by an entire industry (in SPPI). The way we do this is by making higher level indices weighted averages of these prices we collect.

These are price indices, or aggregates. Above the lowest level of detail, our price indices are weighted averages of lower level indices. For example, an index for electronic equipment is a weighted average of the price indices for more detailed product groupings within electronic equipment. Let's assume that the only two product groupings within electronic equipment are mobile phones and computers. The index for it should therefore be a weighted average of the indices for mobile phones and computers.

From the January 2021 bulletin, SPPI has used annual chain linking methodology. In this method the weights are annually updated rather than changed every five years as in the previous rebasing method. However, the weights are collected at a three-year lag to the index being calculated. These are then updated to reflect prices in the reference period, which for the SPPI is Quarter 4 (Oct to Dec) for the year before the index being calculated (that is, the index for Quarter 1 (Jan to Mar) 2020 will use Quarter 4 2019 as the reference period).

#### How we analyse and interpret the data

To ensure that the SPPI results are accurate, analysis checks are carried out on the data following provisional results (pre-calc) and final results (main-calc) before being published in the quarterly statistical bulletin and accompanying datasets.

At each calc run, the system calculates index values for the current quarter and re-calculates the index values for the previous four quarters. Indices with percentage changes over 7.5% are highlighted in the generated prints and investigated by the production analyst. Pre-calc is a provisional result run of the index values in preparation for the main-calc. It gives the production analyst an early opportunity to see any movement on the index, reasons for the movement, and to raise any queries with the Prices team. It also allows any errors to be identified and corrected prior to main-calc. Main-calc follows the same process. Occasionally, it is necessary to recalculate some indices at results stage and if new prices were inserted, index values that had already been checked and recorded would change. This is only carried out under authority from the publication manager and requires another main-calc to be run.

Following these analytical checks, the publication team prepare the charts, tables and datasets for inclusion in the statistical release. The team hold a "curiosity" meeting to discuss figures prior to the production analyst writing the statistical bulletin.

### How we quality assure and validate the data

Rigorous quality assurance is carried out at all stages of production.

The quarterly movements for each price are validated using specified "gates". Any quarterly movement outside of negative 7.5 and positive 7.5 per cent is regarded as a "dubious" price movement. This price is confirmed with the contributor and details of the conversation and the reasons behind the price change are noted on the system. A quarterly movement outside of negative 25 and positive 25 per cent is regarded as an "incredible" price movement. These are queried in the same way as dubious prices but, unlike dubious prices, these prices will need to be specifically confirmed on the system before the system will use them as part of the price index calculation.

#### How we disseminate the data

The aggregate level SPPI, section level and Industry level SPPIs are published on a quarterly basis. Data below industry level are not made available, as the sample is not optimised to produce publishable data at this level.

The latest SPPI <u>statistical bulletin</u>, with accompanying tables, can be downloaded on the day of publication. <u>Time series data</u>, containing complete data series, are also available for download. Future publication dates can be found in the <u>release calendar</u>.

#### How we review and maintain the data processes

The Services Producer Price Index (SPPI) policy is to show significant revisions, but to suppress minor changes to avoid unnecessary inconvenience to users. Indices for the most recent two quarters are shown as provisional and can be changed as later data become available. The latest five quarters are subject to revisions in light of late and revised contributor data.

# 6. Methods used to produce the SPPI data

### **Accuracy**

The degree of closeness between an estimate and the true value.

The index is subject to a number of potential sources of error, which may affect the accuracy of the indices.

### Non-response and imputation error

Non-response error occurs where the responses of respondents differ from the potential responses of non-respondents.

As a quality assurance method, all SPPIs target a response rate of at least 78% for the first quarter in which they are published. In the second quarter 90% is targeted. This ensures that all service product groups have a sufficient number of price quotes when price movements are calculated. This practice also ensures that where imputations are calculated for non-response data, they are based on as much available information as possible.

# Sampling error

Since a sample doesn't include all the members of a population, statistics gathered from that sample generally differ from those that would be gathered from the entire population. Since the intention is to use the sample to determine information about the population, these differences are called sampling errors.

Sampling errors are usually estimated through the calculation of standard errors. These are not currently calculated for the SPPI, so it is not possible to estimate the sampling error affecting the index. We plan to introduce the annual calculation of standard errors for SPPI over the next 12 months to provide users with this estimation.

# Coverage error

The existing SPPI sample was drawn from the IDBR. This is not an ideal sampling frame for the SPPI, as it does not provide information on business-to-business service transactions or the particular services provided by each business. This means that when samples are drawn, they often include inappropriate units, or units that should be available for selection are not in the scope of the sampling frame.

The sample improvement work starting in May 2017 will use the STS as a sampling frame. It is expected that the samples drawn using this method will be more representative than those drawn from the IDBR.

#### **Processing error**

A processing error is one that arises from the faulty implementation of a correctly planned methodology. In the SPPI this is mostly minimised by the use of the automated data take on system. This scans the questionnaires received and automatically transfers the data to the system. There are, however, occasions where the scanner cannot interpret the data. Where this occurs the data are manually entered onto the system, creating the potential for data to be entered incorrectly.

Quality or specification changes can also lead to error, as these currently have to be manually handled on a case-by-case basis, usually with the resulting adjustment having to be calculated based on the best evidence available.

#### **Revisions**

The SPPI is subject to revisions. For the most part, the revisions shown in the SPPI are within the "spectrum" periods. This spectrum is 5 quarters long and data are subject to revisions for this length of time.

If late prices are received that have a significant effect on the index, it is possible that these figures could be revised outside of the spectrum periods. Such an event is rare and would only be done where the effect on users is justified by the impact of the revision.

### Coherence and comparability

Coherence is the degree to which data that are derived from different sources or methods, but refer to the same topic, are similar. Comparability is the degree to which data can be compared over time and domain, for example, the geographic level.

All European Union countries are required to produce SPPIs and submit them to Eurostat under the Short-Term Business Statistics Regulation. While the coverage of various sectors may not be equal in all countries (that is, not all countries cover the same services industries), the use of the European classification Nomenclature statistique des activités économiques dans la Communauté européenne (NACE) (implemented as the Standard Industrial Classification 2007: SIC 2007 in the UK) ensures that all activities are measured in a way that allows comparability across Europe. Furthermore, since NACE is based on the United Nations International Standard Industrial Classification of All Economic Activities, Rev.4 (ISIC Rev. 4), SPPIs are broadly comparable internationally.

The SPPI measures price change in industries that are also covered by the Consumer Prices Index (CPI). The results of these indices will often vary, due to conceptual differences in what the indices are trying to measure. The CPI measures the change in prices paid by consumers for goods and services, while the SPPI measures the price received by UK services providers when providing a service to another UK business or UK government. This is the main difference between the indices, though it should also be noted that the CPI is produced using a chain-linking methodology. This ensures that their weights are updated every year, rather than every 5 years for the SPPI. This difference is another potential source of variation between the indices.

Comparable <u>time series</u>, in some cases available back to the year 1996, can be downloaded, though this varies depending on the date at which the index was developed and published.

# 7. Other information

To read about the five-yearly rebasing method in greater detail see the <u>Services Producer Price Index methods</u> and <u>guidance from 2015 (PDF, 456KB)</u>.

There is guidance on using indices in indexation clauses is available in the <u>SPPI rebasing 2010 questions and answers document</u> and the <u>guidance on using indices in indexation clauses (PDF, 197 KB)</u>. This relates to the former rebasing method but the calculation remains the same.

To read about the change in methods to chain-linking see Chain-linking in business prices.

Further information about the changes in methods to SPPI are available in the <u>Services Producer Price Index</u> <u>methods changes</u>.