

# Deflator improvements to the UK National Accounts: Blue Book 2023

Methodology improvements to national accounts deflators for Blue Book 2023.

Contact:  
Rob Bucknall  
deflator.development@ons.gov.  
uk  
+44 1633 455646

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# 1 . Why deflators are important

Deflators play an important role in precisely assessing changes in the economy over time. The [UK National Accounts, Blue Book 2023 compendium](#) introduces several improvements to deflators, aiming to refine the measurement of the real economy by identifying the impact of inflation.

Deflators eliminate inflationary effects, allowing the measurement of values in "real", rather than "nominal", terms. By removing the effects of inflation, the "real" estimates offer insights into the actual changes in the volume of economic activity. A more in-depth understanding of deflators and their applications in economic assessments is available in our [Deflators and how we use them in economic estimates methodology](#).

## 2 . Background to the improvements

In 2016, the [Independent Review of UK Economic Statistics](#) identified areas of improvements in the Office for National Statistics's (ONS's) economic statistics and included an important recommendation to improve our deflators in a number of ways. In 2022, we published our most recent [National Accounts Deflator Strategy](#), which details our aims and work to address these areas of improvements. In Blue Book 2021, we made [improvements to our measurement of telecommunications services and clothing](#). We have since continued research into improving our deflators, with a particular focus on products and services that are experiencing rapid quality change, such as computer hardware, computer software and cloud computing services.

## 3 . Blue Book 2023: improvements to deflators

In the context of Blue Book 2023, various improvements have been implemented, encompassing both systems and methodologies. These modifications collectively contribute to the establishment of a more robust approach to measuring price fluctuations and, consequently, the real values or volumes reflected in the UK National Accounts. The team operates with four core objectives, previously detailed in our [National Accounts Deflator Strategy](#) and are outlined as follows:

- Aim 1: capture quality change more effectively
- Aim 2: make better use of existing data sources and explore the use of alternative data sources to improve the quality and consistency of deflators across economic statistics
- Aim 3: ensure we have efficient and effective processes that improve the production, quality assurance and narrative around deflators
- Aim 4: keep pace with changes in international guidance

For Blue Book 2023 we have delivered the following work.

# Addressing Aim 1: capturing quality change

## Computer hardware deflators

It is essential that quality change in products and services is captured in deflators as these should be reflected as changes in real activity. Computer hardware products have experienced significant quality change since 1997, which was not sufficiently accounted for in the previous deflators. In order to better capture the quality change experienced in computer hardware products (Classification of Product by Activity, CPA C26.2), we have made two adjustments to the deflators.

For the Producer Price Index (PPI) and Export Price Indices (EPIs), used to deflate output and exports, respectively, we have adjusted using a new quality adjustment factor. This is derived from the Consumer Prices Index's (CPI) existing measure of quality change in these products, obtained using hedonic adjustment, and the weight of desktop PCs and laptops within the domestic production and exports of computer hardware and peripheral products as a whole.

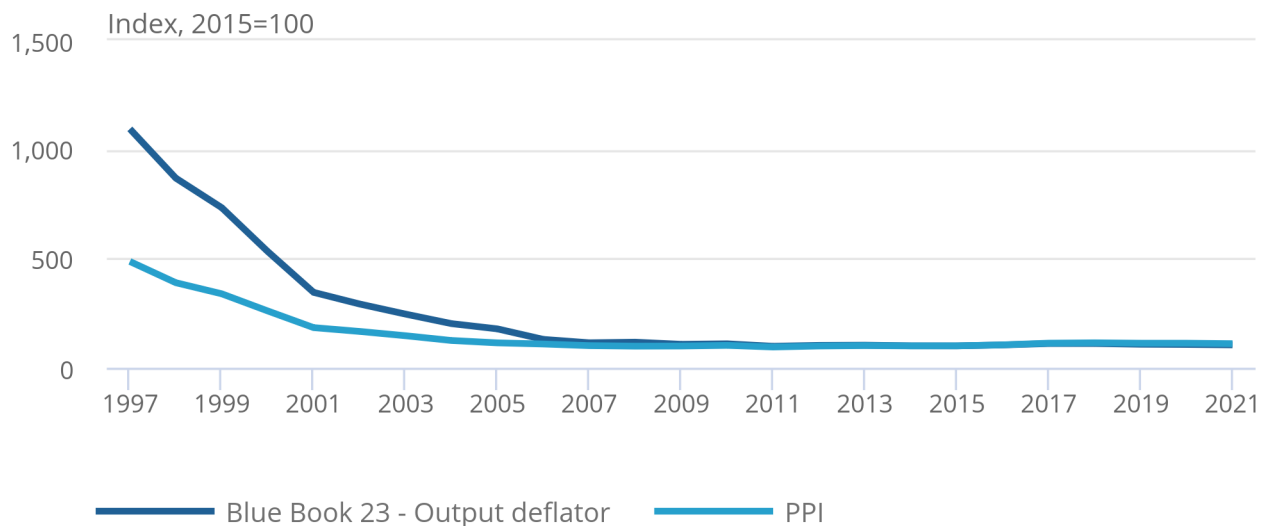
We have also developed a proxy index to deflate imports using the PPI series for computer hardware products of a sample of countries from which we source computer hardware products, weighted using HM Revenue and Customs (HMRC) import data and adjusted for exchange rates. This was necessary because the previous imports deflator, the Import Price Index (IPI), for computer hardware products has a limited sample size and only includes imports used in manufacture. Once the planned Business Prices development is complete, we intend to return to using the IPI with quality adjustment applied as necessary. For more information on the planned Business Prices development, see our article [Producer prices development plan: October 2023](#).

**Figure 1: Output deflators for computers and peripheral equipment**

UK, 1997 to 2021

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UK, 1997 to 2021



Source: Blue Book 2023 and Producer Price Indices from the Office for National Statistics

The revised output deflator is shown in Figure 1 alongside the existing PPI. The greater fall in the new deflator reflects the decrease in the real price of computer hardware products, particularly in the period 1997 to 2008, largely as a result of quality change. The trends of the two series have converged since 2011 because of the slowing rate of quality change in computer hardware products. Therefore, the quality adjustments had a smaller impact in the updated deflator. Similar decreases are now evident in our improved deflators for imports and exports of computer hardware products.

## **Addressing Aim 2: making better use of data sources**

### **Market output deflators**

We have updated the weighting methodology for our market output deflators (affecting CPAs 10 to 30). Previously, we used monthly data at an industry level, which were not the most appropriate for weighting product deflators and resulted in differing trends. We are now using more suitable data sources (specifically HMRC and ProdCom) at a more granular product level and annual chain-linking to create weights for the aggregation of Producer Price Indices (PPIs) and Export Price Indices (EPIs), resulting in a more accurate representation of output price trends.

### **Travel deflators**

The previous source for the imports travel deflator ended in 2016, prompting an opportunity to develop an improved measure for both imports and exports. For imports, a travel deflator has been constructed using a weighted average of CPIs from other countries. They are specifically related to travel spending (such as food, transport and accommodation services), and are adjusted for exchange rates. For exports, two new deflators have been developed, covering travel services (excluding education) and education travel services, using weighted UK CPIs. These improvements result in more representative deflators, with source data available regularly.

### **Service sector deflators**

We have replaced the use of a 50:50 weighting of the headline CPIY (CPI excluding indirect taxes) and sector-level Average Weekly Earnings (AWE) as proxies for the output prices of nine services with relevant Service Producer Price Indices (SPPIs).

The previous deflators were generic and based on an assumption that labour and materials were the primary sources of inflation in these services. The replacement SPPIs are specific to these services, and using SPPIs to deflate service output is in line with international best practice. The use of SPPIs will also make it easier to include any future quality adjustment in the deflators.

There have been a number of methods improvements made to SPPIs in recent years, including:

- the introduction of chain-linking
- a new index weight source (Annual Survey of Goods and Services)
- a change in classification used from CPA08 to CPA2.1
- a move from “business-to-business” to “business-to-all” coverage

For more information on the SPPI methods changes, see our article [Services Producer Price Index methods changes](#).

## Addressing Aim 3: using effective processes

### Deflator Gateway

Historically, deflator processing happened in separate areas across the UK National Accounts, without clear ownership or transparency. This made it difficult to track the uses of deflators and implement improvements.

The Deflator Gateway is a central compilation system for deflation, using inputs including price data and alternative data sources, and robust, consistent methods. This has ensured a coherent application of deflators across the national accounts, supported by analytical briefing on a regular basis, creating deflation measures that are fit for purpose for customers and the national accounts. It will also enable easier implementation of future methods or data changes to the deflators.

More detail on the impact of these changes is captured in the Blue Book publications for gross domestic product (GDP), [Impact of Blue Book 2023 changes on gross domestic product](#), and supply and use, [Impact of Blue Book 2023 changes on current price and volume estimates of gross domestic product](#). Both monthly GDP and supply and use have also released updated sources documents which include the deflators changes, [GDP\(o\) data sources catalogue](#) and [Supply and use tables data sources catalogue](#).

## 4 . Future developments

We also have plans for further deflator development in upcoming Blue Books. These are aligned to the aims outlined previously, which were introduced in our 2022 strategy.

### Blue Book 2024

#### Natural gas export deflator

Aim 2: better use of data sources

In order to bring our exports deflator in line with our import deflator for natural gas, and to accurately capture the extreme price changes over the last few years, we will be making updates to our exports price index for natural gas. We will be making use of admin data from HM Revenue and Customs (HMRC) to implement a unit value method to calculate the deflator, in line with the method used for the import deflator. This will initially cover the years from 2021.

### Blue Book 2025

#### HMRC Unit Value Indices

Aim 2: better use of data sources

We are intending to implement an alternative methodology to better measure trade prices for select products using unit value indices calculated from HMRC data. Using this methodology will address some concerns over the existing deflators as well as reducing the burden on the Business Prices team to produce these indices.

## 5 . Related links

[Impact of Blue Book 2023 changes on current price and volume estimates of gross domestic product](#)

Article | Released 3 July 2023

Methodological and data improvements that affect current price and chain volume measure of gross domestic product (GDP), 1997 to 2020.

[UK National Accounts. The Blue Book: 2023](#)

Compendium | Released 31 October 2023

National accounts statistics including national and sector accounts, industrial analyses and environmental accounts.

[National accounts, deflator strategy: November 2022](#)

Article | Released 29 November 2022

Strategy for improving the suite of deflators used across the UK National Accounts, and a roadmap of work to improve our measurement of key economic indicators.

[Impact of Blue Book 2023 changes on gross domestic product](#)

Article | Released 1 September 2023

Impact of methodological and data improvements on current price and chain volume measure of quarterly gross domestic product (GDP), 1997 to 2021.

## 6 . Cite this methodology

Office for National Statistics (ONS), released 8 January 2024, ONS website, methodology, [Deflator improvements to the UK National Accounts: Blue Book 2023](#)