

## **HICP and national CPI in Germany: as similar as possible, as different as needed\***

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\*) Underlying paper co-authored with Dilyana Popova and Patrick Schwind

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# Motivation and overview

**In Germany, the HICP co-exists with a national CPI as key measures for consumer price inflation.**

**Differences in HICP and CPI inflation may cause confusion in public perception though they are generally well explainable by different underlying statistical concepts and compilation methods.**

## **Content of this presentation:**

- **Similarities and differences of HICP and national CPI**
  - Concept, data and methodology
  - Empirical results in period 2021 – 2023
- **A look at two specific measurement issues and their impact on conformity**
  - Weighting (at the upper level of aggregation)
  - Owner-occupied housing (OOH)

# **Similarities and differences of HICP and national CPI**

# Similarities and differences of HICP and national CPI

## Concept, data and methodology (Destatis, 2023a, 2023b; Eurostat, 2024)

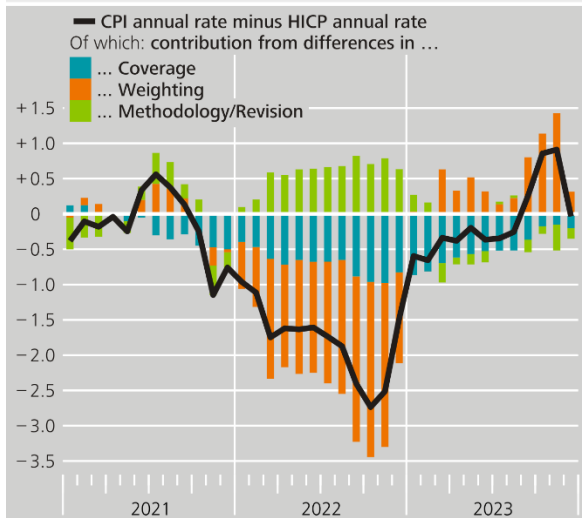
Criterion	CPI	HICP
Objectives	<p>Measure of consumer price inflation in Germany as a key macroeconomic indicator</p> <p><b>Compensation scale</b></p> <p><b>Deflating nominal values</b></p>	<p><b>Measure of price stability in ECB's monetary policy</b></p> <p>Indicator for assessing price convergence regarding a possible accession of a country to the monetary union</p> <p>Indexation of financial instruments</p>
Scope	Prices of all goods and services that are purchased by households in Germany	Prices of all purchased goods and services which are part of <b>household final monetary consumption expenditure</b>
Revision	At every base year changeover, recalculation applying the new weighting scheme as well as newly introduced methods and data back to January of new base year	Only in narrowly defined exceptional cases (e.g. errors, improved data sources and methods)
Index formula*)	<b>Laspeyres index, five-year base year changeover</b>	<b>Chain-linked Laspeyres-type index, annual weight adjustment</b>
Index concept*)	Cost-of-goods index (COGI)	
Elementary level	Data sources and methods	
* Upper aggregation level		

# Similarities and differences of HICP and national CPI

## Large deviations in 2022, caused mainly by differences in weights

### Difference between CPI and HICP inflation

Percentage points



Source: Own calculations based on data from the Federal Statistical Office.

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### Decomposition of the differences between CPI and HICP inflation

2021 – 2023

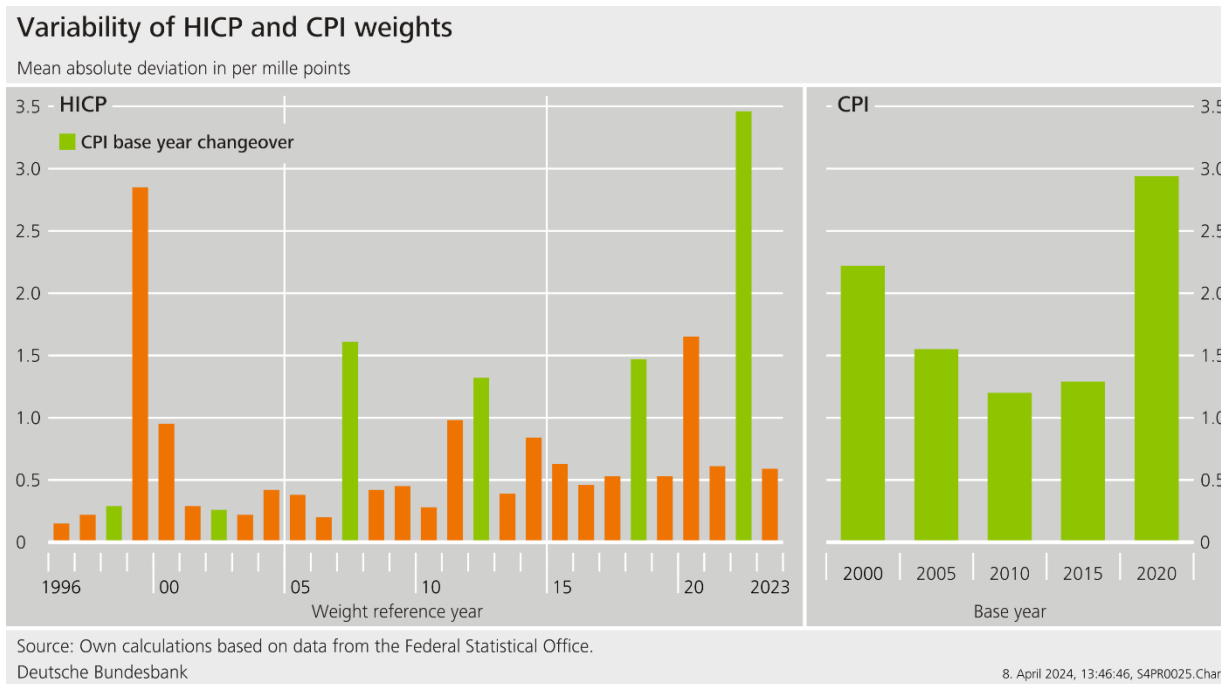
Position	Mean deviation (in pp)	Root mean squared deviation (in pp)	Share in mean squared deviation (in %)
Coverage	-0.5	0.6	23
Weighting	-0.4	1.1	89
Methodology/Revision	0.2	0.4	13
Covariance			-25
<b>Total</b>	<b>-0.7</b>	<b>1.1</b>	<b>100</b>

The methodology includes, for example, the use of different chain-linking methods for the CPI and HICP.

Measurement issue by which more conformity is achieved:  
**Weighting**

# Weighting as a measurement issue by which more conformity is achieved

## HICP weight shifts particularly large during CPI base year changeovers



Price index	Sample	Mean absolute deviation (in per mille points)
HICP	Total	0.8
	CPI base year changeovers	1.4
	Other years	0.6
CPI	Total	1.8

**Data:**

76 or 77 price components, mostly at the 4-digit level

# Weighting as a measurement issue by which more conformity is achieved

## Derivation of HICP weights (Elbel and Preißmann, 2012)

HICP weight of item  $h$  in year  $t$  (with price reference period  $t - 1, 12$ ):

$$w_{HICP,t-1,12}^h = w_{CPI,b}^h \times \frac{c_{t-\rho}^h}{c_b^h} \times \frac{p_{t-1,12}^h}{p_{t-\rho}^h} \quad \text{with} \quad \begin{cases} \rho = 2 & \text{for } 2012 \leq t < 2021 \\ \rho = 1 & \text{for } t \geq 2021 \end{cases}$$

where corresponding CPI weight refers to base year  $b < t - 1$ .

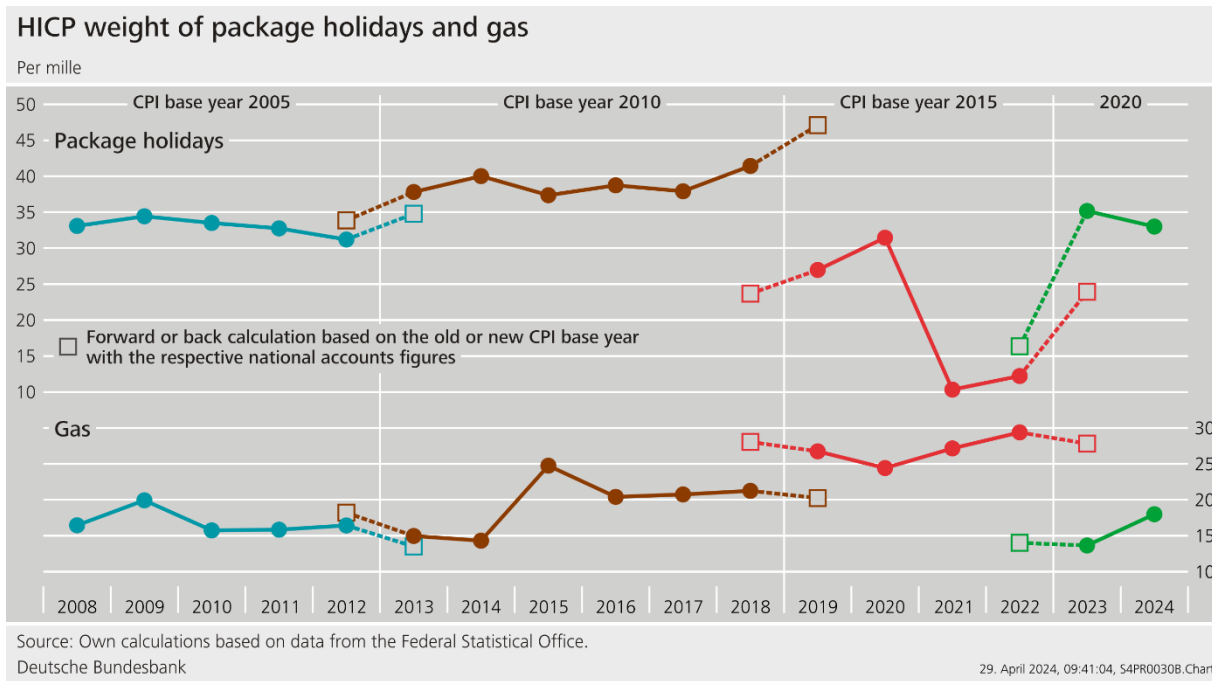
**1<sup>st</sup> step:** CPI weights are updated with national accounts consumption expenditure data up to penultimate year  $t - 2$  until 2020, and up to previous year  $t - 1$  since 2021.

**2<sup>nd</sup> step:** Price update to the price reference period (i.e. December of the previous year  $t - 1$ ).



# Weighting as a measurement issue by which more conformity is achieved

## Impact of CPI base year changeover on selected HICP item weights



Overall, change in **package holidays weight** largest from 2020 to 2021 and due to coronavirus pandemic.

Half of the strong upward shift of **package holiday weight** from 2022 to 2023 caused by CPI base year changeover.

**Gas weight** during the last CPI base year period relatively high.

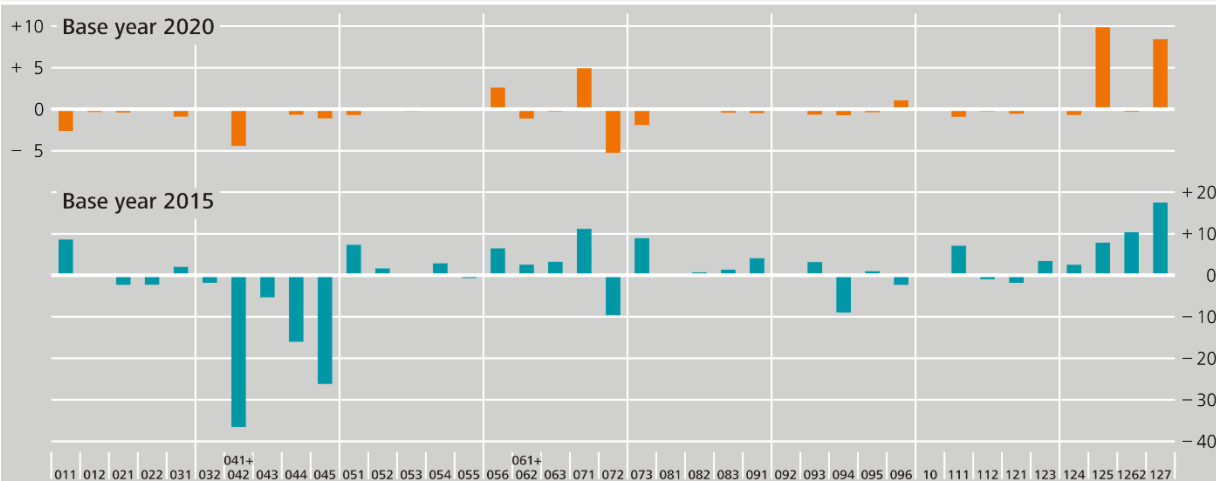
Decrease of **gas weight** from 2022 to 2023 due almost completely to base year-induced level correction.

# Weighting as a measurement issue by which more conformity is achieved

## CPI weights based on national accounts since last base year changeover

CPI weight and national accounts share\* of consumption expenditure items in comparison

Deviation of the CPI weight from the national accounts share in per mille points



\* Share of expenditure item according to the COICOP breakdown in total consumption expenditure as defined in CPI; data as per national accounts at the time of the respective base year changeover.

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### Difference between CPI weights and national accounts share

CPI base year	Primary source	Mean absolute deviation (in per mille points)
2020	NA	1.4
2015	HBS	5.9
2010	HBS	5.5
2005	HBS	5.3

NA = national accounts

HBS = household budget survey

### Data:

39 items, mostly at the 3-digit level

Measurement issue with less conformity (potentially) expected:  
**Owner-occupied housing (OOH)**

# OOH as measurement issue with less conformity (potentially) expected

## Current practice and criteria for choice of methodology

**Status quo:** In national **CPI** integrated by **rental equivalence** approach.

In **HICP** so far not integrated, but desired by users.

Outcome of 2020/2021 Monetary Policy Strategy Review (ECB, 2021):

- Integration improves representativeness and comparability.
- **(Net) acquisitions approach** is preferred method.

**Criteria for the choice of approach according to CPI Manual (ILO et al., 2020):**

- (1) Alignment with user needs and the main purpose,
- (2) Conceptual consistency (especially regarding the treatment of other durables),
- (3) Public acceptance,
- (4) Practicality of implementation.

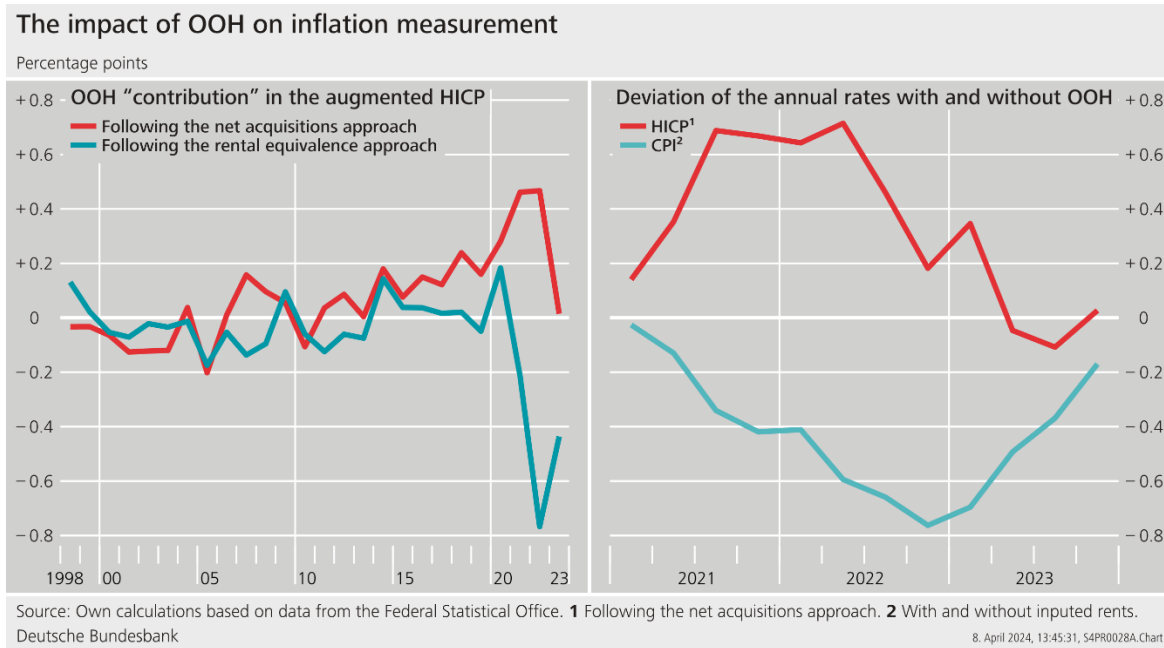
# OOH as measurement issue with less conformity (potentially) expected

## Justifying the use of different approaches

Criterion	CPI	HICP
Alignment with user needs and main purpose	<b>Deflating</b> nominal values is among the main purposes → <b>OOH costs</b> are accounted for in the <b>national accounts</b> via the rental equivalence approach	<b>Monetary policy</b> and <b>convergence assessment</b> are the clear main purposes → Reference to monetary consumption expenditure and observed prices speaks in favour of net acquisitions approach
Conceptual consistency	Rental equivalence approach is <b>not consistent</b> with the treatment of other durables	Net acquisitions approach is <b>consistent</b> with the treatment of other durables
Public acceptance	Rental equivalence approach is considered an <b>established measurement concept</b> in the CPI	In <b>public consultations</b> OOH costs were primarily put into the context of house or construction price developments
Practicality of implementation	Rental equivalence approach is well implemented in <b>Germany due to the large rental market und free pricing</b>	<b>Parallel publication in the interim phase</b> (monthly HICP and quarterly OOH-augmented HICP) is desirable for monetary policy

# OOH as measurement issue with less conformity (potentially) expected

## OOH-augmented HICP $\pm 1/4$ pp around HICP, with notable exception recently



### NA-based OOH-augmented HICP (analytical ECB indicator)

- Combination of HICP and OOHPI
  - Calculation of OOH weights using published data
- (see Eiglsperger et al., 2024)

### CPI with/without imputed rents

- Imputed rents shown as a separate item since last base year changeover

# Conclusion

# Conclusion

- **HICP and national CPI are based on the same granular price data and uniform compilation methods at the lower levels of aggregation. However, differences arise at the upper level concerning coverage, index formula, weighting schemes and revision practices.**
  - Strong deviations between HICP and CPI inflation in 2022 were largely due to differences in weights.
- **Weighting has long been a major source of differences. However, its impact is expected to diminish.**
  - National accounts have replaced household budget survey as dominant source for deriving CPI weights since last base year changeover. → Data source conformity with annual HICP weight updating achieved.
- **Measuring OOH in HICP and CPI using different approaches can generally be justified because their main purposes are different.**
  - Good communication is necessary – not least because OOH-augmented inflation measures may considerably deviate from each other. → Striking evidence in years 2021 and 2022.



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