

Producer price indices QMI

Quality and Methodology Information (QMI) report for the 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	Three statutory monthly surveys
Frequency	Monthly
How compiled	Sample-based surveys
Geographic coverage	UK

2 . About this Quality and Methodology Information report

This Quality and Methodology Information (QMI) report contains information on the quality characteristics of the data (including the European Statistical System's 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
- decide suitable uses for the data
- reduce the risk of misusing the data

3 . Important points

- The Producer Price Indices (PPIs) are a set of monthly surveys that measure the price changes of goods bought and sold by UK manufacturers.
- The PPIs methods were changed from a five-year rebasing to annual chain-linking; this is an improvement to the weighting and linking of the statistics, and the first bulletin with the new method is the November 2020 release.
- Headline PPI has moved from net to gross sector output and now excludes duty; this change affects the November 2020 bulletin onwards.
- Headline PPI has moved from net to gross sector input; this change affects the November 2020 bulletin onwards.
- The PPIs provide an important measure of inflation.
- The factory gate price (the output price) is the price of goods sold by UK manufacturers; it includes costs such as labour, raw materials and energy as well as interest on loans, site or building maintenance, and rent, but it excludes taxes.
- The input price indices measure change in the prices of materials and fuels bought by UK manufacturers for processing; these include materials used in the final product and by the company in its normal day-to-day running.
- The last two months of data are provisional with the last 12 months being subject to revisions.
- Indices with fewer than five quotes are classified as F and should therefore be treated with caution.

4 . Quality summary

Overview

The Producer Price Indices (PPIs) are a collection of price indices that measure inflation in goods bought and sold by UK manufacturers. The indices are split into the Producer Price Index (PPI), Export Price Index (EPI) and Import Price Index (IPI).

The goods included in the PPIs are based on the classification by product activity (CPA) 2.1, which is maintained by Eurostat. The PPIs cover products from sections A to E. The prices for goods are then weighted to reflect their relative importance within the index. This is the first set of PPIs produced with an annual weight update using the [annual chain-linking method recommended by Eurostat](#) (see the Recent improvements subsection for further information). Previous PPIs had their weights updated every five years using [the rebasing method \(PDF, 1.14MB\)](#).

There are two main types of PPI:

- gross sector output – these are the factory gate prices of the finished manufactured product sold to a third party customer (this can include other manufacturers)
- gross sector input – these are the prices that manufacturers pay for materials used in the manufacturing process (these can be provided by any sector or through imports)

Uses and users

The PPIs have a number of users both within and outside of government. Within the Office for National Statistics (ONS), the PPIs are mainly used by UK National Accounts as a deflator in the Index of Production (IoP) and gross domestic product (GDP). Exports are used to deflate the export component of the IoP as well as the value of exports of manufactured goods recorded in the balance of payments.

Externally, the Bank of England (BoE), HM Treasury (HMT) and business economists at City institutions regard the PPIs as a measure of current inflationary process in the overall economy. The Department for Business, Innovation and Skills (BIS), HM Revenue and Customs (HMRC) and industrial economists also use PPIs for monitoring price pressures in sub-sectors of UK industry.

Commercial customers, including the Ministry of Defence (MoD) and its suppliers, use the indices as an impartial measure of prices for contractual purposes and for comparing their own patterns of purchases and sales. The PPIs are also used to produce industry specific indices for use in contract escalation. For example, the British Electrotechnical and Allied Manufacturers Association (Beama) and the Building Cost Information Service (BCIS) produce bespoke indices for their members for electrical engineering and construction industries respectively.

Domestic PPIs, the EU EPIs and the IPIs are used by Eurostat along with PPIs of other EU member states.

Strengths and limitations

The main strengths of the PPIs include:

- the PPIs have a wide coverage of manufactured goods used in the UK market; PPI covers the prices of products from [section A to section E36 within the CPA](#)
- the indices are internationally comparable with any country using the CPA or Central Product Classification (CPC) systems
- the indices provide timely monthly measures of inflation in the production sector; these can give early indications of inflation trends that can impact consumers
- a wide range of indices are available measuring different aspects of manufacturing sector prices are available, for example, input and output prices, trade prices, and bespoke aggregations
- annually chain-linked series give improved results in deflation by reducing substitution bias
- use of rotational sampling for the PPI enables new products and new respondents to be captured

The main limitations of the PPI include:

- the trade indices (EPI and IPI) have more limited coverage of prices because of data collection challenges; these index values have more frequent instances of imputation
- the PPI uses multiple data sources for its weights; these are collected from different sources and can therefore be incoherent with one another – additional processing is required in some cases to resolve entries that measure the same product but are not consistent with one another

Recent improvements

In 2020, we implemented a significant improvement to the weighting and linking of business inflation statistics. The implementation of [chain-linking is recommended by Eurostat](#) 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 [Chain-linking in business prices article](#) published on 20 July 2020. When we publish the new chain-linked series, there will be a number of other related methodological changes to the PPI, EPI and IPI, including in the definitions of our headline figures.

These changes include:

- the move from a net to a gross basis to measure headline producer inflation
- the removal of duty
- changes in the weight's sources

[PPIs methods changes](#) provides further details on these changes.

5 . Quality characteristics of the PPI 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 [Guidelines for measuring statistical quality](#); these are based on the European Statistical System's five dimensions of quality. 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 subsections.

Relevance

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

As mentioned in the subsection Uses and users, the Producer Price Indices (PPIs) have a wide range of users. The recent improvements made to the index aim to better meet their needs.

The PPIs are regulated by the [Framework Regulation Integrating Business Statistics \(FRIBS\)](#), 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 updating the statistical classification of products by activity (CPA) structure from CPA 08 to CPA 2.1. This update will mean that Office for National Statistics (ONS) classification systems are comparable across Europe.

In addition, [adopting the annual chain-linking method was recommended by Eurostat](#). The method used in the ONS has been the one-month overlap for the PPIs. This matches the methods used by other member states that have implemented chain-linking and ensures coherence. This therefore supports the needs of Eurostat, which 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 the PPIs are used for deflation. The chain-linked method gives an improved outcome to deflation compared with the five-year rebased PPIs. 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 PPIs are subject to various sources of error. The total error consists of two elements: the sampling error and the non-sampling error.

Sampling error

Sampling error occurs because estimates are based on a sample rather than a census; the precision is usually estimated through the calculation of standard errors.

[Standard errors for PPI](#) are published annually.

The sample allocation is reviewed annually to maximise optimality with the available resources. This occurs on PPI as part of the sample design process, but this does not currently occur for the Export Price Index (EPI) and Import Price Index (IPI).

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 that 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. The PPI revision policy is now in line with that of the national accounts. Published information on the [revisions policy](#) and revisions triangles show how estimates are revised over time. See the subsection on how we review and maintain the data process for further information on the revisions policy for the PPIs.

Indices where product coverage is of less than 70% or contributor coverage 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, geographic level.)

Prices

To ensure effective comparability, it is essential that the PPI reflects the price movements of products of fixed quality. When the specification of an item changes, only the “pure” price change is recorded for PPI purposes, and this generally relies on advice from manufacturers.

Sales data

Sales data for the PPI are collected from a range of data suppliers including survey and admin data. 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 [PPIs methods changes](#).

International

All major European countries are required to produce a PPI and submit them to the Statistical Office of the European Communities (Eurostat). While the coverage of various sectors may not be equal in all countries, the use of the European CPA ensures that all products are measured in a way that allows comparability across Europe. At the four-digit level and above, this is based on the [UN International Standard Industrial Classification of All Economic Activities, Rev.4 \(ISIC Rev. 4\)](#). This means that the PPIs are broadly comparable internationally. For more information, see the [Eurostat concepts and definitions database](#).

Price indices published by the ONS

The ONS publishes the Services Producer Price Index (SPPI), which measures business price inflation but is focused solely on the services products. For 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. However, in practice these account for a negligible proportion of the PPI. Both the PPI and SPPI are now published on a CPA 2.1 basis and are annually chain-linked.

In addition, the ONS publishes several consumer-focused price indices. These are the Retail Prices Index (RPI), Consumer Prices Index (CPI) and Consumer Prices Index including owner occupiers' housing costs (CPIH). The major difference between the PPIs and consumer-focused price indices is a difference in perspective. Business prices measure prices from the point of view of the manufacturer. For example, output prices in the PPI measure the price a manufacturer would ask wholesalers for their finished product. The Consumer Price Indices (CPIs) would measure how much a consumer would pay for this product when buying it from a shop (as such it would include additional margins such as transport costs). The PPIs can therefore act as early indications of inflation on the consumer price statistics, as an increase in the price wholesalers pay can translate to an increased price for consumers. For further detail on how the CPIs are calculated, see 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 format. 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.

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

- [Terms and conditions \(for data on the website\)](#)
- [Accessibility](#)

Timeliness and punctuality

(Timeliness refers to the lapse of time between publication and the period to which the data refer. Punctuality refers to the gap between planned and actual publication dates.)

The PPIs are published monthly with approximately two to three weeks between publication and the reference month to which the PPI data refer.

For more details on related releases, [our release calendar](#) 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 [Code of Practice for Statistics](#).

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 structure of the PPIs are defined by the European CPA. Earlier versions of the PPIs used the CPA 2008 (CPA 08). In line with Eurostat requirements, this has been updated to CPA 2.1. The structure of the classifications is the same down to the four-digit class level. This means there will be limited change to published series. An increased level of detail has been included at the six-digit level with the number of sub-categories increasing from 3,142 to 3,218.

The PPIs also distinguish between net and gross aggregations. The gross aggregation gives the price of manufactured goods to any sector (including other manufacturers). In contrast, the net aggregation is a measurement of the price of manufactured goods only to sectors outside of the manufacturing sector. Further detail on net and gross PPI and how these are calculated is available in [PPIs methods changes](#). The headline figure for the PPI will now be published on a gross sector basis. Previous headline PPIs were published on a net sector basis. This affects the November 2020 bulletin onwards.

Taxes are usually excluded from price measurement in the PPIs in line with international guidelines. However, several products are measured on two bases: one including tax and one excluding tax. The PPI headline figure has previously been a series inclusive of tax. From the October 2020 bulletin, the headline series will change to exclude tax to remove the impact of government policy on measures. This is to match international best practice. For further details on the removal of tax from the headline PPI, see [PPIs methods changes](#).

Input prices are the prices that manufacturers pay for materials consumed in the production process. They include materials and fuels that are both imported or sourced within the domestic market. They are also not limited to materials used in the final product but include what is required by businesses in their normal day-to-day running, such as fuels.

Output prices are also known as factory gate prices. This is because they can be thought of as the prices paid for the manufactured good at the factory gate before it is transported further. These prices include the margin that businesses make on goods, in addition to costs such as labour, raw materials and energy, as well as interest on loans, site or building maintenance or rent. The headline PPI uses output prices.

Eurostat requires PPI data from EU member states for use in economic, competition and enterprise policy. The UK is legally obliged to provide output prices for the domestic and non-domestic markets on a monthly basis under the short-term statistics regulation.

Geography

The domestic PPI covers manufacturers that purchase and sell goods within the UK. Our EPIs cover products manufactured in the UK that are to be sold on the export market. Our IPIs are made up of traders supplied from HM Revenue and Customs (HMRC) who are either manufacturers or operate as importers who sell onto manufacturers. We collect the prices they charge to UK manufacturing firms.

Output quality

(Quality trade-offs are the extent to which different dimensions of quality are balanced against each other.)

The [Producer price inflation statistical bulletin](#) is one of the timeliest economic releases, with outputs relating to a particular reference month published on a Wednesday. While this timetable does not have a significant impact on quality in terms of response information, there is a limit to the amount of contextual information that can be included in the release.

Why you can trust our data

The ONS is the UK's largest independent producer of statistics and its National Statistical Institute. The [data policies and information charter](#) detail how data are collected, secured and used in the publication of statistics. We treat the data that we hold with respect, keeping them secure and confidential, and we use statistical methods that are professional, ethical and transparent.

6 . Methods used to produce the PPI data

How we collect the data, main data sources and accuracy

There are two main types of data used in the calculation of the Producer Price Indices (PPIs). 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

We carry out the majority of price collection via a statutory monthly survey; however, some indices are compiled using prices from our survey and administrative data provided by third parties. These indices are:

- Agriculture – [Department for Environment, Food and Rural Affairs \(Defra\)](#)
- Energy (including crude oil) – [Department for Business, Energy and Industrial Strategy \(BEIS\)](#)
- Fish – [Marine Management Organisation \(MMO\)](#)
- Tea – [International Tea Committee](#)
- Coffee – [International Coffee Organization](#)
- Metals – Metal Bulletin
- Industrial minerals – Industrial minerals
- Commodities – [Financial Times](#)
- Exchange rates – [Financial Times](#)
- Wheat and grains, oilseeds and oil, fats and nuts – [Public Ledger](#)
- Milling and feed wheat – [AHDB Bulletin](#)
- Timber – [Forestry Commission](#)

Figures for the latest two months are provisional, and the latest 12 months are subject to revisions in light of (a) late and revised respondent data and (b) for the seasonally adjusted series, revisions to seasonal adjustment factors are re-estimated every month. A routine seasonal adjustment review is normally conducted in the autumn each year.

All index numbers exclude Value Added Tax (VAT). Excise duty (on cigarettes, manufactured tobacco, alcoholic liquor and petroleum products) is included, except where labelled otherwise.

Indices relate to average prices for a month. The full effect of a price change occurring part way through any month will only be reflected in the following month's index.

Sales data collection

The same sources are utilised to compile weights required for PPIs for both the previous rebasing method and the new annual chain-linked method. Sales data are gathered from several different organisations and surveys to ensure full coverage and representativeness of all product groups. These are all price updated before being used as weights in the PPIs.

UK manufactures' sales by product (ProdCom)

As with rebasing, most sales values and volumes for UK manufacturing are collected by our [UK manufacturers' sales by product \(ProdCom\)](#) survey.

Department for Business, Energy and Industrial Strategy (BEIS)

The ProdCom survey for annual UK manufacturing sales values does not cover crude oil, petroleum products, coal, gas and electricity industries. These industries annual sales values are instead sourced from the BEIS.

International Steel Statistics Bureau (ISSB)

The ProdCom survey only offers partial annual sales values coverage of the UK steel industry in the PPI gross sector output (GSO); the remainder is covered by surveys conducted by the International Steel Statistics Bureau (ISSB).

Annual Business Survey (ABS)

The Annual Business Survey (ABS) is a sample survey that collects annual sales data for UK businesses across the whole economy, including businesses within the manufacturing sector, and was also used during the last rebasing exercise. ABS data are used for calculating annual sales values that include duty, annual sales values for the water and forestry support service indices, and annual sales values for products that are not covered by other sources.

Department for Environment, Food and Rural Affairs (Defra) and Marine Management Organisation (MMO)

Defra and the MMO provide annual sales values for the home-produced food indices in the PPI.

HM Revenue and Customs (HMRC)

HM Revenue and Customs (HMRC) supply the Office for National Statistics (ONS) with annual export and import sales value data for use as weights in the Import Price Index (IPI) and Export Price Index (EPI). The coverage is split between trade to or from an EU and non-EU country, which correlates with the index structure in the IPI and EPI.

How we process the data

The methodology used to produce the PPIs is detailed in the series of papers on [Chain-linking in business prices](#). 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 manufacturing sector. We collect price data for many manufacturing 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 PPI). The way we do this is by making higher-level indices weighted averages of the 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 us 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 November 2020 bulletin, the PPIs have 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 either a two- or three-year lag the index being calculated. These are then updated to reflect prices in the reference period, which for the PPI is the December before the index being calculated (that is, the index for March 2020 will use December 2019 as the reference period).

How we analyse and interpret the data

To ensure that the PPI 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 monthly statistical bulletin and accompanying datasets.

At each calc run, the system calculates index values for the current month and re-calculates the index values for the previous 11 months. 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 and 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.

Further index and item value prints are generated for the EPI, IPI and PPI for checking by the publication team. The production analyst will highlight any index and item values with a percentage points difference of greater than 50% and a percentage difference greater than 15% respectively. The analyst will check that movements are genuine and look for anecdotal evidence from survey respondents to qualify large changes and to help create a story for the statistical bulletin.

A third set of revision prints are produced for analysis following pre- and main-calc. The purpose of this analysis is to establish the items causing any revisions and to check that they are correct and not errors of imputation or miss-keyed data. As with the previous checks, the production analyst will check there is genuine anecdotal evidence provided by survey respondents to explain any price movements. They will also check the date of returned prices as revisions occur as a result of late and revised respondent data. The latest 12 months of PPI figures are subject to revision.

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

We have two validation tests used to check the monthly movement of prices.

Dubious prices

Monthly price movements of plus or minus 7.5% are flagged as being dubious and checked with respondents for confirmation of the increase or decrease. Information relating to movement is inserted into the computer system as a record. Certain product groups are subject to tighter controls and are classed as dubious if the movements is plus or minus 3%, as is the case with alcohol.

Incredible prices

Monthly price movements of plus or minus 20% are flagged as incredible price movements and are checked with respondents for confirmation through a valid explanation for the price change. Information relating to movements is recorded on the computer system, and all incredible prices must be confirmed or cleared before the indices are calculated. Some volatile product groups, such as foods, have different parameters set.

Changes to item specifications and quality

If an item or product changes in specification and the price changes as a result, only the actual price change is reflected for the PPI. Quality improvements to products or changes to the specification of a product as well as alterations to the terms of sale or units of sale can all influence changes in the price of a product as well as a genuine increase in prices owing to production costs.

So we can cover the different reasons for price changes, three different types of specification changes are utilized on items within PPI:

- a new model or item has replaced an old model or item – W spec
- a new model has replaced an old model and there is an increase in production costs – X spec
- where an item has a price change only because of a cosmetic change – Z spec

How we disseminate the data

Producer prices are first released into the public domain to coincide with other price indices, the Consumer Prices Index (CPI), Retail Prices Index (RPI) and House Price Index (HPI) on a monthly basis. Service Producer Prices Index (SPPI), which also forms part of prices, is published on a quarterly basis.

Aggregate-level PPIs are published firstly in a monthly [statistical bulletin for Producer price inflation](#). As part of the PPI release, detailed data at lower levels of industry and product level are also published monthly in [Producer price inflation \(MM22\)](#).

More detailed information regarding published PPI data can be found in Chapter 6 of the PPI methods and guidance. Future publication dates can be found in [our release calendar](#).

How we review and maintain the data processes

The PPI policy is to show significant revisions but to suppress minor changes to avoid unnecessary inconvenience to users. Indices for the most recent two months are shown as provisional and can be changed as later data become available. The latest 12 months are subject to revisions in light of late and revised contributor data.

7 . Other information

To read about the five-yearly rebasing method in greater detail, see the [Producer Price Index \(PPI\) methods and guidance from 2014 \(PDF, 1.14MB\)](#).

An assessment of the impact of changing from the five-yearly rebasing method to the annual chain-linked method is available in the [PPI impact assessment](#).

A guidance document on how to rescale long term contracts to reflect the update of weights is available in the [PPI rebasing 2010 – questions and answers document \(DOC, 34KB\)](#) and the [Guidance on using Indices in Indexation Clauses \(PDF, 197KB\)](#). 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 the PPIs are available in [PPIs methods changes](#).