Consumer Prices Inflation: Teach-in

Office for National Statistics

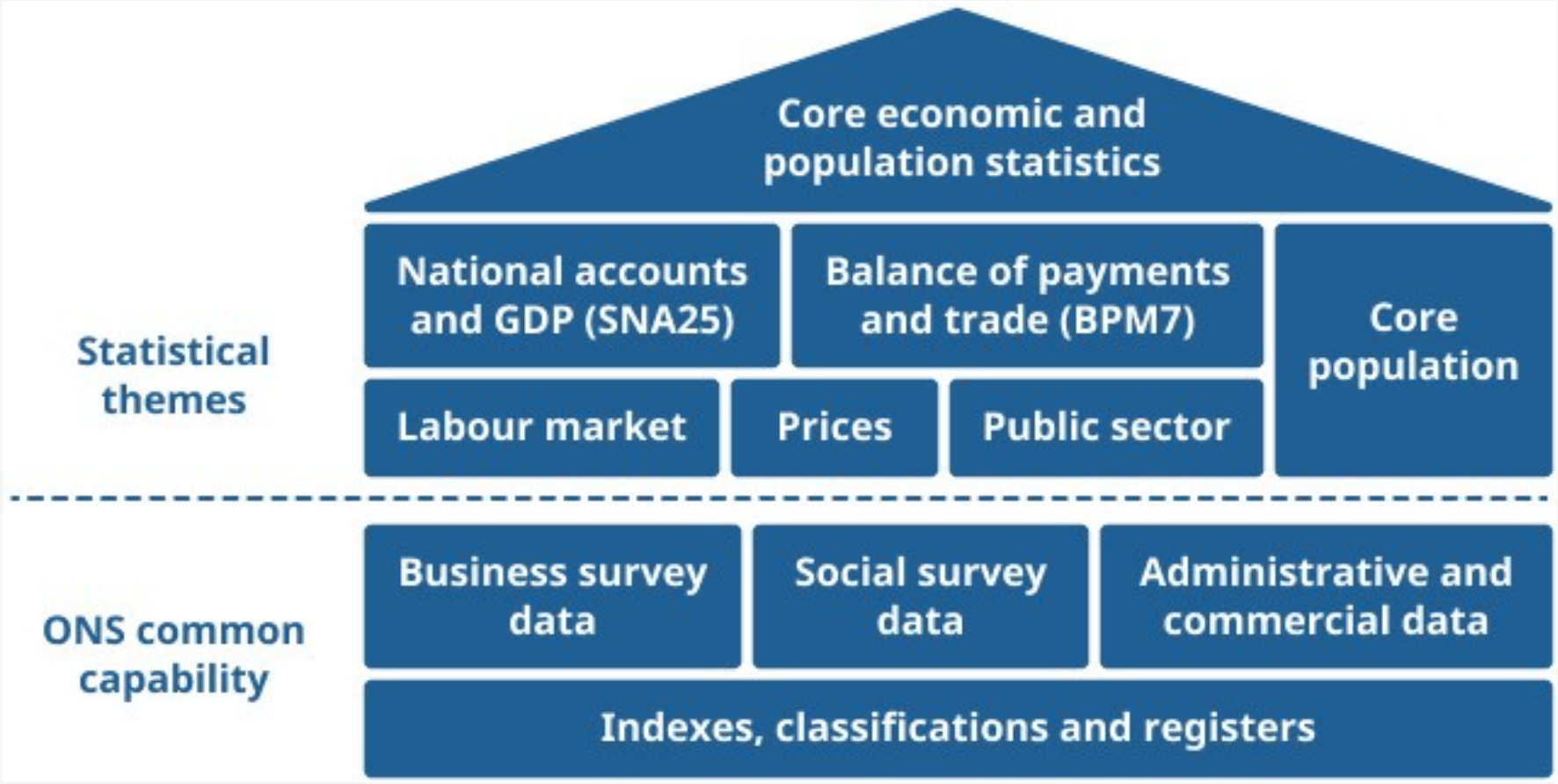
7 November 2025

Office for National Statistics

ONS Consumer Prices inflation landscape, transformation & big data integration

The ONS Economic Statistics Plan

ONS building block model



Economic statistics and survey recovery plans

- Both plans were published by ONS on 26 June 2025

The Economic Statistics Plan

- Six main strands: prices, GDP, labour market, trade and balance of payments, public sector finances, and core population statistics
- The Plan includes creation of continuous improvement teams and achieving sustainable resourcing for statistical production
- In addition, implementation of international macroeconomic statistics standards (IMSS) runs across several strands in the plan
- Initial funds have been released to recruit for 100+ roles

Economic statistics and survey recovery plans

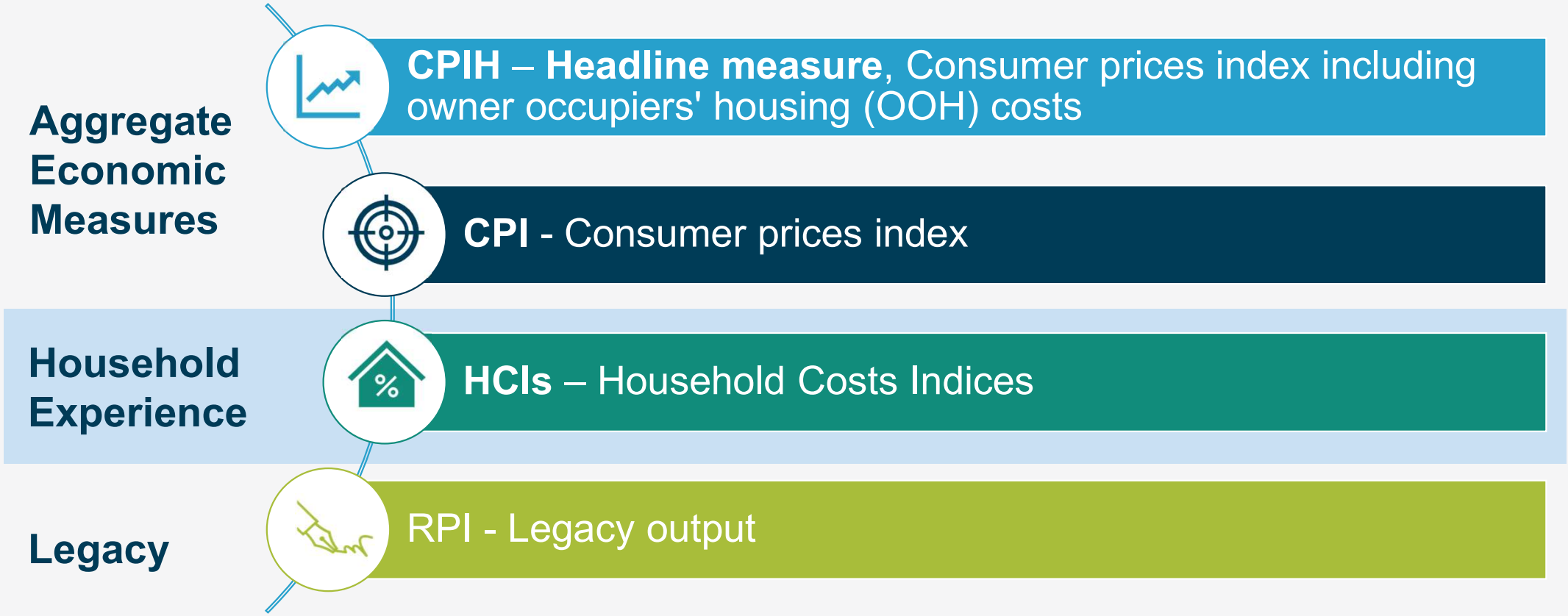
The Survey Improvement and Enhancement Plan:

- Builds on extensive past work – developed since April 2024 (pre-OSR and Devereux reviews)
- Reflects the urgent need to improve data quality and sustain surveys
- Replaces the IDBR with a new, more comprehensive Statistical Business Register
- 52 activities/key milestones, ~£27m investment in FY25/26 (+ TLFS)
- We are committed to quarterly public reporting, starting from December
- We will update and refresh both Plans annually (next in Q2 2026)

Going forward

- We recognise that in recent years some of our key economic statistics have not met users' expectations on quality
- To improve quality, we are now prioritising core economic outputs and their underpinning surveys
- Methodological improvements may identify further issues – we'll continue to be open and transparent about them
- Delivering these plans requires some urgent and tough decisions to reduce non-core statistics and analysis – we'll keep users informed as we work through these.

Consumer prices statistics landscape



Transforming the UK's consumer price statistics

Transforming our consumer price statistics

- Obtaining alternative data sources (ADS), including grocery scanner data
- Researching and integrating new methodologies to process the data
- Developing statistical systems
- Embedding new processes
- Allows us to improve the accuracy, efficacy and representativity of consumer price inflation statistics.
- Primarily, new data will help us to inform the narrative around what is driving inflation for our users.

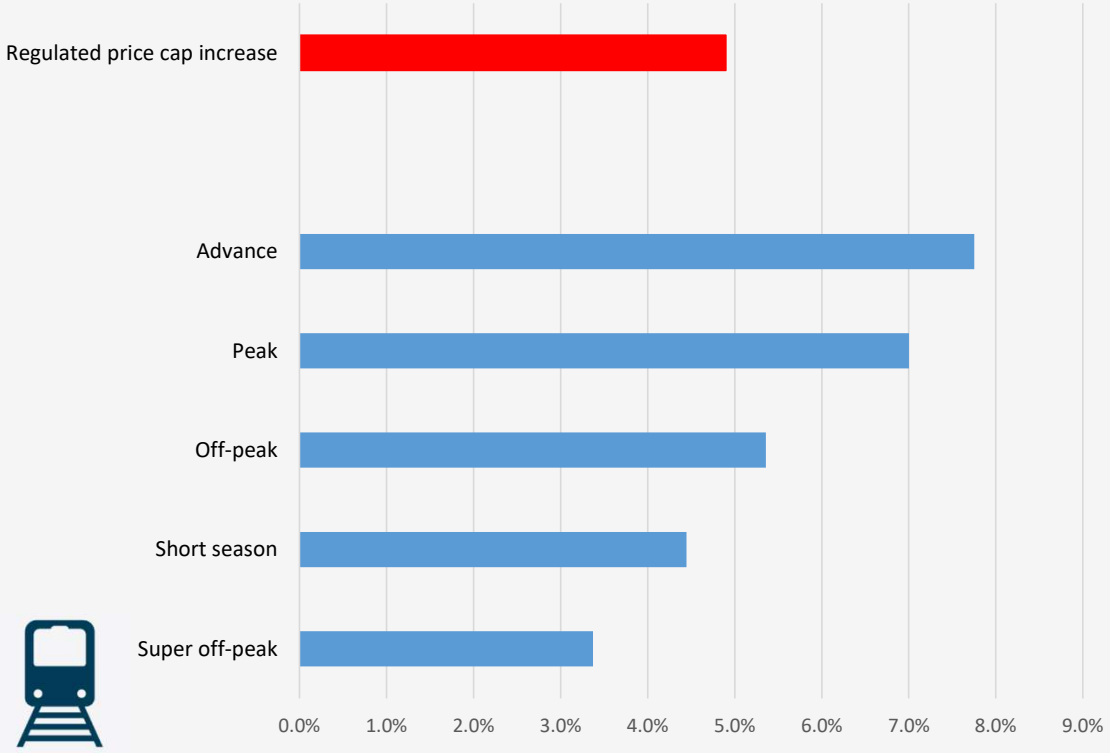
Data sources	Year of implementation	Proportion of the basket	Traditional data points	Admin data points
Rail Fares	2023	~1%	1	40m
Second-hand cars	2024	~2%	1	400,000
Rents	2024	~24%	-	500k
Grocery scanner data (50% of the market)	2026	~7%	25k	300 million

Principles behind transformation

Radical • World leading research • Private sector data partnerships • Successful media engagement	**Ambitious** • The first transformation of this scale in economic statistics • Latest systems development in the cloud • Data direct from retailers
Inclusive • Engaging users • Working across government • Broadening and deepening our data	**Sustainable** • Prioritising quality of statistics • Ensuring sustainability of systems • Planning contingencies on data supply • Reducing reliance on legacy systems

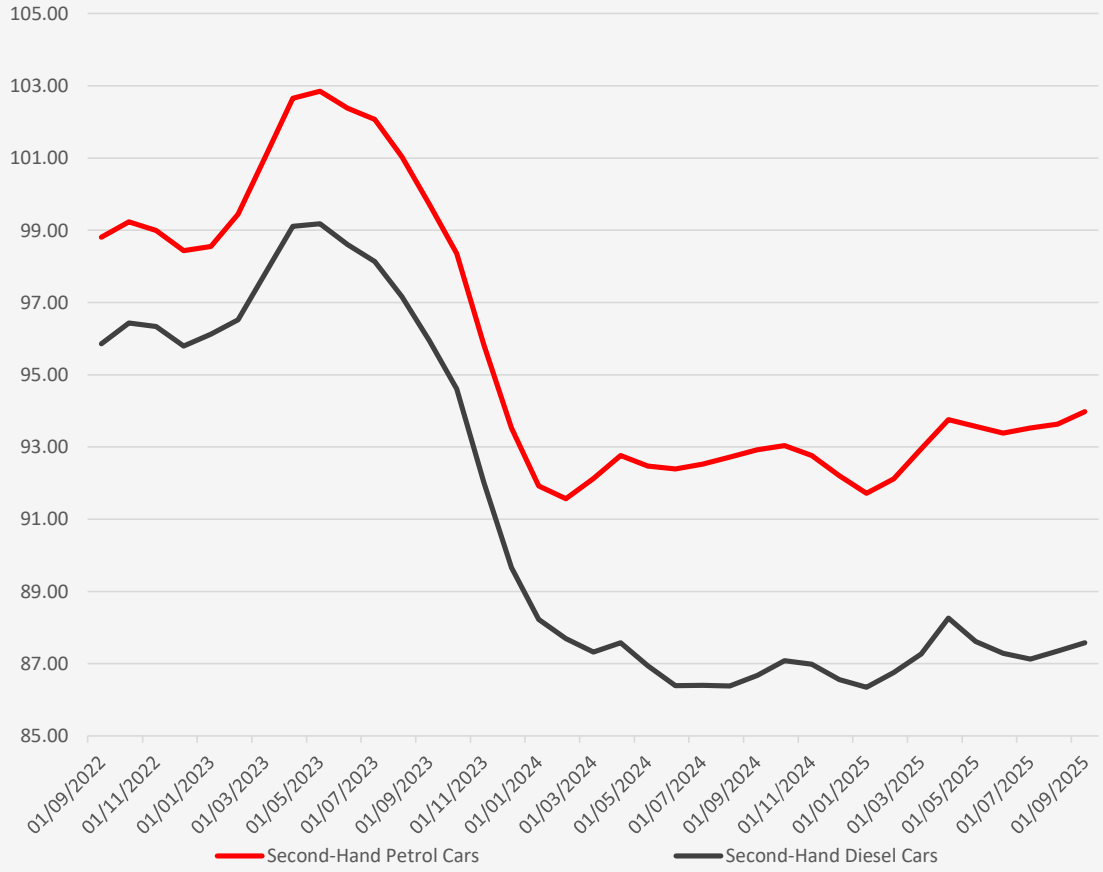
Rail fare price increase using LENNON data

March 2024-March 2025 price increase by ticket type, GB



- Transaction-level rail fares data are now incorporated in headline measures
- Millions of transactions per month
- Indices are more responsive and informative
- Under the old method, ONS would have potentially underreported price inflation.
- Only 40% of fares are regulated

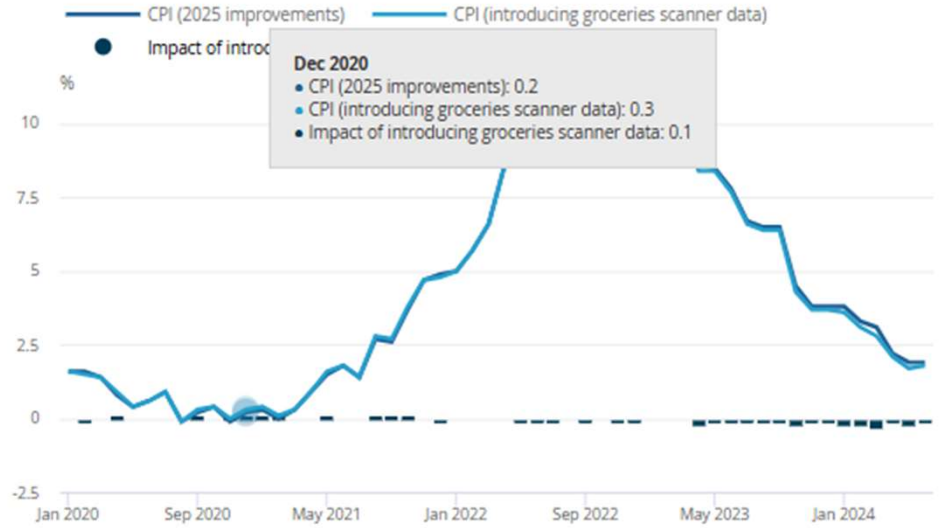
Second hand car market using Autotrader data



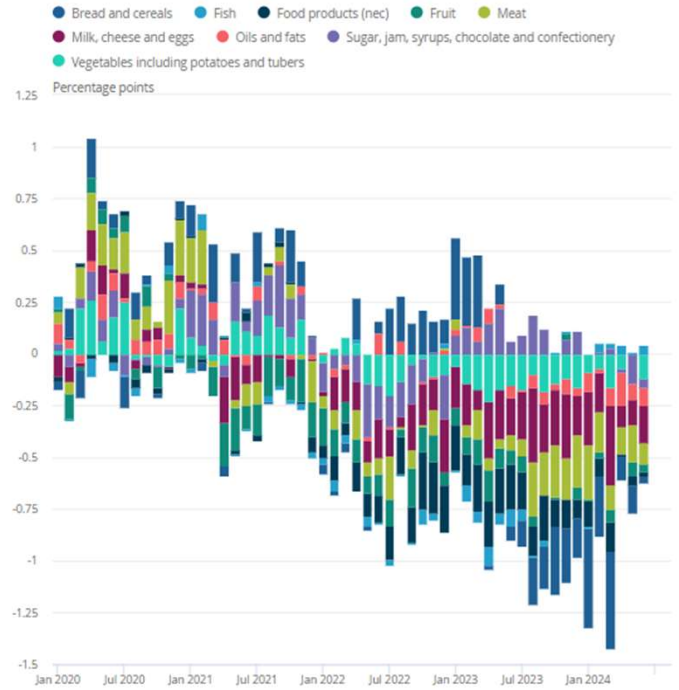
- Autotrader data captures around 70% of the used car market
- Able to view metrics on age, mileage and make to name a few
- Provided accurate data on the effect the COVID-19 pandemic had on supply of used cars
- In the latter half of 2023, used car prices dropped dramatically after peaking earlier in the year, due to disruption in the new car market from chip shortages and covid, driving up demand in the used car market

Impact of scanner data on consumer prices

Indicative impact of implementing groceries scanner data on Consumer Prices Index (CPI) 12-month rate (including 2025 methods improvements), UK, January 2020 to June 2024



Contributions to the difference between the annual rate for the Consumer Prices Index (CPI) food index, including 2025 methods improvements, series including groceries scanner data minus series not including groceries scanner data, UK, January 2020 to June 2024



Scanner data in March 2025 – next steps

- We are working with the Bank of England and HM Treasury under the Statistics and Registration Service Act to assess whether grocery scanner data can be incorporated into the RPI.
- The impact analysis, final decision, and exchange of letters with the Bank are planned for publication in January, consistent with previous years (exact date to be confirmed).

What's next?

- ONS is in the process of an organisation-wide prioritisation exercise.
- Greater emphasis will likely be placed on business price statistics, with a focus on systems and methodological improvements to enhance quality.
- We will continue to improve our consumer price statistics data processing systems

- For consumer price statistics, we are exploring:

  - Broader coverage of grocery retailers to increase market share above 50%.
  - Inclusion of non-grocery items from grocery retailers
  - Potential use of alternative data sources for other areas of the basket.
  - Clothing – difficult for a number of reasons.

Microdata feedback survey

- We currently publish:
  - **Raw price quote data** and related metadata from the local price collection, and
  - **Item (consumption segment) indices** for the majority of the basket.
- We will not be able to publish the same level of information for groceries from March 2026; however, we will continue to publish non-groceries data in the same format.
- A user feedback survey was run in late 2024 which we are using to develop alternative metrics for the groceries basket
- We aim to publish some prototype tables in January 2026

CPI production and hard-to-measure CPI items: Methodology deep dive

CPIH/CPI – conceptual basis

- CPIH – our most comprehensive measure, so CPI including housing costs and council tax
- CPI – internationally comparable measure and the Bank inflation target
- Both:
  - Average measure of the change in price for goods and services consumed in the UK
  - Reference population – expenditure of all private households, foreign visitors and residents of communal establishments within the territory.
  - Domestic concept – UK household spend abroad excluded
  - ‘Index day’ CPI/CPIH intended to reflect prices near the middle of each month

The scale of production

- A traditional collection of **~190,000** price quotes via field, admin data and internal ONS collections, plus **~40 million** prices from alternative sources like **used cars** and **rail fares.**
- A major transformation proposed for 2026 with **~300 million** prices monthly **from grocery scanner data** to dramatically expand coverage and granularity.
- The publication of **2,750 data series (CDID's)** published monthly across **CPI, CPIH and RPI** including detailed growth rates, averages, contributions and defined aggregates which offer a rich and granular view of UK inflation.
- The consumer inflation virtual basket of goods and services with **~750 items** updated annually

Collection modes

Verian
Local collection

- regional price variations are captured
- monthly collection

ONS
Central shops

- national pricing is implicit
- mixed store and internet purchases
- monthly collection

ONS
Central collection

- mix of regional and national prices
- predominantly internet purchases
- monthly, quarterly, annual

ONS
Phone calls

- regional price variations
- prices can't be collected in other ways
- quarterly (on monthly rotation)

Collection modes

Verian
Local collection

- 135k prices for around 560 basket items across approx. 140 UK locations

ONS
Central shops

- 4k prices across 390 items from 48 retailers

ONS
Central collection

- Around 45k prices across 150 items
- Not including rents - which has a sample of 500k

ONS
Phone calls

- Around 6k prices

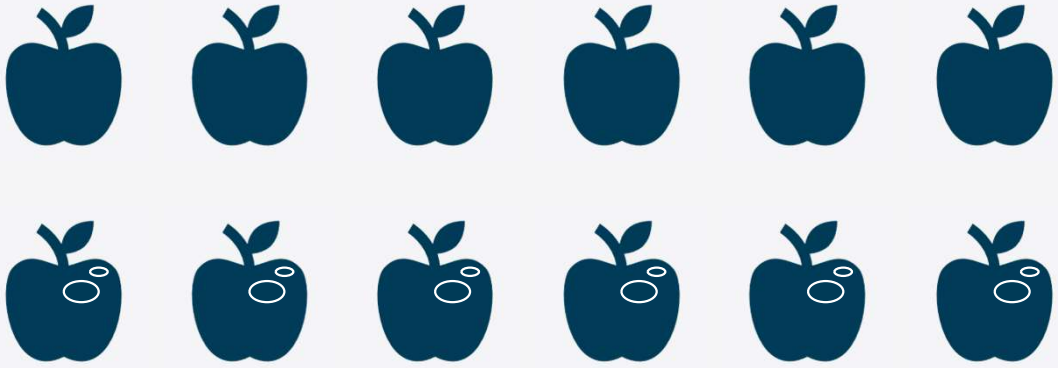
We apply a fixed basket approach

Measures the change in price of a *representative fixed basket* of over 700 goods and services

The basket is updated annually to keep it relevant.

The fixed basket – fixed in quality and quantity

Because we aim to track the price of a *fixed* basket, we need to hold other factors constant.



Quantities

Quality

CPI = HICP

- CPI (and CPIH) align with the wider HICP regulation
- Regulation required that weights are updated at all levels of COICOP every year –annual update regarded as best practice regardless
- Regulation defines weight as ‘expenditure share’
- Weights should be based on the most comprehensive spending data (HHFCE) and relate to a 12-month period
- Should be best indicator of ‘t-1’ as possible

Higher level CPI weights

- Basic premise of weights – to reflect the relative share of a component of the basket in the index reference period (Laspeyres based concept)
- Mainly updated using the most complete source of household spending available to us from HHFCE
- Some adjustments made to expenditure
- Lagged by 2 years – but in normal times deemed to be representative of t-1 calendar year

Higher level weights

- Higher level weights compiled at the ‘Coicop5’ level (sub-class)
- Expenditure ‘price updated’ at this level
  - Laspeyres type indices – or better known as 'Lowe Index'
  - Lowe index needs weight reference period to equal price reference period
  - To bring expenditure in line with price reference period we 'price update' - we adjust for any price change over the interval between the two reference points
  - Effectively revalue expenditure at price reference period prices

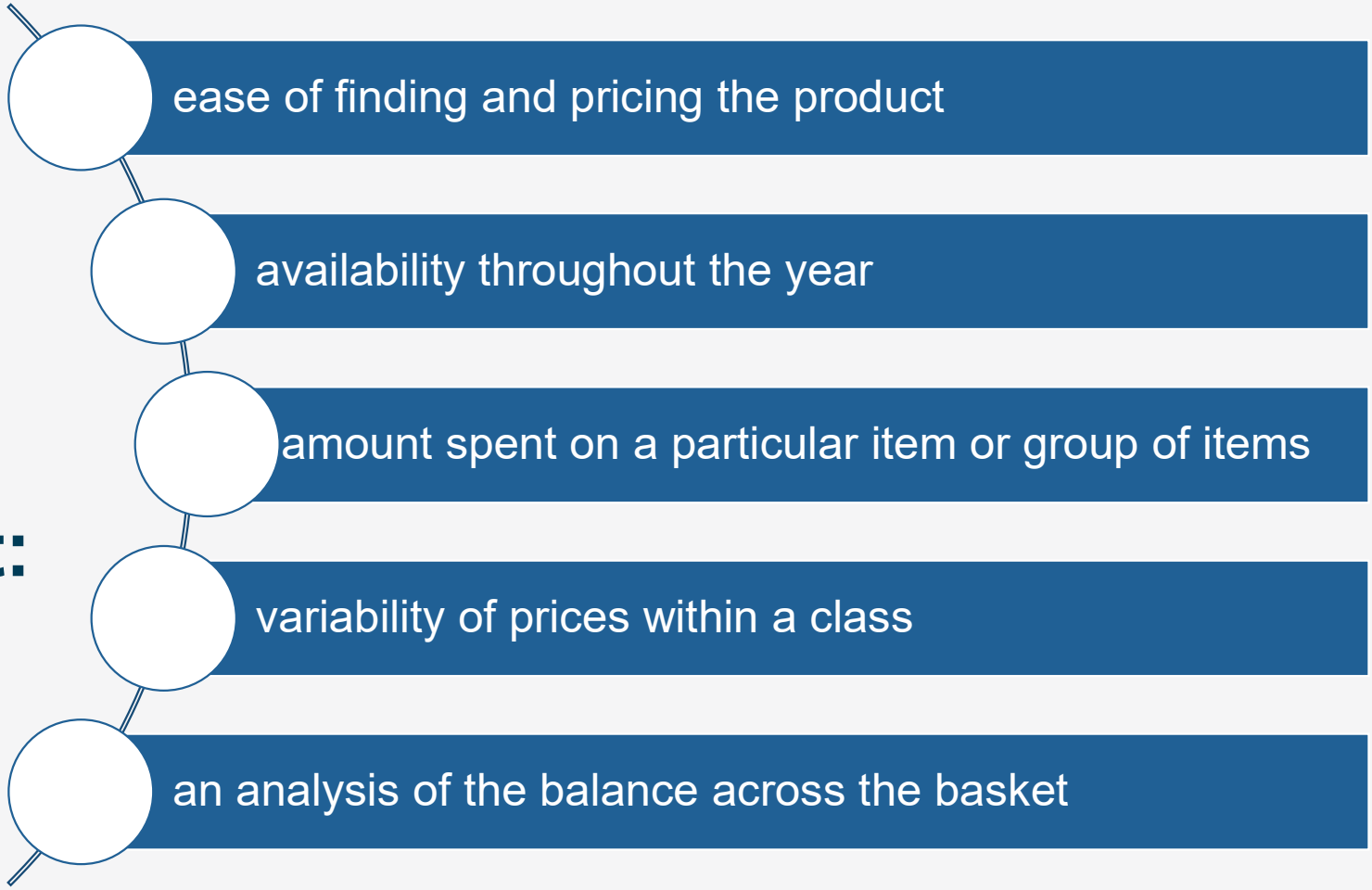
Lower-Level Weights

- Similar concept to higher level weights, but data sources less comprehensive
- Greater need to pull in other data sources (i.e. market research/intelligence data)
- No price updating
- Can take 3-year average to smooth out volatility at lower level

Updating the fixed basket

The basket is updated annually to keep it relevant.

Deciding what items are included in the basket:



Deep dive into difficult price items

Hotels

- Overnight hotel accommodation priced the day before nominal stay
  - Volatile pricing
  - Reduced number of quotes
- Overnight hotel accommodation priced six weeks before nominal stay
  - Introduced February 2025
  - Reduced the effect of traditional item by halving the weight

Package holidays

- Non-standard price relative methodology
  - Holidays in August are different from the same holiday in February
- Use an all-year index based on 8 items:
  - Six foreign holiday items, each stratified by operator and country
  - Two UK holiday items, stratified by region and type
- Compare prices with previous year to produce price relative for month
- Weight monthly price relative with previous months to produce index
- Price included in index when holiday is taken, not when booked or paid
- Methodology: Consumer Prices Indices Technical Manual, Chapter 9

Hairdressing and personal grooming services

- Three hairdressing items
  - Man's haircut
  - Woman's cut and blow dry
  - Woman's highlighting
- Two other personal services:
  - Slimming club subscriptions
  - Manicure
- Four items collected locally across the country, slimming clubs collected centrally
- Local collection on tablets with "help screens"

Mobile phone charges

- User profiles costed against a range of packages
  - Profiles defined by voice, text and data usage
  - Packages stratified by network and by PAYG/monthly contract/SIM only
- Within each stratum, the cheapest priced package that meets the user profile is used in constructing the index
  - For PAYG customers, the indices are based on price change between current month and January
  - For monthly contracts, customers are locked into a longer-term contract – assume 2 years
  - Each month, 1/24 of the sample can change their package, the remainder are tied into their existing contract
  - Similarly, SIM only contracts are assumed to run over a year and 1/12 change each month
  - Annual uplift in prices
- Methodology: Consumer Prices Indices Technical Manual, Chapter 9

Internet charges & bundled telecom services

- Two items included in Communication division of CPI
- Internet subscription charges
- Bundled telecommunication services – 2 or 3 services
- Subscriptions for various packages across a range of providers are priced
- Look past introductory deals

Gas & electricity

Variable tariffs

- Index based on a standard bill for a variety of popular tariffs
- Usage figures applied to unit costs (pence per kWh)
- Add in standing charge
- Apply VAT
- Tariffs defined by company, region, payment method & standard/economy 7

Fixed tariffs

- Items introduced in February 2025
- Covers 1-year tariffs paid by direct debit
- Index based on standard bills but averaged over 12 months
- Essentially we are using a moving average with 1/12 of the sample changing each month

Live music

- Item tracks the admission prices to live music events across the country
- Sample stratified by major venues, other venues and festivals
- Sample specified by the venue, not by the acts appearing
- Each month, prices are collected for a representative act appearing in a set venue
- Specific concert chosen is based on popularity and style of music – aiming for consistency with previous months

- Festivals occur in warmer months and the index construction is based on price change against the previous year
- No stadium concerts included

Motor vehicle insurance

- New policies only, no renewals
- Quoted policy prices rather than actual transacted prices
- Policies for a diverse range of people (varying by age, gender, occupation, etc.) and cars (make, model, age, milage etc.)
- Policies providing a range of benefits
- Like for like policies
- 3rd party data supplier use web-scraping technology to collect from insurer's websites for our 'profiles'
- For each insurer we create a 'comprehensive' and '3rd party' index
- Combine into overall comprehensive and 3rd party index, and then overall weighted average index

Airfares

- Airfares are collected for a fixed set of routes and carriers
- Sample is stratified by destination – long-haul, European and domestic
- Prices are collected from the internet for return flights leaving on index day and returning 3 weeks, 2 weeks and 1 week later depending on destination
- Prices are collected for:
  - long-haul routes 1 month, 3 months and 6 months before travel
  - European routes 1 month and 3 months before travel
  - domestic routes1 month before travel
- Weights are based on information from the International Passenger Survey and Civil Aviation Authority
- Airfares index is released monthly
- Subindices and their weights are released once a year in March

Computer games

- Five items:
  - Computer games purchased over the internet
  - Computer game downloads
  - 3 x Computer games purchased from shops defined by platform
- Products selected based on positions in best-seller charts so it's the price movement of chart position that is tracked
- Results in increased variability across months due to changes in chart composition.
- Charts are used to avoid potential bias caused by tracking individual product prices

Seasonal adjustment and timing effects

Some motivation and context

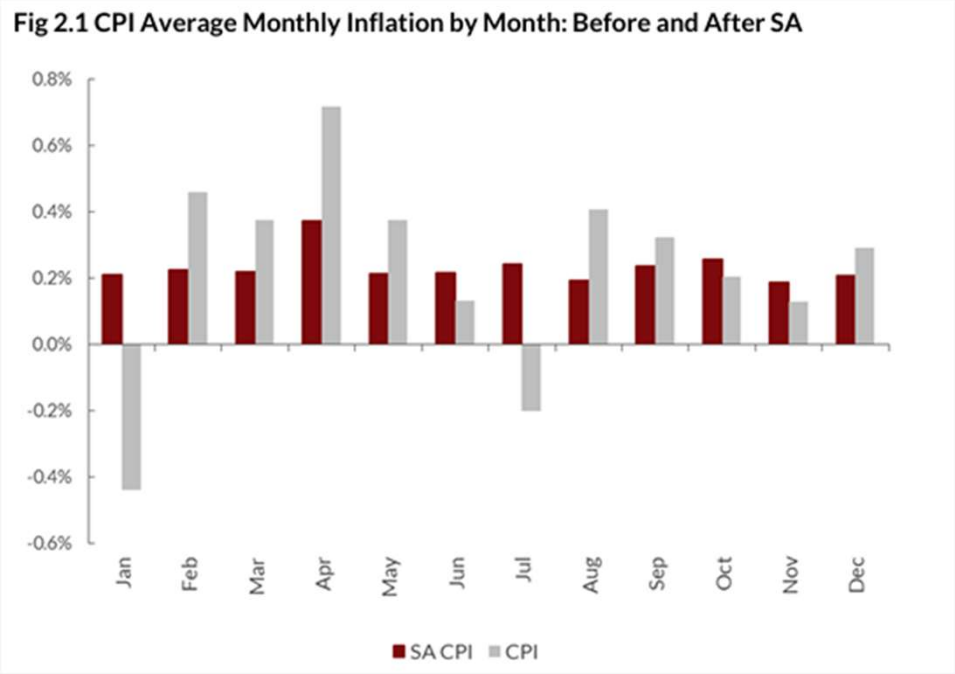
- There is user demand for the publication of some seasonally adjusted (SA) measures of CPI alongside the existing bulletin and tables
- Some users may value these as an additional signal of “underlying” CPI inflation. Many already produce their own versions.
- Many other national statistical institutes already do this, including the US, Australia, Canada, Japan and several EU member states
- ONS did produce something similar in the past, called “SARPIY”. This was introduced in the late 1990s and discontinued in early 2014
  - Using RPIY avoided difficult decisions about indirect tax changes and mortgage interest payments, but possibly reduced the visibility of the SA series

Recent developments

- ONS commissioned a recent report from the National Institute for Economic and Social Research into the feasibility of adjusting CPI and CPIH
- This is now published as NIESR Policy Paper 4.5, May 2025 and at https://niesr.ac.uk/wp-content/uploads/2025/05/PP45-Seasonal-adjustment-of-CPI-and-CPIH.pdf?ver=Fpa4ZyQ3TKJDLJjsRLe4
- We are extremely grateful to Huw Dixon and Monica George Michail for their hard work on this project and their constructive collaboration with ONS staff
- ONS has also discussed the feasibility of producing SA measures with our stakeholder advisory panel on consumer prices
- ONS is now reviewing its options and considering introducing some SA measures at some point in 2026

Some of the findings from NIESR's work

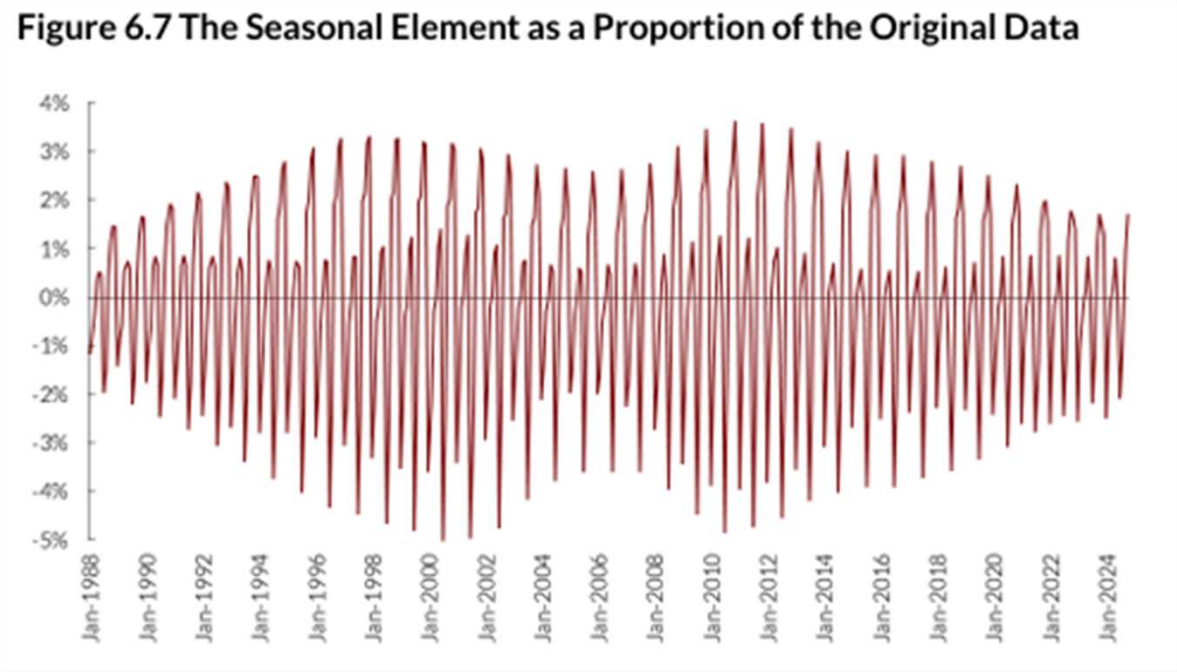
Monthly CPI outturns exhibit a clear seasonal pattern:



Source: Huw Dixon and Monica George Michail, NIESR Policy Paper 4.5, May 2025

Some of the findings from NIESR's work

There is some moving seasonality over the past 35 years:



Source: Huw Dixon and Monica George Michail, NIESR Policy Paper 4.5, May 2025

Open questions for any future implementation

Issue	NIESR recommendation
How many series to adjust?	At our request they worked down to COICOP four-digit series, but focused on CPI as a headline measure
How to treat known outliers such as large VAT and energy changes?	Strip out Division 4 (Utilities) and split the historical series into three shorter time periods
Whether to use direct or indirect adjustment?	Adjust series directly to ensure the best possible adjustment of headline CPI
Policy for revisions?	Revise the full series each month, but review model parameters somewhat less frequently. (Not all NSIs take the same approach here).
Presentation of results?	Focus on latest monthly growth rate of CPI SA, but give prominence to the non-seasonally adjusted data, incl. annual rate. This is similar to the BLS approach.

Revisions are small on average, but can be large

Table 4.1 Revision Triangles

	Median cumulative revision	As % of mean level	Largest absolute value
Normal	2016-2017		
Index	0.03	0.03%	0.082
Mom	0.02	10%	0.26
Turbulent	2023-2024		
Index	-0.03	0.02%	0.26
Mom	-0.02	10%	0.20
Annual	-0.003	0.06%	0.025

Source: Huw Dixon and Monica George Michail, NIESR Policy Paper 4.5, May 2025

This is an important consideration given the use of CPI in policy and indexation

Potential future work: calendar effects

- Detailed analysis of changes in the date of Easter was out of scope of NIESR's work. Easter can have an impact on prices in some divisions (air fares, holidays)
- We also suspect there are "index day" effects caused by the movement of our price collection dates backwards and forwards through the month
- There is the option to include these in published SA data. However, these would be more likely to affect 12-month inflation rates and hence create additional communication challenges

Most obvious example: air fares

This chart simply shows the level of air fares for successive years, with Jan=100 for each year. Note the large timing effects around Easter, and in July and December.

Possible points for discussion (to return to…)

1) How useful would it be to you if ONS were to publish seasonally adjusted measures of inflation? What would you use them for?

2) Do you have views on any of the implementation questions raised in this presentation?

3) Can you see any benefits to pursuing further work on more complex calendar effects as well as standard seasonal effects?

What are Input-Output tables?

- The input-output analytical tables (IOATs) are derived from the annual supply and use tables (SUTs), which are used to set the level of annual current price gross domestic product (GDP).
- The SUT's and the IOAT's provide a picture of the flows of products and services in the economy for a single year.
- They show flows of final and intermediate goods and services defined according to industry outputs (industry × industry tables) or according to product outputs (product × product tables).
- IOAT's have many use-cases such as understanding industry independencies, quantifying "ripple" effects, calculating multipliers, analysing trade patterns and supply chains, etc.

Using IOAT's to derive price intensities

Table 1: Restaurant main course

Price	**£16.00**	**100%**
Labour content	£8.00	50%
Import content	£2.00	11%
Capital (GOS & MI)	£3.50	23%
Taxes less subsidies	£2.50	16%
Energy content	**50p**	**3.2%**
Electricity	25p	1.6%
Gas	10p	0.6%
Refined petroleum	15p	1.0%

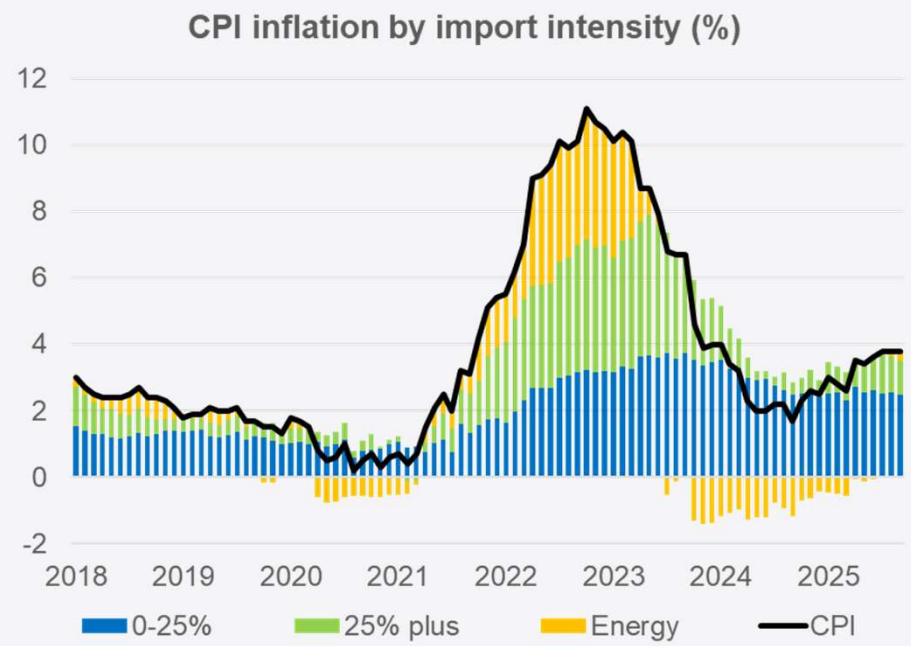
Note: *This is an illustrative example based on approximate data*

Table 2: Ranking by import intensity

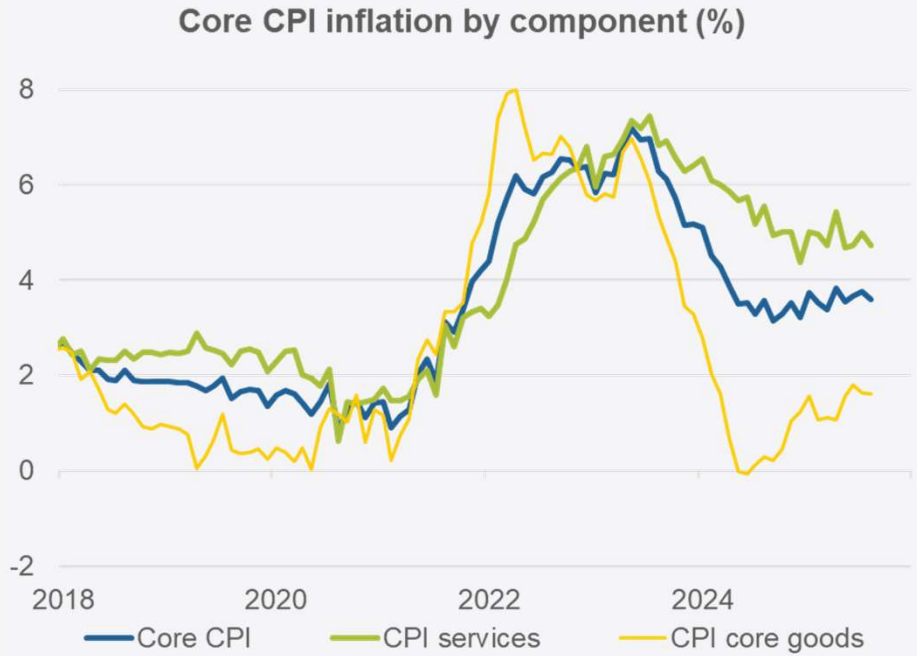
CPI class	
Education	6%
Rents	7%
Hospital services	10%
Restaurants and cafes	**11%**
…	…
Fruits and vegetables	52%
Footwear	53%
Telephones	56%
New and used cars	60%

Note: *This is an illustrative example based on approximate data*

The decline in inflation from peak was mainly led by energy and import intensive CPI items

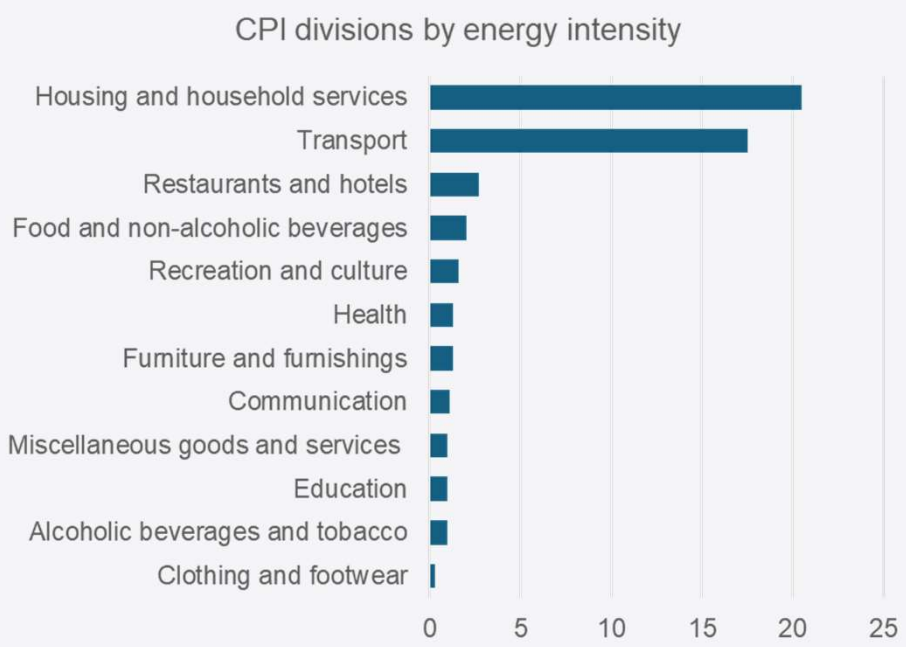


Source: Office for National Statistics

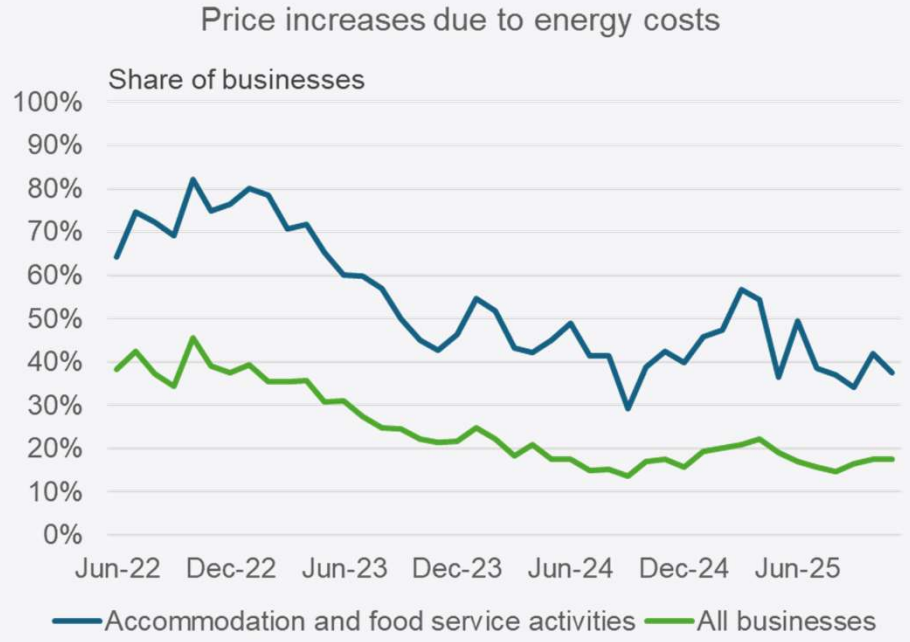


Source: Office for National Statistics

Restaurants and hotels have the highest energy intensity, excluding outright energy items



Source: Office for National Statistics



Source: Business Insights and Conditions Survey

Key takeaways

- Input-output analytical tables (IOAT's) are a useful framework for studying supply shocks, including import prices, energy prices, and labour costs
- Our analysis suggests that the decline in headline inflation from its peak in 2022 was mainly led by CPI items with a high import and/or energy content
- The inflation rate for more domestically-driven CPI components was more persistent, albeit it also edged lower in recent months

Question and Answer