

# Reference variables for analysing inflation in Spain

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## REFERENCE VARIABLES FOR ANALYSING INFLATION IN SPAIN

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### Abstract

This note analyses the main reasons why the Directorate General Economics, Statistics and Research of the Banco de España has recently adopted the Harmonised Index of Consumer Prices (HICP) and its associated measure of core inflation (the HICP excluding energy and food) as its reference variables for analysing inflation in Spain, instead of its previous practice of focusing on the consumer price index (CPI) and the CPI excluding unprocessed food and energy. The advantages in terms of communication and consistency with the other euro area countries and the European Central Bank (ECB) make it advisable to base the regular analysis of price developments on the harmonised measures. In any case, the CPI will continue to be analysed regularly, given its more extensive regional coverage and longer time series.

### Introduction

Consumer price indices are relevant for the analysis of inflation and, in particular, for the Eurosystem's multi-year projections.<sup>1</sup> Actual and expected inflation are key variables for economic agents when taking decisions in numerous areas, such as consumption, wage bargaining and on other kinds of contract. Moreover, many central banks, such as the ECB and the US Federal Reserve System, set their inflation targets in terms of these indices. In the case of Spain, the CPI<sup>2</sup> and the HICP are the main indicators for analysing and projecting inflation.

As the basis for its analysis and projections, the Banco de España currently uses the CPI and, as its measure of core inflation, the CPI excluding unprocessed food and energy. Moreover, the Banco de España's external communication on inflation developments also focuses on the CPI and the CPI excluding unprocessed food and energy, in particular its regular publications on the economic situation, such as the *Annual Report* and the *Quarterly Report on the Spanish Economy*, and its regular macroeconomic projections of the Spanish economy. Although HICP forecasts are regularly prepared within the Eurosystem framework, this index has traditionally played a secondary role in the Banco de España's external communication.

By contrast, the ECB's analysis and communication is focused on the HICP, while its main measure of core inflation is the HICP excluding energy and food,<sup>3</sup> which differs from the CPI excluding unprocessed food and energy insofar as the latter also includes processed food. Most Eurosystem national central banks follow the same practice.

The methodological discrepancies between the CPI and the CPI excluding unprocessed food and energy, on the one hand, and the HICP and the HICP excluding energy and food, on the other, are not very substantial,<sup>4</sup> and the signals extracted from the analysis of these

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1 Inflation forecasts are made in terms of the HICP within the framework of the four Eurosystem forecasting exercises. Medium-term projections, prepared in the Broad Macroeconomic Projection Exercises, are published in June and December each year, while shorter term projections, prepared in the "Narrow Inflation Projection Exercises", are published in March and September. For a description of these exercises see [A guide to the Eurosystem/ECB staff macroeconomic projection exercises](#).

2 Instituto Nacional de Estadística (2017) presents the CPI methodology, while Eurostat (2017) and Instituto Nacional de Estadística (2018) set out that of the HICP.

3 The ECB uses the acronym HICPX to refer to this index.

4 See Annex I.

	National CPI	HICP
Germany	--	X
Austria	--	X
Belgium	--	X
Spain	X	X
Finland	X	X
France	--	X
Greece	X	X
Ireland	X	X
Italy	X	X
Luxembourg	X	X
Netherlands	--	X
Portugal	--	X
United Kingdom	X	--

SOURCE: Banco de España.

two sets of indicators tend to be, on average, very similar. However, there is no guarantee that these measures will not differ at particular times or for certain components, potentially giving rise to confusion among the users of the analysis and of the Banco de España's publications. Given this background, the purpose of this note is to assess the advantages and disadvantages of adoption by the Banco de España of the HICP, and the HICP excluding energy and food, as reference variables for the analysis of inflation in Spain, instead of the customary practice of focusing on the CPI and the CPI excluding unprocessed food and energy.

### The measure of overall inflation

HICPs are calculated on the basis of definitions common to all EU countries. Use of the same methodology provides the best statistical basis for international comparisons of consumer price inflation across EU countries.<sup>5</sup> Table 1 presents the publication practices for projections of consumer price indices of a number of EU central banks. Notably, it can be seen that all the euro area countries publish predictions in terms of the HICP, as does the European Commission, for example. On the other hand, outside the euro area, the United Kingdom, for instance, publishes projections of its national index only. However, within the European Union, only a few countries, such as Italy and Ireland, publish, like Spain, projections in terms of the national CPI, while other countries, such as Germany and France only publish projections in terms of the HICP.

In accordance with the Treaty on the functioning of the European Union, the HICP is the reference measure of price stability. The ECB defines price stability as a year-on-year increase in the HICP for the euro area of below, but close to, 2% over the medium term. Also, countries aspiring to join the euro area must meet a price convergence criterion defined in terms of the HICP.

The HICP is also the reference measure for certain indicators of the European Union's macroeconomic imbalance procedure. This procedure is based on the calculation of

<sup>5</sup> Comparisons with countries outside the European Union, however, partly reflect methodological differences unrelated to price developments. For example, the US CPI considers imputed rents, unlike the HICP or the Spanish CPI.

various indicators of internal and external imbalances in the various economies. Among the latter, the real effective exchange rate criterion is based on calculations using the HICP for those countries that publish this statistic.

However, the CPI also has certain specific characteristics that are particularly useful for economic analysis. First, the CPI uses a definition of national spending, making it a more relevant measure for deflating real magnitudes for Spanish households. By contrast, the HICP uses a notion of domestic spending, i.e. the consumption basket is determined on the basis of spending in Spain, so that the spending of non-Spanish residents is also considered. As a result, the weighting of tourist-related items is lower in the Spanish CPI than in the HICP.

Second, the CPI is the measure normally used by Spanish private and public-sector analysts to monitor and project inflation in Spain.

Third, the CPI is published with a higher level of precision than the HICP. Specifically, the CPI is published to three decimal places, while the HICP is only available to two decimal places. This greater precision of the CPI means that the variability of the year-on-year rates is lower, as the variability arising from rounding disappears. The lower variability of the CPI also arises from the fact that tourism-related prices, which are particularly volatile, have lower weightings in the CPI than in the HICP.

The treatment of seasonal items (mainly clothing and footwear) differs between these indices. While in the CPI the prices of seasonal articles are left unchanged in those months in which they are not available, in the HICP their prices are estimated on the basis of the developments in the prices of the other products in the same category.<sup>6</sup> This entails greater dispersion of the rates of change of the HICP than of those of the CPI.<sup>7</sup>

Finally, the CPI provides more detailed information than the HICP on price developments, in particular, at the territorial level and over a longer period. Specifically, the CPI has not only national information but also, unlike the HICP, data for all the regions and provinces of Spain. Also, the available CPI time series cover a much longer period than those of the HICP. In the case of the CPI, the INE provides linked series dating back to 2002, with digital information available from 1976, while the HICP series have breaks when there was a change in methodology, and the official homogeneous series date back only as far as 2010.

Despite the methodological differences between the CPI and the HICP, these indices behave, on average, very similarly. Average inflation since 1995, according to the CPI, has been 2.35%, as compared with 2.34% according to the HICP. As is to be expected, the variability of the CPI is somewhat lower than that of the HICP. Specifically, the variance of the CPI over the same period was 2.38, as compared with 2.44 in the case of the HICP. Moreover, as seen in Chart 1, the time profile of these series is practically indistinguishable. In particular, the average absolute value of the month-to-month differences between the year-on-year rates of the overall CPI and HICP in the period considered is 0.1. Given the similarity of these two measures of overall inflation over the period considered, when inflation projections are made using the same information, very similar figures are obtained for the HICP and the CPI (see Chart 2).

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6 The seasonal clothing and footwear articles usually disappear at the end of the season, when the sales take place. As a result, it is very likely that the estimated price will be lower than the last price available, so that the increase in price when the article becomes available again in the new season will be greater.

7 The variance of the month-on-month rates is greater than in the case of the HICP.

## CONSUMER PRICE INDICES

CHART 1

1 OVERALL INDEX



2 CORE INFLATION

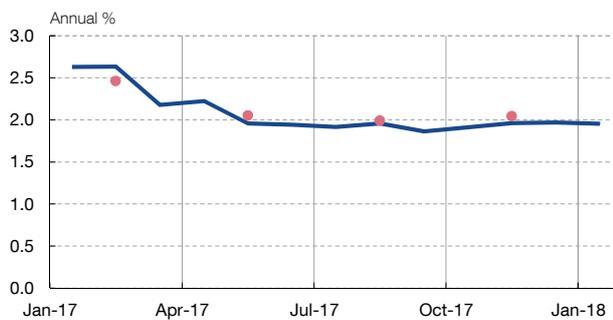


SOURCES: INE and Eurostat.

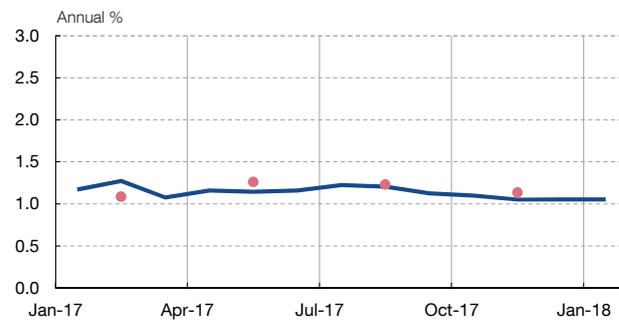
## INFLATION FORECASTS (a)

CHART 2

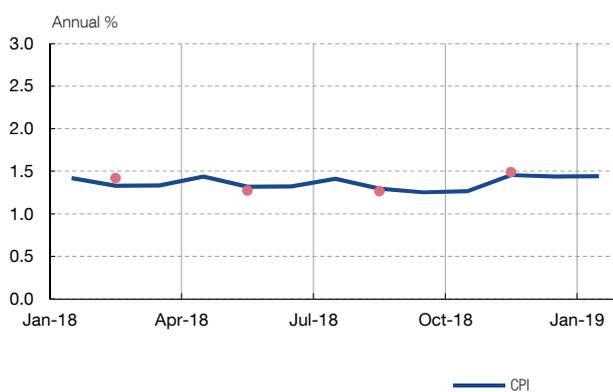
1 OVERALL INDEX FORECASTS (AVERAGE 2017)



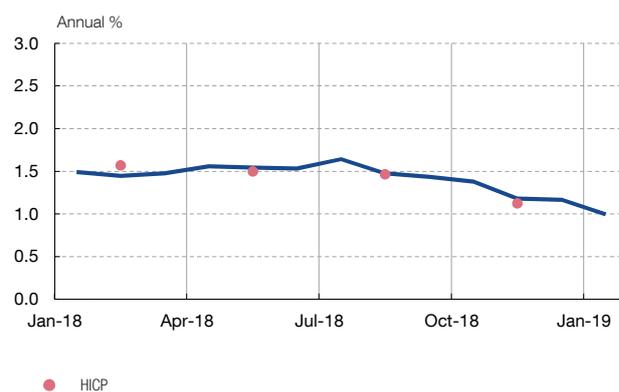
2 CORE INFLATION FORECASTS (AVERAGE 2017)



3 OVERALL INDEX FORECASTS (AVERAGE 2018)



4 CORE INFLATION FORECASTS (AVERAGE 2018)



SOURCE: Banco de España.

a HICP forecasts are prepared quarterly, within the framework of the Eurosystem's forecasting exercises.

### The measure of core inflation

Measures of core inflation exclude certain components of the overall index in order to reduce its variability and thus obtain a clearer trend signal of the trend in prices. Thus, the HICP excluding energy and food, unlike the CPI excluding unprocessed food and energy, does not include processed food. Although this type of measure is much less variable than the overall index, measures of core inflation cannot be considered to be measures of trend

	Core inflation	
	HICP excluding energy and food	Other measures
Germany	X	--
Austria	X	--
Belgium	X	--
Spain	--	CPI excluding unprocessed food and energy
Finland	X	--
France	--	--
Greece	X	--
Ireland	--	CPI excluding energy
Italy	X	--
Luxembourg	--	--
Netherlands	X	--
Portugal	X	--
Canada	X	X
United States	X	X
Japan	X	CPI excluding fresh food
United Kingdom	X	X

SOURCE: Banco de España.

inflation, owing to the existence of persistent changes in relative prices. For example, energy prices may increase at higher or lower rates than the overall index over a prolonged period. The average growth of the CPI between 1995 and 2018 was 2.35%, as compared with 2.08% in the case of the HICP excluding energy and food and 2.19% in that of the CPI excluding unprocessed food and energy. The figures in terms of the HICP are very similar.

The HICP excluding energy and food is somewhat less volatile than the CPI excluding unprocessed food and energy, since the prices of processed food tend to be more variable than those of services and industrial goods. Specifically, the relative variance of the HICP excluding energy and food with respect to the HICP, during the period 1995-2018, is 1.48, as against 1.61 in the case of the CPI excluding unprocessed food and energy with respect to the CPI. At the same time, the exclusion of more items from the HICP excluding energy and food means that it is a less representative measure of the trend in the overall index, in so far as the CPI excluding unprocessed food and energy covers 81% of spending, as compared with 66% in the case of the HICP excluding energy and food, if the national index is used, and 78% and 67%, respectively, in the case of the HICP.

The HICP excluding energy and food is the measure of core inflation used in the context of the ECB and the Eurosystem, and in many other countries. Only a few countries use different measures as their reference, such as the CPI excluding unprocessed food and energy (Spain), the CPI excluding energy (Ireland), and the CPI excluding fresh food (Japan). In the case of Spain, this measure has not only been used as a reference by the Banco de España, but also by different national analysts, and it is the one compiled and published by the INE (see Table 2).

Despite their composition differences, the behaviour of the HICP excluding energy and food is similar to that of the CPI excluding unprocessed food and energy. However, the CPI

1 NATIONAL CPI



— OVERALL INDEX EXCLUDING UNPROCESSED FOOD AND ENERGY

2 HICP



— OVERALL INDEX EXCLUDING ENERGY AND FOOD

SOURCES: INE, Eurostat and Banco de España.

excluding unprocessed food and energy has tended to display somewhat larger increases, on average, over the period 1995-2018 (2.19%, as against 2.08% for the HICP excluding energy and food), partly reflecting certain significant changes in relative prices, such as those that have at certain times affected items such as tobacco, with the pass-through of increases in taxation, and cooking oil, which has been significantly affected by supply conditions. In any event, the time profiles of these two series are closely related (see Chart 3).

14.9.2018.

## REFERENCES

- EUROPEAN CENTRAL BANK (2016), *A guide to the Eurosystem/ECB staff macroeconomic projection exercises*.  
 EUROSTAT (2017), *HICP Methodological Manual*.  
 INSTITUTO NACIONAL DE ESTADÍSTICA (2017), *Índice de Precios de Consumo. Base 2016. Metodología*.  
 INSTITUTO NACIONAL DE ESTADÍSTICA (2018), *Índice de Precios de Consumo Armonizado. Informe metodológico estandarizado*.

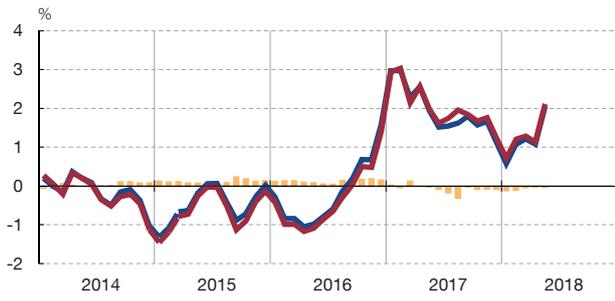
## Annex I. Methodological differences between the CPI and the HICP

The CPI and the HICP have a common methodology and production process. However, there are some differences, which are summarised below:

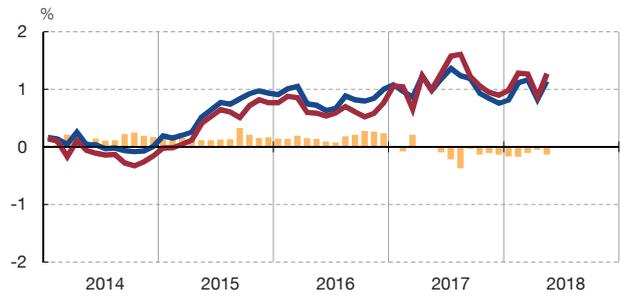
- 1 Coverage of goods and services. The HICP does not include gaming.
- 2 Geographical and population coverage. The HICP includes the spending of foreign visitors and excludes that of Spanish residents outside Spain, except their spending for business reasons. The HICP, unlike the CPI, includes the spending of persons who live permanently in collective households, such as residences and monasteries.
- 3 Treatment of seasonal items (mainly clothing and footwear). When the item is not available the last available price is left unchanged in the CPI, while in the HICP the price is estimated on the basis of the changes in the prices of items in the same category. This explains a large part of the discrepancy in the non-energy industrial goods rates in certain months. The monthly increases in clothing and footwear prices at the beginning of the season will be greater in the CPI, where the new season's price is compared with the last one available, usually a discounted sale price, while in the HICP it is compared with an estimated price.
- 4 Definition of special groups. In the case of the CPI an individual criterion is used, and therefore 479 items are allocated one by one to a special group. Eurostat, on the other hand, uses an aggregate criterion for the HICP, with all the items of a given subclass being allocated to a special group. Insofar as some classes, such as the food ones, contain goods and services or goods that belong to different special groups, different results will be obtained. These internal composition differences give rise to a large part of the differences in the published component rates.
- 5 Rounding system. The published CPI indices are rounded to three decimal places, while rates are calculated using all the decimal places of the indices. By contrast, the published HICP indices are rounded to two decimal places and rates are calculated using the published indices.

These methodological differences entail discrepancies in the rates of change of the CPI and the HICP. The average absolute value of the difference between the year-on-year rates of the overall CPI and HICP indices is 0.1 percentage point, although there is some disparity between the main components. The rates of the energy component barely differ, while the average absolute value of the discrepancies in processed foods, non-energy industrial goods and services is around 0.2 percentage points; in the case of unprocessed foods, it is 0.7 percentage point. However, no differences are discerned in the rates of change of food prices as a whole (see Chart A.1).

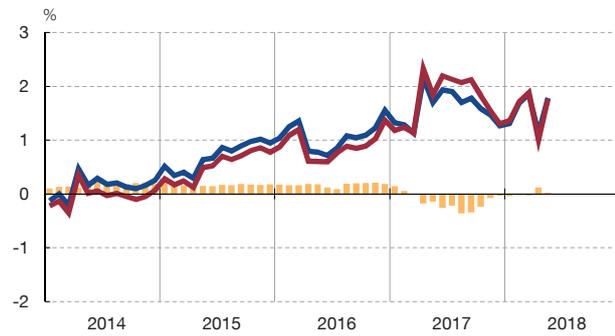
1 OVERALL INDEX



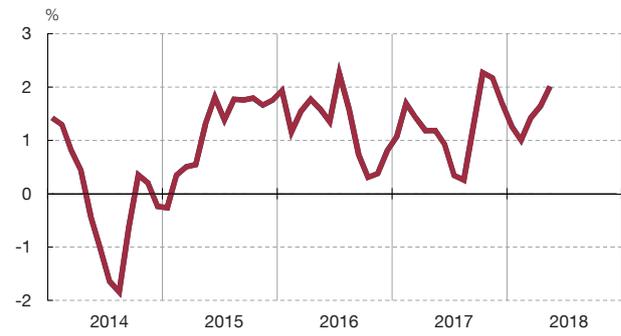
2 CPI EXCLUDING UNPROCESSED FOOD AND ENERGY



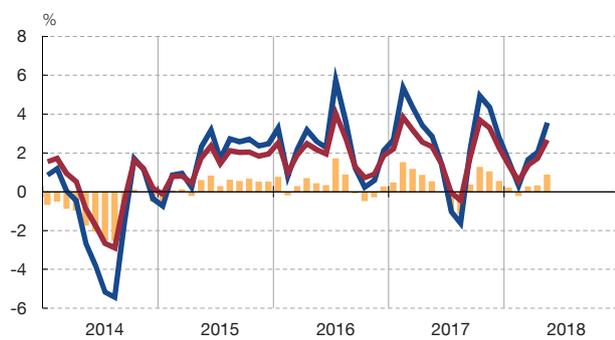
3 SERVICES



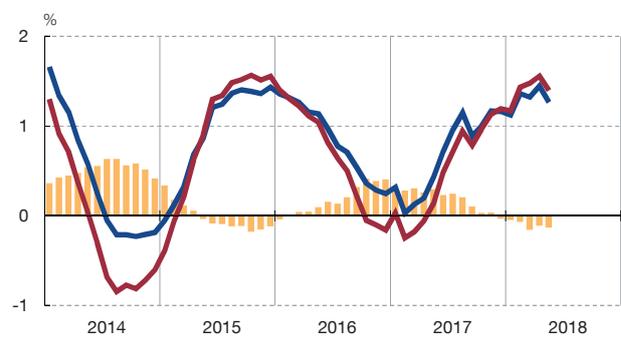
4 FOOD



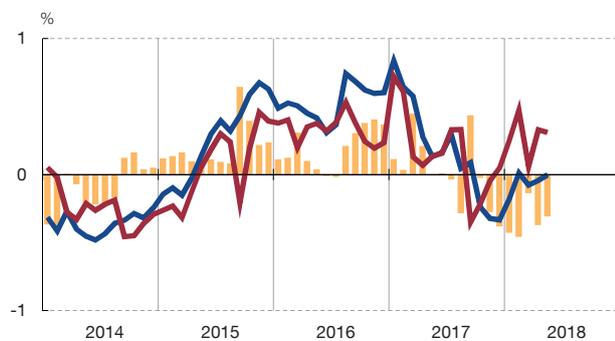
5 UNPROCESSED FOOD



6 PROCESSED FOOD



7 NON-ENERGY INDUSTRIAL GOODS



8 ENERGY



DIFFERENCE CPI HICP

SOURCES: INE and Eurostat.