

Article

Using Auto Trader car listings data to transform consumer price statistics, UK: July 2023

Car listings data will improve measurement of consumer prices from 2024. This article updates our methods and research indices using these data.

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1 . Overview

- Alternative data sources, and methods to use these data sources, are being introduced into consumer price statistics, as detailed in our [Transformation of consumer price statistics article series](#); for example, new data for rail fares were first introduced in February 2023 indices (published in March 2023).
- This article updates details of our previous proposed methodology for producing consumer price indices using new second-hand cars data and also updates our research indices, compared with our previous [Using Auto Trader car listings data to transform consumer price statistics. UK article](#), published June 2022.
- In our previous article, we suggested these data would be introduced in March 2023, however, to make further necessary improvements to our methods and systems to ensure their reliability, we postponed this introduction by a year, to March 2024, as discussed in our [Transformation of consumer price statistics: July 2023 article](#).
- The research indices presented in this article are broadly in line with the trends seen in our published data, highlighting the quality of our historic measurement of overall second-hand car inflation; however, with these new data, we can produce more granular statistics, which offer additional insights into the components driving second-hand car inflation in the UK.
- This work also ensures that any future changes in pricing policies in the second-hand car market are more appropriately captured, and that the methods and systems that have been developed can be used to onboard further data sources in future (such as, electronic point of sale scanner data), as part of our programme of continuous improvement.
- More information on methods used in our current publication can be found in our [Consumer Prices Indices Technical Manual, 2019](#).

2 . Methods improvements

Since our [Using Auto Trader car listings data to transform consumer price statistics. UK article](#) from June 2022, we have made the following improvements to our research indices (some of these methods improvements were also addressed in Section 5 of our [Impact analysis on transformation of UK consumer price statistics: rail fares and second-hand cars. November 2022 article](#)).

Removed write-off categories

Cars that are listed as belonging to write-off categories have been removed from the data. This change is important in making sure only comparable cars are priced over time. However, given the small proportion of the data that belong to these write-off categories (around 1.5%), the impact of this improvement has been negligible.

Reordered stratification variables

We have reordered the hierarchy so that indices are primarily produced and analysed by fuel type instead of age; age and make are now used as stratification variables. This was discussed with our users and [Stakeholder Advisory Panel on Consumer Prices \(APCP-S\) in July 2022](#) and decided it would be the most useful stratification for analytical and policy purposes.

Improved calculation of weights

We have improved our method of calculating weights for second-hand car indices, from using quantities of cars present in the data, to using expenditure approximations based on the quantities of car types assumed sold and their average prices. While this change had a small impact on the resulting indices, using expenditure to aggregate indices aligns with international best practice.

Improved data cleaning procedures

We have made improvements to our data cleaning procedures, using month-on-month price relative-based user-defined fences to detect outliers as detailed in our [Outlier detection for rail fares and second-hand cars dynamic price data methodology](#).

Improved index number method approach

We have made improvements to the implementation of our index number method approach, as discussed with our [Technical Advisory Panel for Consumer Prices \(APCP-T\) in October 2022 \(PDF, 357KB\)](#) and published in our [Introducing multilateral index methods into consumer price statistics methodology](#).

Explored a Time Dummy Hedonic (TDH) approach

We explored the use of the TDH index method, a popular alternative to our “homogeneous product” GEKS-Törnqvist approach, to understand the potential for bias within our indices, as discussed with our [Technical Advisory panel on Consumer Prices \(APCP-T\) in April 2023 \(PDF, 454KB\)](#). Encouragingly, we found that the two approaches gave very similar indices. However, since the TDH is much more difficult to develop, interpret and maintain, we retained a preference for using the “homogeneous product” GEKS-Törnqvist approach.

3 . Updated research indices

Figure 1 shows the annual growth rates for our currently published second-hand cars index, compared with the annual growth rates for diesel and petrol second-hand cars produced using new data and methods, between January 2018 and February 2023. Broadly, the growth rates have a similar trend throughout this period, though the new indices show less volatility.

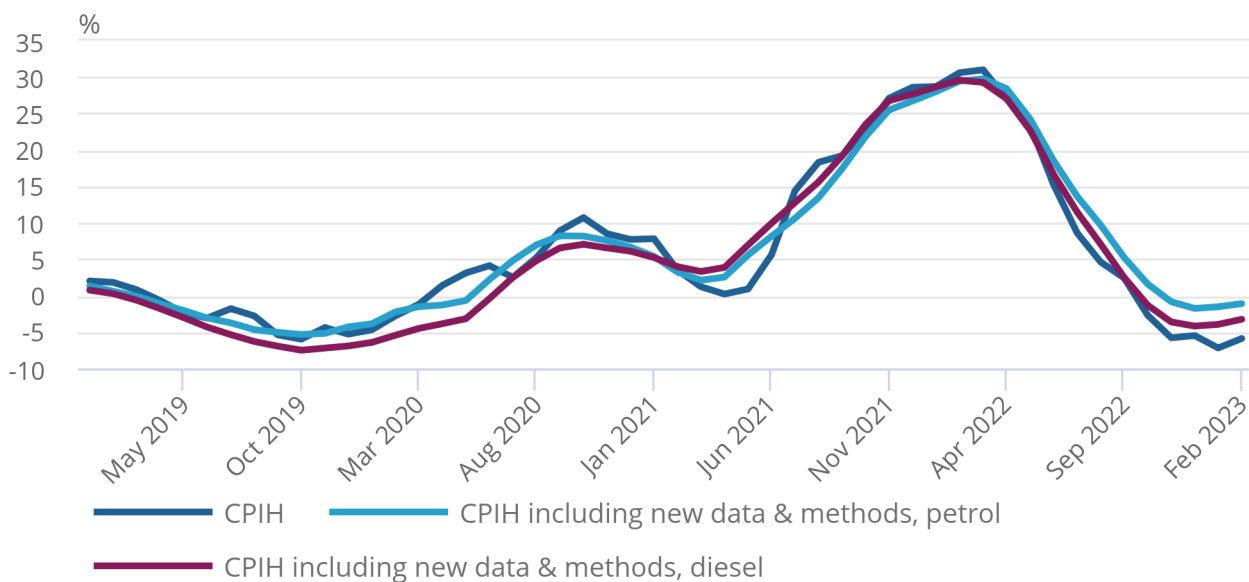
There are many potential reasons for differences between the published and revised series. In particular, the revised series have substantially increased coverage (both temporal and market coverage), meaning that the price indices are less sensitive to sudden price movements of individual makes or models of car.

Figure 1: Comparison of annual growth rates using new methods and data with the published CPIH second-hand cars series, Jan 2018 = 100

UK, January 2019 to February 2023

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Source: Using Auto Trader car listings data to transform consumer price statistics, UK from the Office for National Statistics

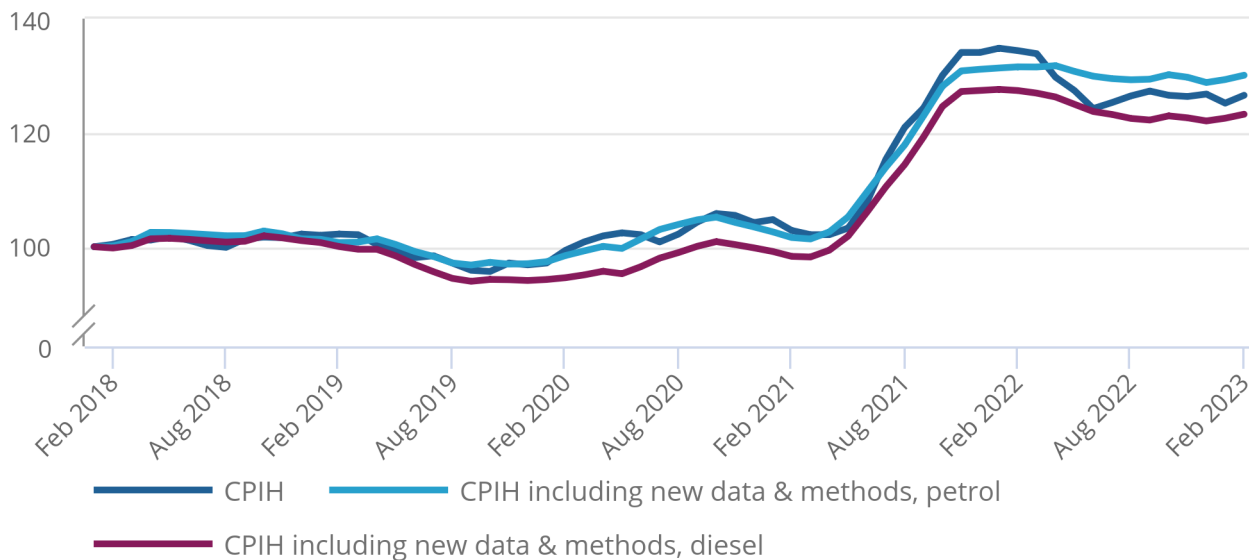
Figure 2 shows the cumulative effect of these differences on the indices between January 2018 and February 2023. As we saw with the growth rates in Figure 1, broadly, the indices show similar trends throughout this time period.

Figure 2: Comparison of second-hand cars indices using new methods and data to the CPIH published series, Jan 2018 = 100

UK, January 2018 to February 2023

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UK, January 2018 to February 2023



Source: Using Auto Trader car listings data to transform consumer price statistics, UK from the Office for National Statistics

Figures 1 and 2 show that diesel cars have experienced slower price growth than petrol cars over this period. This was a trend that we could not previously observe in our published indices.

These new petrol and diesel second-hand car indices are also further stratified by age (between 1 and 10 years) and make (approximately 25 makes per fuel type). We will therefore be able to provide users with more detailed information for example, on the age of second-hand cars that are contributing to the change in inflation. Users can gain this information through the monthly [Consumer price inflation detailed briefing note dataset](#). Although these lower-level indices will not be published as part of the regular inflation tables, they can be produced for the purposes of ad-hoc analyses and to help explain the underlying contributions to second-hand car inflation in the UK.

4 . Future developments

In our future work, ahead of entering production with this data source, we are in the process of:

- acquiring a new variable from Auto Trader, to improve standardisation in a vehicle's mark, reducing unnecessary product churn
- finalising and testing our systems development, to allow sustainable index calculations within a production environment
- producing a final impact analysis in November 2023, to ensure readiness for production.

We then intend to introduce these data within official measures when publishing the February 2024 indices (within the March 2024 publication).

5 . Related links

[Research and developments in the transformation of UK consumer price statistics: July 2023](#)

Article | Released 26 July 2023

Research to modernise the measurement of consumer price inflation in the UK: sixth in a series of biannual articles to update users.

[Date trimming for consumer prices alternative data sources](#)

Article | Released 26 July 2023

Exploration of the theory behind date trimming and its implementation in the calculation of consumer price statistics in the UK, using new data sources for grocery products.

[Transformation of consumer price statistics: July 2023](#)

Article | Released 6 July 2023

We are undertaking a programme of transformation across our consumer price statistics, including identifying new data sources, improving methods, and developing systems to improve both the Consumer Prices Index including owner occupiers' housing costs (CPIH) and the Consumer Prices Index (CPI).

[Consumer price inflation, UK: June 2023](#)

Bulletin | Released 19 July 2023

Price indices, percentage changes, and weights for the different measures of consumer price inflation.

[Consumer Prices Indices Technical Manual, 2019](#)

Methodology | Last revised 22 March 2023

This technical manual is a reference tool for anyone wanting to understand how measures of consumer price inflation and associated indices are compiled.

6 . Cite this article

Office for National Statistics (ONS), released 26 July 2023, ONS website, article, [Using Auto Trader car listings data to transform consumer price statistics, UK: July 2023](#)