

2023 inflation decomposition

This box shows the estimated decomposition of the deviation of the 2023 inflation rate – measured by the change in the Extended National Consumer Price Index (IPCA) – from the target set by the National Monetary Council (CMN).¹ The aim is to measure the contribution of the main factors determining inflation using semi-structural models from the Banco Central do Brasil (BCB).²

The deviation of inflation from the target is decomposed into six components: (i) inertia from the previous year (deviation of the previous year's inflation from the target);³ (ii) expectations (difference between inflation expectations measured by the Focus survey and the inflation target); (iii) imported inflation (difference from the target); (iv) output gap; (v) tax measures, including the reversal of the exemption on gasoline and ethanol; and (vi) other factors.⁴ These estimates are approximations built on models and are therefore subject to the uncertainties inherent to the modeling and estimation process.

The estimation of components relies on a scenario in which all conditioning factors are neutral, i.e., they have no impact that would lead inflation to deviate from the target.⁵ The contribution of each factor to the deviation of the inflation rate from the target is obtained when these neutral conditioning factors are replaced by the values observed.

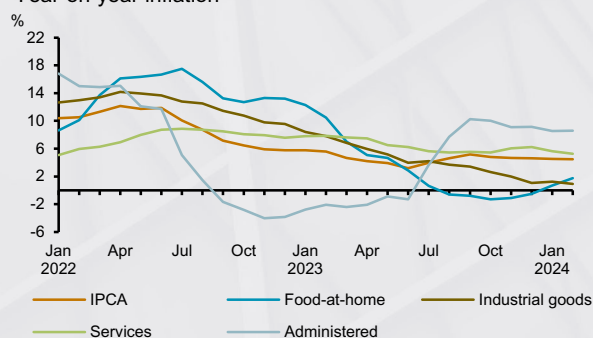
Inflation in 2023 was 4.62%, 1.37 p.p. above the 3.25% inflation target, within the tolerance range established by the CMN, of plus or minus 1.50 p.p. (Figure 1 and Table 1). Inflation was 1.16 p.p. lower than the 5.78% in 2022. Market prices inflation fell from 9.39% in 2022 to 3.14% in 2023, while administered prices inflation rose from -3.83% to 9.12%. Among market prices, services rose 6.22%, industrial goods increased 1.09%, and food-at-home fell 0.52%. Among administered prices, the contributions of gasoline, licensing and vehicle plates, health insurance, and residential electricity stood out.

Table 1 – Selected components of 2023 IPCA

Selected components and items	Change (%)	Weight (%)	Contribution to IPCA change (p.p.)
Market	3.14	75.20	2.36
Food-at-home	-0.52	16.04	-0.08
Industrial goods	1.10	24.16	0.27
Services	6.22	35.00	2.18
Administered prices	9.12	24.80	2.26
Gasoline	12.09	4.62	0.56
Licensing and vehicle plates	21.21	2.50	0.53
Health insurance	11.50	3.71	0.43
Residential electricity	9.51	3.88	0.37
IPCA	4.62	100.00	4.62

Sources: IBGE and BCB

Figure 1 – Inflation: IPCA and components
Year-on-year inflation



Sources: IBGE and BCB

- 1/ The inflation decomposition based on projection models has been presented annually in the Inflation Report. See, for example, box [“2022 inflation decomposition”](#), of the March 2023 IR. For details on methodological procedures, see box [“2017 inflation decomposition”](#), of the March 2018 IR, and Cusinato et. al (2016).
- 2/ See boxes [“Revision of the small-scale aggregate model”](#) of the December 2021 IR, and [“Revision of the medium-term projection models for administered prices”](#), of the September 2017 IR.
- 3/ The component “inertia from the previous year” includes the effects of all the factors affecting inflation until December 2022.
- 4/ The item “Other factors” includes factors not considered in the previous items, such as specific conditioning factors of the administered prices models and the model’s residual term. This box does not include the item concerning the effect of electricity tariff flags because those did not contribute to the inflation deviation from the target in 2023. The green flag had been in force since April 2022, with no impact on IPCA inflation throughout 2023.
- 5/ In the case of variables that exhibit seasonality, the neutral conditioning factors also include a seasonal component.

The main results of the decomposition are (Figure 2):

i. Inertia from the previous year (as a deviation from the target) contributed with 0.61 p.p. to the inflation deviation from the target due to high inflation in 2022, of 5.78%, affecting inflation in both market and administered prices. In the case of market prices, past inflation means current cost pressure, arising both from other prices of goods and services used as inputs and from informal inertial wage indexation mechanisms. Regarding administered prices, the emphasis is on institutional arrangements that link price adjustments to past inflation, especially health insurance and medicines;

ii. Inflation expectations (as a deviation from the target) contributed with 0.69 p.p. to the deviation of inflation from the target. Smoothed 12-month-ahead inflation expectations from the Focus survey started 2023 at around 5.3%, rose until early February, when they peaked at 5.7%, and then fell, ending the year at around 3.9% (Figure 3);

iii. Imported inflation (as deviation from the target) was the factor with the largest negative contribution to the inflation deviation from the target, -0.91 p.p. For this deviation, exchange rate appreciation contributed with -0.49 p.p. and the fall in the prices of oil and commodities in general contributed with -0.29 p.p. and -0.13 p.p., respectively (Figures 4 to 6);

Figure 2 – Contributions to the deviation of inflation from target in 2023

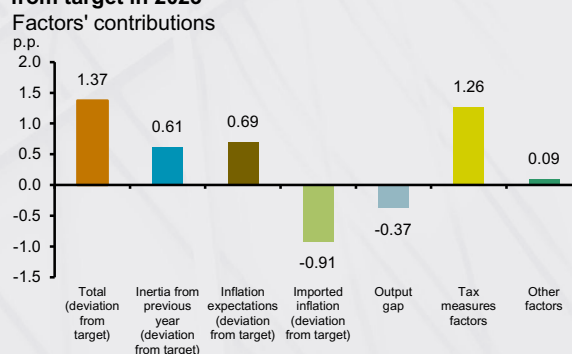


Figure 3 – 12-month ahead inflation expectations (smoothed) – Focus survey



Figure 4 – IC-Br (index in USD)

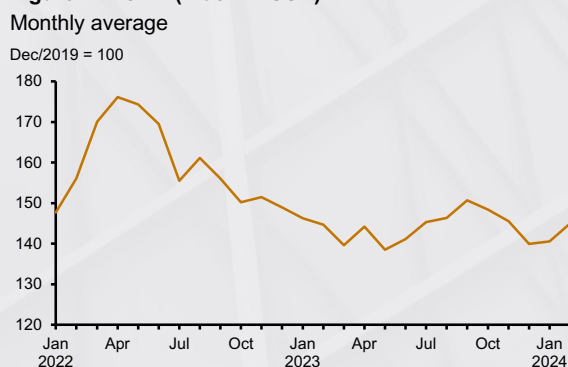
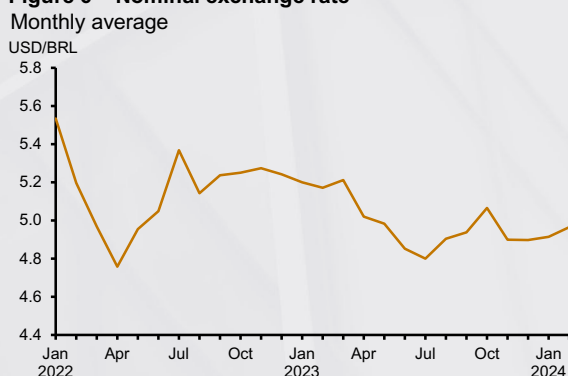


Figure 5 – Brent oil price



Sources: Bloomberg and BCB

Figure 6 – Nominal exchange rate



iv. The output gap contributed negatively to the inflation deviation from the target, -0.37 p.p. The output gap – an unobservable variable whose measurement is subject to high uncertainty – is measured by the BCB using different methodologies. Using the methodology based on Bayesian model estimation, the output gap, after a significant widening in 2020Q2 due to the Covid-19 pandemic, showed a narrowing trajectory in the subsequent periods. Throughout 2023, the output gap, still in a negative territory, contributed to reducing the deviation of inflation from the target;

v. The main contribution to the inflation deviation from the target (1.26 p.p.)⁶ came from tax measures, mainly involving the reinstatement of federal taxes and the increase in the State Tax on the Circulation of Goods and Services (ICMS) on fuels; and

vi. Lastly, the other factors contributed with 0.09 p.p. to the deviation of inflation from the target in 2023. Using the small-scale disaggregated model to capture the contribution of shocks by price groups, the negative contribution of shocks to food-at-home (-0.72 p.p.) and industrial goods (-0.40 p.p.) stood out, in contrast to 2022, when the contribution of shocks from these two groups was 1.01 p.p. and 1.13 p.p., respectively. In the opposite direction, shocks in administered prices contributed with 0.93 p.p.

In short, according to the decomposition presented in this box, the main factors that led inflation in 2023 to be above target were tax measures, inflation expectations, and the inertia of 2022 inflation. The fall in commodity prices, especially oil, the exchange rate appreciation, and the negative output gap acted in the opposite direction.

References

CUSINATO, R. T., FIGUEIREDO, F. M. R., MACHADO, V. G., MELLO, E. P. G. and PEREZ, L. P. (2016). "*Decomposição de Inflação: revisão da metodologia e resultados para 2012 a 2014*", Banco Central do Brasil, Working Paper 440.

6/ This estimate considers only the direct impact of the measures on the goods and services affected and incorporates only the share of the impact of the measures that would have materialized in consumer prices in the year of 2023. Therefore, the inertial effects of the 2022 tax exemptions in 2023 and the inertial effects of tax reinstatements throughout 2023 were not considered. This estimate does not come from the model, but from experts' analysis.