

## Drivers of Spain's inflation in 2023: indirect effects and food

Our forecast for 2023 headline inflation in Spain has been revised downwards, from 4.5% to 4.2%, due to the impact of the lower energy prices. However, core inflation (the sum of services and industrial products) and food inflation will remain very high. This is because, from now on, our scenario contemplates that the main sources of inflation will be fuelled by the indirect effects of high energy prices on the non-energy components of the CPI and the sharp rise in production costs that the food-producing sectors are experiencing.

### The indirect effect of energy on inflation

Although the rise in energy prices made a U-turn in December (the energy component of the CPI registered a fall of 6.9% year-on-year) and we expect to see a decline in prices of 6.0% in 2023 on average, we estimate that energy prices will continue to add to inflation in 2023, albeit indirectly in this case. In particular, energy prices – which still remain high (20% above 2019 levels, according to the CPI) – have driven up production costs for many companies, which are being forced to pass on this increase in costs to their sales prices, at least partially.

To analyse the indirect impact of energy prices, we used the input-output tables for the Spanish economy to estimate the exposure to energy costs of the different categories of goods and services produced. By comparing this information with that of the categories of goods and services in the CPI, we classified the 92 components of the consumer index into products with a low, medium and high exposure to energy costs. To perform our analysis, we focused on the components of the core CPI, so we excluded energy products (for which energy prices naturally have a direct effect on the CPI) and food products (indirectly affected by energy, but more substantially by other cost shocks discussed later in this article). In addition, we excluded road and rail passenger transportation services, as intervention on their prices would skew our results.<sup>1</sup>

As shown in the first chart, according to our analysis, from December 2019 to December 2022 the median price increase for all products with a low exposure to energy costs was 5.3%, while in the case of products with a moderate exposure it was 7.1% and in those with a high exposure, 11.8%. If we calculate a price index for each group, using a weighted average according to the relative weight of each component in the CPI, we observe a similar dynamic. Thus, the price index of products with a low exposure registered a year-on-year increase of 2.9% in december; the moderate exposure index, an increase of 5.9%; and the high exposure index, 9.3%.

If we look at how these three clusters have contributed to core inflation (excluding public transport) in recent months, we see that it is the components most exposed to energy that are contributing the most to core inflation in proportion to their relative weight in the index. Specifically, in December 2022, the inflation of products with a high exposure contributed 0.9 pps to core inflation, which accounts for 19.5% of the observed inflation (which stood at 4.7%), double its relative weight in the index (9.8%).<sup>2</sup> On the other hand, products with a moderate exposure generated 48.7% of the core inflation (2.3 pps), while their relative weight in the index was 38.7%. The contribution of low-exposure products, which account for 51.5% of the core CPI, was just 31.7%.

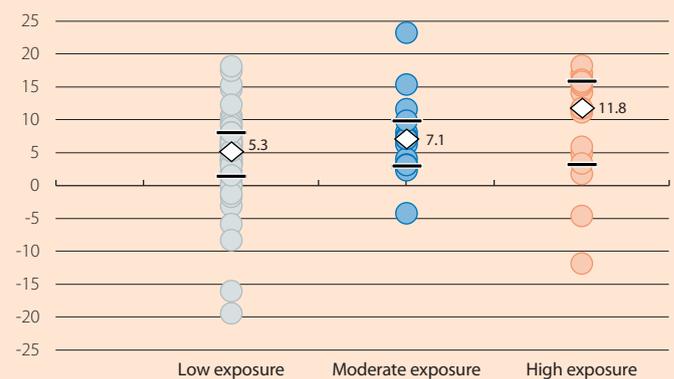
These results indicate that a large part of the core inflation we are currently experiencing is determined by energy prices. Given that energy prices are now moderating, we can expect that the impact of the indirect effects on the products most exposed to energy costs will not continue to escalate. However, due to the delay in the transmission of production cost increases to sales prices, we can expect the high inflation levels currently reached in the core components to persist during 2023.

1. To calculate the CPI's exposure to energy costs, we used a correspondence between the components of the CPI (ECOICOP) and the products in the input-output table (CPA). This was used to calculate the relative weight of the intermediate energy consumption in production for the sectors which produce the 92 components that make up the CPI basket. Low exposure is defined as those components with an energy consumption to production ratio below the median (2.4%), moderate exposure is those with a ratio lying between the median and the 75<sup>th</sup> percentile (between 2.4% and 4.1%) and high exposure is those with a ratio above 4.1%. If we exclude energy and food, as well as land, rail and combined passenger transportation, then the relative weights in the consumer basket of each group are as follows: low exposure, 51.5%; moderate exposure, 38.7%; and high exposure, 9.8%.

2. Full core inflation stood at 4.4% in December. Excluding road and rail passenger transportation services, inflation stands at 4.7%.

### Core CPI by component and by exposure to energy costs

Change between December 2019 and December 2022 (%)



Notes: The white diamond shapes show the median change, while the black bars mark the change in the 25th and 75th percentiles. For more information on the methodology, see note 1 of this article. Source: CaixaBank Research, based on data from the National Statistics Institute.

**The stress in food prices**

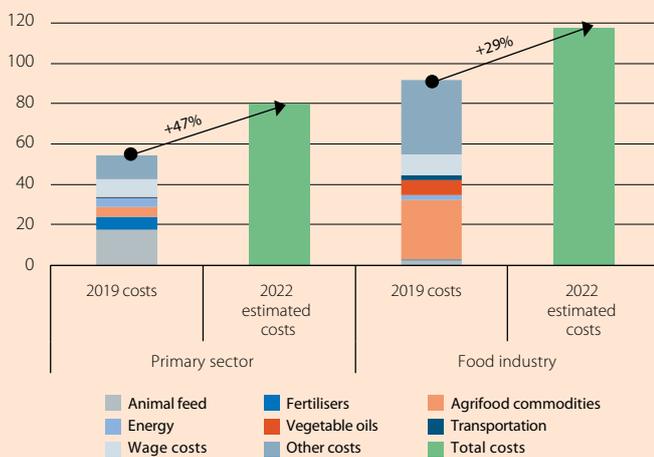
In our analysis of the indirect effects of energy, we left out food, because the rising costs that agrifood producers are currently experiencing go beyond the shock in energy costs, also reflecting other factors such as the rising cost of fertilisers (key for the primary sector) and vegetable oil (key in processed foods). This compounding of shocks has led to a situation in which, in December of last year, the prices of fresh foods registered an increase of 11.4% year-on-year, and those of processed foods, 16.4%, making them the components that contributed the most to headline inflation.

In the primary sector, we note that the significant rises in fertiliser and animal feed prices are pushing up consumer prices considerably. According to data from the input-output tables for 2019, the acquisition of these two products was the main cost of production for the primary sector, which spent 24% of its revenues on these purchases (18% on feed and 6% on fertilisers). According to data from the Ministry of Agriculture, Fisheries and Food's agricultural price observatory, in October 2022 animal feed prices had accumulated a 57% increase compared to October 2019, while fertiliser prices had more than doubled over the same period.

On the other hand, in the food industry we observe that two of the main items of intermediate consumption are agrifood commodities and vegetable oils, which are present in the vast majority of processed foods. In 2019 the industry dedicated 37% of its revenues to the purchase of these two types of products (30% to agricultural commodities and 7% to vegetable oils). The price increases of both products have also been significant. According to the aforementioned agricultural price observatory, the original selling price of vegetable oils rose by 68% between October 2019 and 2022, while the price of agrifood commodities increased by 53%.

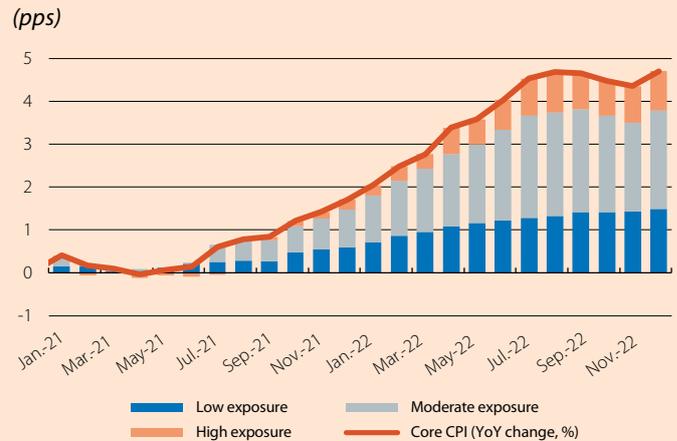
**Intermediate and wage costs of the food-producing sectors**

(% of production at base prices of 2019)



**Note:** The costs for 2022 are estimated based on the price increases compared to 2019 according to the Ministry of Agriculture, Fisheries and Food's agricultural price observatory: animal feed (+57%), fertilisers (+129%), agricultural commodities (+53%), energy (+91%), vegetable oils (+68%) and agricultural wages per day (+11%); the deflator of sales in the transport sector per the Spanish tax agency (+35%) and the increase in unit wage costs for the manufacturing industry per the National Statistics Institute (+5%).  
**Source:** CaixaBank Research, based on data from the National Statistics Institute, the Ministry of Agriculture, Fisheries and Food and the Spanish tax agency.

**Contribution to core inflation according to degree of exposure to energy costs**



**Notes:** The relative weights of each group in the core CPI are as follows: low exposure 51.5%, moderate exposure 38.7% and high exposure 9.8%. For more information on the methodology, see note 1 of this article.  
**Source:** CaixaBank Research, based on data from the National Statistics Institute.

As we show in the last chart, if we compare the information on the origin of the intermediate and wage costs of the agricultural and food sectors with the increase in prices of each product and the increase in unit labour costs in each sector, we see that, without taking into account the increase in costs of other products, the costs of both sectors would have increased substantially since 2019: by 47% in the agricultural sector and by 29% in the food industry.<sup>3</sup> Given that the aforementioned production costs have seen significant increases in recent months, we do not expect their effect on consumer prices to fade in the short term. Therefore, our forecast scenario contemplates that consumer food prices will continue to rise in 2023.

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3. The costs for 2022 are estimated based on the price increases compared to 2019 according to the Ministry of Agriculture, Fisheries and Food's agricultural price observatory: animal feed (+57%), fertilisers (+129%), agricultural commodities (+53%), energy (+91%), vegetable oils (+68%) and agricultural wages per day (+11%); the deflator of sales in the transport sector per the Spanish tax agency (+35%) and the increase in unit wage costs for the manufacturing industry per the National Statistics Institute (+5%). Increases in other costs are not taken into account, so this approach offers a result that could fall short of the reality.