

This chapter analyzes the inflation outlook up to 2024, therefore covering all calendar years for which the National Monetary Council (CMN) sets inflation targets.

The inflation projections presented herein represent the Copom's view. These projections are generated using a set of models and available information, combined with judgment.

The inflation projections are conditional on a set of variables. In particular, the baseline scenario presented in this chapter uses as conditioning factors the trajectories of the Selic rate from the BCB's Focus survey, and the exchange rate based on the purchasing power parity theory (PPP)<sup>32</sup>.

The projections depend not only on hypotheses about interest and exchange rates, but also on a set of assumptions about the behavior of other exogenous variables. The projections are presented together with probability intervals that highlight the degree of uncertainty involved.

In this Inflation Report (IR), projections use data available up to the 241<sup>st</sup> Meeting of the Copom, held on September 21-22, 2021. As for the conditioning factors used in the projections, especially those from the Focus survey, the cut-off date is September 17, 2021, unless otherwise stated.

## 2.1 Revisions and short-term projections

Consumer inflation, as measured by the IPCA, surprised again in the quarter ended in August, standing at 1.10 p.p. above the baseline scenario presented in the June 2021 IR (Table 2.1.1).

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32/ For further details, see box "Exchange rate path in BCB projections and the purchasing power parity", of the September 2020 IR.

**Table 2.1.1 – Inflation surprise**

	% change				
	2021			Quarterly	12-month up to Aug.
	Jun	Jul	Aug		
Copom scenario <sup>1</sup>	0.62	0.39	0.26	1.28	8.50
Actual IPCA	0.53	0.96	0.87	2.38	9.68
Surprise	-0.09	0.57	0.61	1.10	1.18

Sources: IBGE and BCB

<sup>1/</sup> Scenario at the June 2021 Inflation Report cut-off date.**Table 2.1.2 – Short-term projection**

	% change				
	2021			Quarterly	12-month up to Nov.
	Sep	Oct	Nov		
Copom scenario <sup>1</sup>	1.11	0.45	0.41	1.98	9.22

Sources: IBGE and BCB

<sup>1/</sup> Scenario at cut-off date.

Inflationary pressure was also stronger than anticipated by market analysts<sup>33</sup>.

The upward inflationary surprise was quite widespread among the IPCA segments. Regarding administered prices, the surprise at the increase in oil-derived products<sup>34</sup> and electricity<sup>35</sup> prices more than offset the surprise at the drop in medicine prices and the sharp decrease in health plans rates<sup>36</sup>. Concerning food prices, it is highlighted the higher-than-expected rise in prices of animal proteins and fresh food, the latter reflecting unfavorable weather conditions<sup>37</sup>. The prices of industrial goods continue to show a more persistent-than-expected increase. Despite the widespread surprise among items in this segment, the price effects of products impacted by supply restrictions (vehicles) and by the recovery of mobility (clothing) were particularly important. Finally, the prices of services were also surprising, notably those that make up the underlying inflation of the segment, with rent and repairs of household items and automobiles standing out.

The Copom's short-term projections for the IPCA inflation in the baseline scenario stand at 1.11%, 0.45% and 0.41% for September, October, and November, respectively (Table 2.1.2). If confirmed, the inflation of 1.98% in the quarter will imply a slight decline in the 12-month inflation, from 9.68% in August to 9.22% in November.

The pressure on prices is expected to remain intense and widespread. The shock on industrial goods prices is not likely to dissipate in the short term, as suggested by recent indicators of producer prices and the continuing bottlenecks in the production chains that affect some segments. At the same time, services prices may remain on a normalizing trajectory, in line with the recovering demand of the sector. Thus, measures of underlying inflation should remain at a high level over this horizon. Furthermore, significant increases are also expected in food and administered prices, highlighting the sharp rise in

33/ The median of the inflation accumulated in June, July, and August projected by the Focus participants on June 11, 2021 was 1.19%. The percentiles 10 and 90 of the distribution were 0.83% and 1.46%, respectively.

34/ Besides the depreciation of the BRL and the increase in oil prices, it is worth noting that the prices of gasoline and LPG increased above that of oil on the international market. For the dynamics of the short-term projection, the international price of fuels is more relevant than that of oil.

35/ The increase in the value of the red flag 2, to BRL 9.492 per 100 kWh, was announced by Aneel on June 29, after the cut-off date and the release of the June 2021 IR.

36/ On July 8, the ANS established that individual health plans would have a maximum adjustment of -8.19% from May 2021 to April 2022. The IPCA incorporated this effect as of July, with a greater impact in the same month, considering that in this month were offset the variations relative to May and June.

37/ Notably the frosts that hit the country in July and the prolonged drought.

electricity fares resulting from the use of the “water scarcity” tariff flag.

## 2.2 Conditional projections

### Conditioning factors

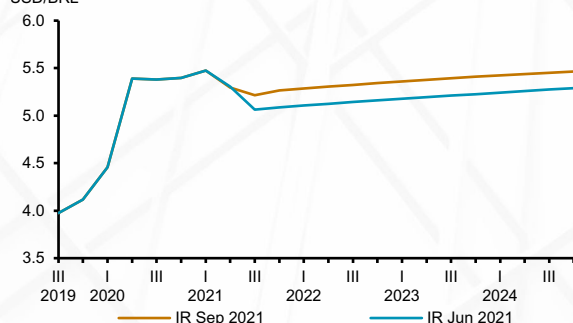
The baseline scenario for inflation is built using several conditioning factors. The exchange rate starts at USD/BRL 5.25<sup>38</sup>, above the value of USD/BRL 5.05 of the June 2021 IR, and follows a path according to the PPP<sup>39</sup> (Figure 2.2.1). The averages for the last quarters of 2021, 2022, 2023, and 2024 are USD/BRL 5.26, USD/BRL 5.34, USD/BRL 5.41, and USD/BRL 5.46, respectively.

In the case of the Selic rate, the median of expectations taken from the Focus survey of September 17, 2021, points to an increase from 5.25% p.a. to 6.25% p.a. at the September meeting, followed by additional 1.00 p.p. and 0.25 p.p. hikes in the subsequent meetings, increasing to 8.25% p.a. at the end of 2021 and reaching a peak of 8.50% p.a. in February 2022, remaining at this level until the end of the year (Figure 2.2.2). In this trajectory, the Selic rate starts to decline in the beginning of 2023, closing the year at 6.75% p.a. and reaching 6.50% p.a. at the end of 2024 and in 2025<sup>40</sup>. When compared with the survey used in the June 2021 IR, held on June 11, 2021, the Selic rate curve currently considered is higher over the entire projection horizon until the end of 2024<sup>41</sup>.

The baseline scenario also has assumptions for several other conditioning factors. The current level of economic uncertainty is expected to decrease over time. On the fiscal side, the 12-month central government primary balance, corrected by the economic cycle and by outliers, after reaching a minimum in 2020Q4, continues to improve over the entire projection horizon, more quickly throughout 2021. Commodity prices are also assumed to increase

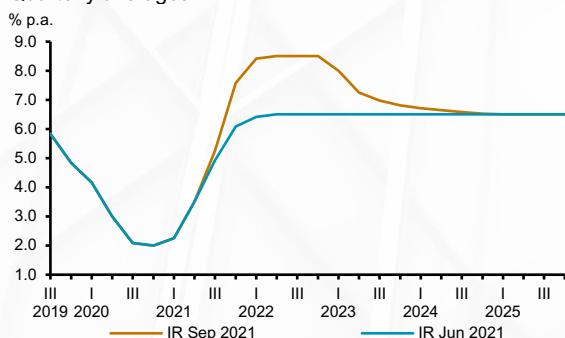
**Figure 2.2.1 – Exchange rate assumptions for projections – PPP trajectory**

Quarterly averages  
USD/BRL



**Figure 2.2.2 – Selic rate target assumptions for projections – Focus survey expectations**

Quarterly averages  
% p.a.



38/ Value obtained according to the usual procedure of rounding the average USD/BRL exchange rate observed on the five business days ending on the last day of the week before the Copom meeting.

39/ Taking into account the easiness in the formulation of projections and the simplicity of communication, the assumed inflation differential is the difference between the Brazilian inflation target for each year and the long-term external inflation, considered as 2% p.a., in line with the inflation target of most developed countries.

40/ As described in the boxes “New small-scale aggregate model with Bayesian estimation” and “Results from the new small-scale aggregate model with Bayesian estimation”, in the September and December 2020 IR, respectively, the Selic rate used in the IS curve refers to the trajectory one year ahead. Therefore, the interest rate over 2024 also depends on the Selic path over 2025.

41/ The construction of the Selic rate path in this scenario includes interpolation for the months in which the survey does not collect the respective data, using as reference the value of each year’s end.

over time. The neutral real interest rate assumed in the projections is 3.0% p.a. over the relevant horizon. The scenario also incorporates the *La Niña* phenomenon in the projections. As for the electricity tariff flag system for calendar-year ends, the “water scarcity” flag is used for 2021, as announced, and the red flag level 2 is used for 2022, 2023, and 2024, i.e., a neutral flag is assumed for the last two years.

The projections also depend on considerations about the evolution of necessary reforms and adjustments in the economy. Their effects on projections are captured through asset prices, the level of uncertainty, expectations from the Focus survey, and their effect on the economy’s structural interest rate. Besides these channels, the fiscal policy influences inflation conditional projections by affecting the aggregate demand.

## Inflation determinants

Inflation in 2021 has been strongly affected by a sharp increase of commodity prices, not counterbalanced by opposite movements in the exchange rate. Until August 2021, the IC-Br in USD increased 31.1% (33.7% in BRL) and the Brent oil rose 40.4% (43.3% in BRL). In comparison with January 2020, the month immediately prior to the start of the pandemic stress, the IC-Br in BRL grew 69.7%. Accumulated in the year up to August, the prices of gasoline, bottled gas, and ethanol in the IPCA grew 31.09%, 23.79%, and 40.75%, respectively<sup>42</sup>.

More recently, the energy crisis represented a new wave of shock of costs in the economy, through its effects on the tariff flag system. Accumulated in the year up to August, the price of household electricity increased 10.61% (17.16% in the period from May to August), and a new increase is expected in September due to the adoption of the “water scarcity” flag between September 2021 and April 2022. The bottlenecks in productive chains of some segments, especially the automotive, represent an additional negative supply factor.

Economic activity has been recovering after reaching a trough in 2020Q2, reflecting in different measures of the output gap. The output gap is an unobservable variable, subject to high uncertainty

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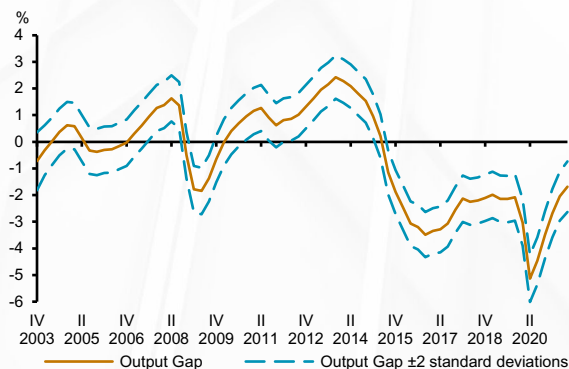
42/ Regarding the effect of conditioning factors on inflation projections changes for 2021, see the box “Impact of conditioning factors on inflation projections” in this IR.

in its measurement, and is measured by the BCB using different methodologies. This IR presents the output gap according to a methodology based on the estimation of the Bayesian model, described in the September and December 2020 IR<sup>43</sup>. In this estimation, the model introduces the output gap as an unobservable variable, whose trajectory incorporates information from four variables of economic activity referring to output in the economy and the idleness of production factors. Specifically, the estimation uses GDP, the Industry Installed Capacity Usage Level (Nuci) calculated by Fundação Getulio Vargas (FGV), the unemployment rate (measured by the Brazilian Institute of Geography and Statistics – IBGE) and net job openings measured by the General Registry of Employed and Unemployed Persons (Caged – Ministry of Labor and Social Security). It is noteworthy that the model adds economic structure to the estimation of the output gap trajectory by considering its relationship with market prices inflation, via the Phillips curve, and the IS curve itself.

According to this methodology, the estimation of the output gap continued its closing trajectory, going from -2.7% in 2021Q1 to -2.0% and -1.7% in 2021Q2 and 2021Q3, respectively<sup>44</sup> (Chart 2.2.3). The improvement in the economic activity variables has contributed to this behavior. The GDP, although relatively stable in 2021Q2, should continue on an upward trajectory. The unemployment rate, after reaching a peak at the beginning of the year, has been decreasing, with the most recently released figure for June standing out. Net job openings measured by the Caged continue to be positive and with significant numbers. Nuci, in turn, after a sharp recovery over the second half of 2020, has shown an oscillating movement, but with an increase tendency in recent months. In the baseline scenario, the gap keeps narrowing, although at a slower pace than in the previous IR scenario, mainly due to the increase in the trajectory of the Selic rate of the Focus survey. The interest rate path above neutral is an important limiting factor for closing the gap over the projection horizon. For example, at the end of 2022, the projection is for a still negative output gap, at -1.2%.

The increase in the Selic rate in the March, May, June and August meetings (0.75 p.p., 0.75 p.p., 0.75 p.p. and 1.00 p.p., respectively) and the expectations taken from the Focus survey of a continued increase act

**Figure 2.2.3 – Output gap estimates**

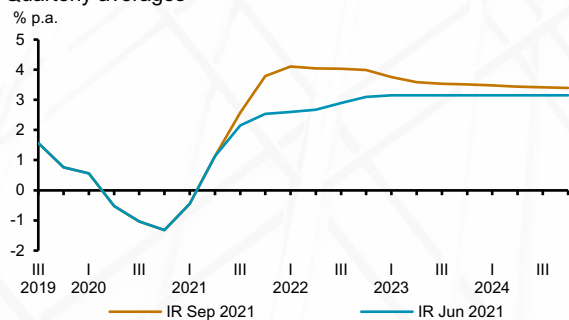


Note: Figure data: 2003Q4–2021Q3.

43/ See the boxes “New small-scale aggregate model with Bayesian estimation”, of the September 2020 IR and “Results from new small-scale aggregate model with Bayesian estimation” of the December 2020 IR.

44/ For 2021Q3, projections of these activity variables were used when data were not available.

**Figure 2.2.4 – Four-quarter-ahead real Selic**  
Quarterly averages

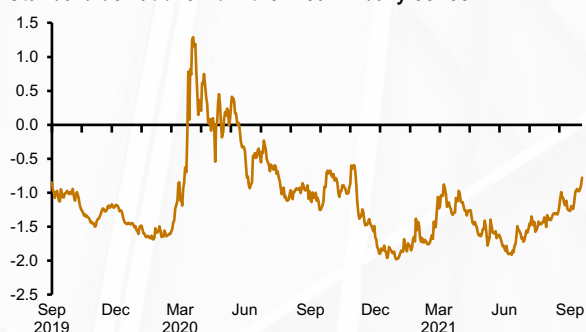


Note: Real Selic calculated as the four-quarter-ahead Selic rate, discounted from inflation expectations for the same period, both variables extracted from the Focus survey.

as a limiter for closing of the gap, helping to contain inflation and its expectations. Considering the Selic rate accumulated four quarters ahead, discounted from inflation expectations, both variables extracted from the Focus survey and measured in terms of quarterly averages, it is possible to see a sharp growth throughout 2021, stronger than that of the previous IR (Figure 2.2.4). From negative numbers at the beginning of the year, this variable reaches 3.8% p.a. in 2021Q4, above the neutral rate considered (3.0% p.a.), peaking at 4.1% p.a. in 2022Q1. This behavior reflects the sharper growth in the trajectory of the nominal Selic rate as compared to the increase in inflation expectations. In other words, the shift in the nominal yield curve from the Focus survey (Figure 2.2.2) also meant a rise in the real interest rate. On this path, the real rate basically stays at these levels throughout 2022, falling in the following years, but still remaining above the neutral real rate.

The levels of uncertainty in the economy, especially affected by the pandemic, have weighed negatively on the output gap. The acceleration of Covid-19 vaccination and the consequent significant reduction in pandemic-associated cases contribute to decrease uncertainty and boost demand for services, particularly hit by social distancing measures. The behavior of uncertainty will also depend on the assessment of the trajectory of such fiscal variables as the government spending, the primary balance, and the public debt.

**Figure 2.2.5 – Financial Conditions Index**  
Standard deviations from the mean – daily series

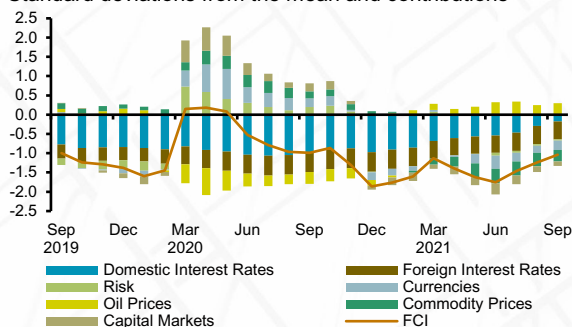


Note: The higher the value of the index, the more restrictive the financial conditions. Figure data: 9.3.2019–9.17.2021.

The Financial Conditions Indicator (FCI), calculated by the BCB, rose in 2021Q3, indicating more restrictive financial conditions compared with the previous IR (Figures 2.2.5 and 2.2.6)<sup>45</sup>. The main factors for the worsening of financial conditions were the rise in the future domestic interest rate and the drop in the stock market in Brazil. To a lesser extent, also contributed some reduction in the prices of agricultural commodities (CRB Foodstuffs), the appreciation of USD internationally, and the depreciation of the BRL. Few factors acted in the opposite direction, among them the drop in the yield of ten-year US Treasuries. It should be emphasized that the FCI reflects a series of elements, and should not be interpreted as an indicator of monetary stimulus or tightening. Moreover, the relationship of the indicator with inflation is ambiguous, as some of its components, such as those related to the risk

45/ By construction, the FCI is a dimensionless measure, with a zero mean and unit variance in the sample considered since January 2006. For a description of the methodology used in the calculation of the FCI, see box “Financial Conditions Indicator”, of the March 2020 IR.

**Figure 2.2.6 – Financial Conditions Index**  
Standard deviations from the mean and contributions



Note: The higher the value of the index, the more restrictive the financial conditions. Values refer to monthly averages. Sept/2021 value refers to the average until the 19th.

**Table 2.2.1 – Inflation projections – Scenario with Selic from Focus survey and PPP exchange rate**

Year-on-year IPCA inflation

Year	Qtr	Target	June IR	September IR	Difference (p.p.)
2021	III		8.0	10.2	2.2
2021	IV	3.75	5.8	8.5	2.7
2022	I		4.3	7.3	3.0
2022	II		3.5	6.0	2.5
2022	III		3.2	3.9	0.7
2022	IV	3.50	3.5	3.7	0.2
2023	I		3.7	3.6	-0.1
2023	II		3.6	3.9	0.3
2023	III		3.5	3.3	-0.2
2023	IV	3.25	3.3	3.2	-0.1
2024	I			3.0	
2024	II			2.9	
2024	III			2.8	
2024	IV	3.00		2.8	

premium and the exchange rate, are in general positively related with inflation and negatively related with activity. Therefore, more restrictive financial conditions point to a lower economic activity in the future, but may imply either higher or lower inflation, depending on what is inducing their movement.

Inflation expectations collected by the Focus survey increased significantly. Compared with the previous IR, the median of expectations for 2021 rose from 5.82% to 8.35%, and for 2022, from 3.78% to 4.10%. For 2023, expectations remain at the target of 3.25%.

## Inflation projections

The projections presented represent the Copom's view and are the result of the combination of the following elements: i. specialists' projections for market prices for shorter horizons and for administered prices up to a certain horizon; ii. use of macroeconomic models, satellite models, and specific models for administered price items; iii. use of certain trajectories for the conditioning variables; and iv. assessment on the state and prospects of the economy.

In the central projection, which combines the Selic rate from the Focus survey and the exchange rate following the PPP, the 4-quarter inflation peaks at 10.2% in 2021Q3, particularly affected by the electricity tariff flag change from red flag 2, in June (still lower than the new values effective as of July), to the "water scarcity" flag in September. Afterwards, projected inflation follows a declining path, ending 2021 at 8.5%, 3.25 p.p. above the tolerance interval (5.25%) of the inflation target (3.75%). Projected inflation falls to 3.7% in 2022, 3.2% in 2023, and 2.8% in 2024, in the face of inflation targets of 3.50% , 3,25%, and 3.00%, respectively (Tables 2.2.1 and 2.2.2 and Figure 2.2.7).

In terms of estimated probabilities that inflation exceeds the limits of the tolerance interval (Table 2.2.3), the highlight is the new increase in the probability of inflation surpassing the upper limit in 2021, which rose from 74% in the previous IR to close to 100% in this IR. The accumulated inflation in the year up to August is 5.67%.

In comparison with the previous IR, inflation projections rose for 2021 and 2022, and dropped

**Table 2.2.2 – Inflation projection and probability intervals – Scenario with Selic from Focus survey and PPP**  
Year-on-year IPCA inflation

Year	Qtr	Probability Intervals (%)						
		50%	30%	10%	Central	10%	30%	50%
2021	III	10.1	10.1	10.2	10.2	10.2	10.3	10.3
2021	IV	8.1	8.3	8.4	8.5	8.6	8.7	8.9
2022	I	6.7	7.0	7.2	7.3	7.4	7.6	7.9
2022	II	5.2	5.6	5.9	6.0	6.1	6.4	6.8
2022	III	3.0	3.4	3.7	3.9	4.1	4.4	4.8
2022	IV	2.8	3.2	3.5	3.7	3.9	4.2	4.6
2023	I	2.7	3.1	3.4	3.6	3.8	4.1	4.5
2023	II	3.0	3.4	3.7	3.9	4.1	4.4	4.8
2023	III	2.4	2.8	3.1	3.3	3.5	3.8	4.2
2023	IV	2.3	2.7	3.0	3.2	3.4	3.7	4.1
2024	I	2.1	2.5	2.8	3.0	3.2	3.5	3.9
2024	II	2.0	2.4	2.7	2.9	3.1	3.4	3.8
2024	III	1.9	2.3	2.6	2.8	3.0	3.3	3.7
2024	IV	1.9	2.3	2.6	2.8	3.0	3.3	3.7

for 2023 (Table 2.2.1). Specifically for 2021, the highlight is the actual inflation, which was 1.10 p.p. greater than predicted for the period between June and August, and the high short-term inflation projection (see Section 2.1) which extends to 2022 via inflationary inertia. For 2022 and 2023, it is noteworthy the more distant Selic rate trajectory from the values considered as neutral.

The main factors that led to the revision of the inflation projections are listed below.

**Main upward factors:**

- recent higher-than-expected actual inflation;
- revision of short-term projections, reflecting current pressures;
- propagation of current shocks via inflationary inertia;
- rise in commodity prices;
- exchange rate depreciation;
- higher inflation expectations in the Focus survey;
- better-than-expected evolution of some economic activity variables.

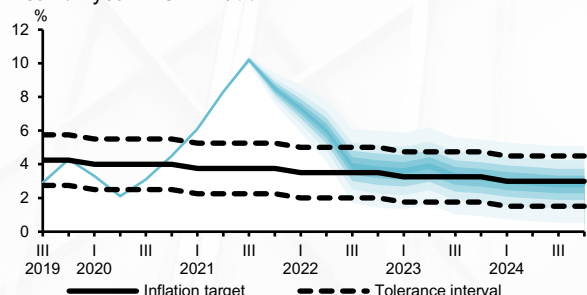
**Main downward factors:**

- higher trajectory of the Selic rate in the Focus survey, which represented a significant rise in the resulting real interest rate;
- fall in the economic uncertainty indicator at a slower pace than considered.

**Factor whose effect depends on the calendar year of the projection:**

- change in the assumption about the electricity tariff flag, increasing the projection for 2021 and decreasing for 2022.

**Figure 2.2.7 – Inflation projection and fan chart – Scenario with Selic from Focus survey and PPP**  
Year-on-year IPCA inflation



Note: The lines of the inflation target and the tolerance interval refer only to the calendar year, but, for better visualization, they are presented for all quarters.

**Table 2.2.3 – Estimated probabilities of inflation surpassing the target's tolerance interval**

Year	Lower limit	Probability of surpassing the lower limit	Upper limit	Probability of surpassing the upper limit
2021	2.25	0	5.25	100
2022	2.00	11	5.00	17
2023	1.75	15	4.75	13
2024	1.50	17	4.50	11

Note: Numbers rounded to the nearest integer value.

In comparison with the inflation projections of the 240<sup>th</sup> Meeting of the Copom held in August, there was an increase of 2.0 p.p. for 2021 and of 0.2 p.p. for 2022 and stability for 2023 (see Minutes of the 240<sup>th</sup> Meeting). The main factors were basically the same pointed out in comparison with the projections of the June 2021 IR.

When market and administered price groups are considered, it is observed a significant projection of 13.7% for administered price inflation in 2021 (Table 2.2.4). In terms of the calendar-year, the projection for 2021, if materialized, will be the highest inflation rate since 2015, when it reached 18.07%. Increases in the prices of gasoline, bottled gas, and electricity stand out. For 2022, the projection for administered



**Table 2.2.4 – Inflation projections of market and administered prices – Scenario with Selic from Focus survey and PPP exchange rate**

Year-on-year IPCA inflation

Year	IPCA	Market prices	Administered prices
2021	8.5	6.7	13.7
2022	3.7	3.5	4.2
2023	3.2	2.6	4.8
2024	2.8	2.5	3.4

prices reduces significantly, mainly reflecting the dissipation of the current shocks and the electricity tariff flag used. On the other hand, market prices inflation will reduce over time as inertial effects are dissipated and the path of the real interest rate used is above the neutral rate.

### Risks around the baseline scenario

Central projections involve various risks. The Copom, at its 241<sup>st</sup> meeting, highlighted the following risks:

- on the one hand, a possible reversion, even if partial, of the recent increase in the price of international commodities measured in local currency would produce a lower-than-projected inflation in the baseline scenario<sup>46</sup>;
- on the other hand, further extensions of fiscal policy responses to the pandemic that increase aggregate demand and deteriorate the fiscal path may pressure the country's risk premia. In spite of the recent improvement of debt sustainability indicators, the elevated fiscal risk creates an upward asymmetry in the balance of risks, i.e., in the direction of higher-than-expected paths for inflation over the relevant horizon for monetary policy.

An upward risk that also may be mentioned is a market perception about a possible earlier or more accelerated normalization of the monetary policy in the US, which could affect the price of domestic assets.

Finally, it should be highlighted that inflation over the projection horizon will be significantly affected by the evolution of the electricity tariff flag.

## 2.3 Monetary policy conduct and balance of risks

Regarding the global outlook, there are two additional risk factors to the growth of emerging economies. First, reductions in forecasts for growth in Asian economies, reflecting the evolution of the Covid-19 Delta variant. Second, a tightening of monetary conditions in various emerging economies,

<sup>46/</sup> See box "Risk scenarios for inflation projections: the US monetary policy and commodity prices projections" of the June 2021 IR.

as a reaction to recent inflation surprises. However, the long-lasting monetary stimuli and the reopening of major economies still sustain a favorable environment for emerging markets. The Committee continues to consider that a new round of market discussion regarding inflationary risks in advanced economies could result in a challenging environment for emerging economies.

Turning to the Brazilian economy, the second quarter GDP release as well as the most recent indicators continue to show a positive evolution and do not ensue relevant revisions in growth forecasts, which display a robust economic recovery during the second half of the year.

Consumer inflation remains high. Industrial goods price increases – due to higher input costs, supply restrictions, and redirecting of services demand towards goods – has not subsided and should remain a pressure in the short run. In addition, services inflation has accelerated in recent months, reflecting the gradual normalization of the sector, as expected. Finally, pressures persist in volatile components such as food and fuel prices and especially electricity fares, due to factors including the exchange rate, commodity prices, and adverse weather conditions.

The various measures of underlying inflation are above the range compatible with meeting the inflation target.

Inflation expectations for 2021, 2022, and 2023 collected by the Focus survey are around 8.3%, 4.1%, and 3.25%, respectively.

In its most recent meeting (241<sup>st</sup> meeting), Copom unanimously decided to increase the Selic rate by 1.00 percentage point, to 6.25% p.a. The Committee judges that this decision reflects its baseline scenario for prospective inflation, a higher-than-usual variance in the balance of risks and is consistent with the convergence of inflation to its target over the relevant horizon for monetary policy, which includes 2022 and, to a lesser extent, 2023. Without compromising its fundamental objective of ensuring price stability, this decision also implies smoothing of economic fluctuations and fosters full employment.

At that time, the Committee communicated that its baseline scenario for inflation encompasses risk factors in both directions. On the one hand, a possible

reversion, even if partial, of the recent increase in the price of international commodities measured in local currency would produce a lower-than-projected inflation in the baseline scenario. On the other hand, further extensions of fiscal policy responses to the pandemic that increase aggregate demand and deteriorate the fiscal path may pressure the country's risk premia. In spite of the recent improvement of debt sustainability indicators, the elevated fiscal risk creates an upward asymmetry in the balance of risks, i.e., in the direction of higher-than-expected paths for inflation over the relevant horizon for monetary policy.

The Committee considers that, at the present stage of the tightening cycle, this pace is the most appropriate to guarantee inflation convergence to the target at the relevant horizon and, simultaneously, allow the Committee to obtain more information regarding the state of the economy and the persistence of shocks. At this moment, the Copom's baseline scenario and balance of risks indicate as appropriate to advance the process of monetary tightening further into the restrictive territory.

For the next meeting, the Committee foresees another adjustment of the same magnitude. Copom emphasizes that its future policy steps could be adjusted to ensure the achievement of the inflation target and will depend on the evolution of economic activity, on the balance of risks, and on inflation expectations and projections for the relevant horizon for monetary policy.



## Impact of the conditioning factors on inflation projections

The Monetary Policy Committee (Copom) evaluates in its decision-making process a wide range of variables and models over which it exercises judgments based on the available information set, thus building inflation projections. These projections are conditional on the behavior of a set of exogenous variables, whose paths make up the prospective scenario of the economy and may come from satellite models, Copom's judgments, or other criteria. In this process, Copom defines a baseline scenario, presented in more detail in the Inflation Report (IR), and assesses the risks involved using several alternative scenarios, occasionally presented in boxes of the same IR.

This box revisits the projections presented in the baseline scenario of the December 2020 IR, as well as the conditional paths used for the exogenous variables at that time, using the most recent set of available information. A counterfactual scenario is created for the December 2020 IR, assuming the current paths for the exogenous variables, and the contribution of the main variables to the difference between projections for counterfactual and baseline scenarios is presented. In addition, changes in projections reported by the Pre-Copom Questionnaire (PCQ) participants between December 2020 and September 2021 are analyzed. Finally, the alternative scenario with rising oil prices published in a box in the June 2020 IR is also revisited.

### Impact of the conditioning factors on the inflation projections of the December 2020 IR

In the December 2020 IR, the central projection presented for the 2021 inflation was 3.4%. Following the usual procedure and in line with the experience of other central banks, this projection is the result of a combination of specialists' shorter-term forecasts, who use a large set of information, and model projections for longer horizons. This scenario was based on specific assumptions for the paths of the conditioning factors used in the projections. For example, the exchange rate started at USD/BRL 5.25 and followed a path according to the purchasing power parity (PPP), reaching USD/BRL 5.33 in 2021Q4; the Selic rate from the Focus survey remained at 2.00% p.a. until August 2021, increasing in the following months until reaching 3.00% p.a. at the end of the year; and inflation expectations for the year 2021, also calculated by the Focus survey, were at 3.3%. Among other factors, it was also assumed that commodity prices would rise over time, as well as a the red flag level 1 would prevail at the end of 2021<sup>1</sup>.

Over the year, the inflation projections for 2021 underwent a revision process, incorporating new available information, and reached 8.5% in the baseline scenario in this IR. New information includes both the release of new data for inflation and exogenous variables, as well as the update of the future paths of these latter variables. As highlighted in the IRs throughout the year, several factors contributed to the revision of projections.

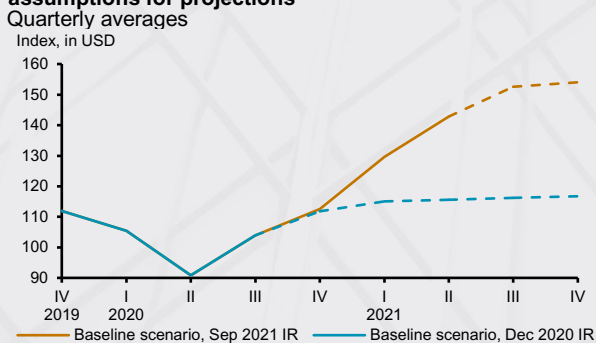
Among the changes in the conditioning factors, the rise in commodity prices was stronger than that considered in the baseline scenario (Figures 1 and 2), with a 36.5% growth in the Commodities Index – Brazil

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1/ See section "2.1 Revisions and short-term projections", and section "2.2 Conditional projections", subsection "Conditioning factors" of the December 2020 IR.

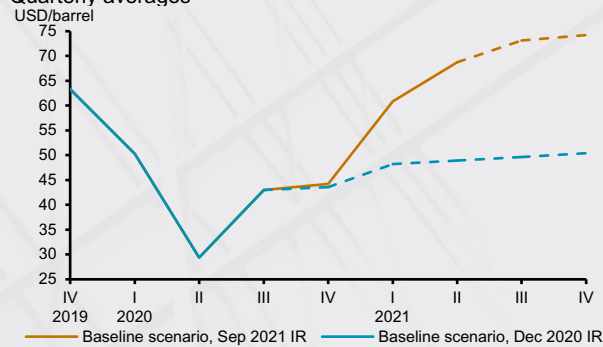
(IC-Br) measured in USD between November 2020 and August 2021<sup>2</sup> and an increase of about 60.3% in the price of Brent oil in the same period. The growth of inflation expectations from the Focus survey (Figure 3) is also noteworthy, with an increase in smoothed expected inflation twelve months ahead from 4.09% to 4.93% between the cut-off dates of the December 2020 and the current IR. In addition, household electricity projections now consider the water scarcity tariff flag from September to December 2021. The exchange rate, in turn, went through movements of depreciation and appreciation over time (Figure 4).

**Figure 1 – Commodities Index – Brazil (IC-Br) in USD assumptions for projections**



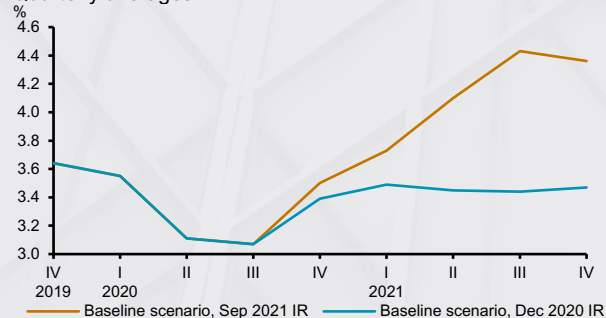
Obs.: Solid lines represent actual data and dashed lines, conditioning data.

**Figure 2 – Brent oil price assumptions for projections**



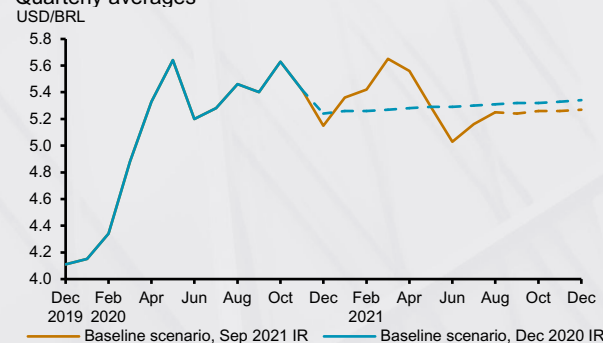
Obs.: Solid lines represent actual data and dashed lines, conditioning data.

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



Obs.: 12-month-ahead inflation expectations for each period compiled based on monthly and annual expectations as of each cut-off date.

**Figure 4 – Exchange rate assumptions for projections**



Obs.: Solid lines represent actual data and dashed lines, conditioning data.

To assess the impact on inflation projections of differences between the conditioning factors originally used in the baseline scenario and their current paths, which include actual values, a counterfactual scenario was built for the December 2020 IR, using the aggregate semi-structural model and assuming the current paths for the conditioning factors<sup>3</sup>. In this counterfactual scenario, the inflation projection for the year 2021 is 7.8%, presenting an increase of 4.4 p.p. when compared with the baseline scenario of December 2020 (Table 1 and Figure 5). To understand the reasons for this change, one can analyze the contribution of the different variables<sup>4</sup>. The updating of the path of variables fuel<sup>5</sup>, electricity flags and IC-Br contributed with 2.3 p.p.,

2/ The IC-Br aggregates, in a weighted manner, the indicators relative to the Agriculture and Livestock, Metal and Energy segments, and thus this index is also affected by international fuel prices (Brent oil, natural gas, and coal).

3/ The counterfactual scenario assumes that the short-term expert projections incorporated into the original baseline scenario have the same sensitivity to conditioning variables as the model used for the medium-term projections. Furthermore, Focus inflation expectations are assumed to respond to updates of the conditioning variables, according to the model's inflation expectations equation. See boxes "New small-scale aggregate model with Bayesian estimation", of the September 2020 IR, and "Results from the new small-scale aggregate model with Bayesian estimation", of the December 2020 IR.

4/ To obtain such contributions, each variable analyzed was considered as an exogenous variable, unaffected by the other variables in the model, except for the Focus inflation expectations, as highlighted in the previous footnote. Thus, the calculated contribution for expectations corresponds to the portion of the expectations update not explained by the updating of the other conditioning variables.

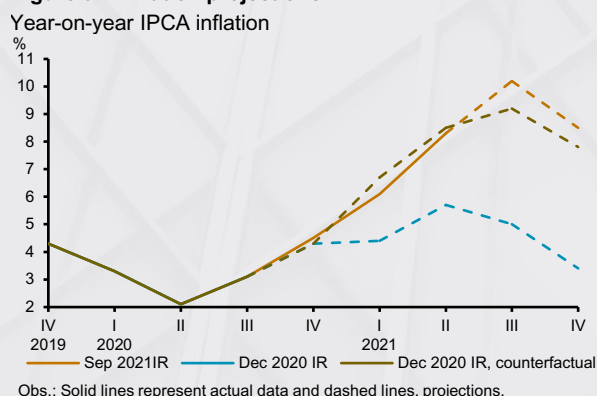
5/ The fuel contribution is composed of two parts: one corresponding to the impact of oil price updates on the fuels included in the administered prices, such as gasoline and bottled gas, and the other referring to the impact on hydrous ethanol, which is part of market prices.

1.0 p.p. and 0.6 p.p. to the increase of projections, respectively (Figure 6). Therefore, in this simulation, these cost shocks jointly contributed with 3.9 p.p. for the increase in the projections for 2021, equivalent to about 90% of the total increase in inflation projections<sup>6</sup>. Focus inflation expectations contributed with 0.3 p.p. In turn, the updating of the output gap, which comprises the impact of several conditioning factors, had a negative contribution of 0.4 p.p. The exchange rate update had practically no effect on the projections, with the impacts of the depreciation and appreciation movements offsetting each other.

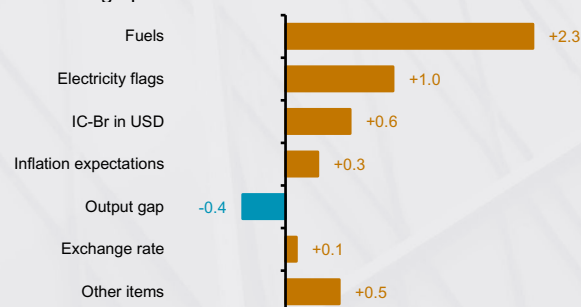
**Table 1 – Inflation projections – Scenario with Selic from Focus survey and PPP exchange rate**

Year-on-year IPCA inflation								%
Year	Qtr	Target	December 2020 IR (1)	December 2020 IR counterfactual (2)	September 2021 IR (3)	Difference (2)-(1)	Difference (3)-(2)	
2020	IV	4.00	4.3	4.3	4.5	0.0	0.2	
2021	I		4.4	6.7	6.1	2.3	-0.6	
2021	II		5.7	8.5	8.3	2.8	-0.2	
2021	III		5.0	9.2	10.2	4.2	1.0	
2021	IV	3.75	3.4	7.8	8.5	4.4	0.7	

**Figure 5 – Inflation projections**



**Figure 6 – Contributions for the difference in 2021 inflation projection between the counterfactual and the baseline scenarios of the December 2020 IR**  
Percentage points



The difference of 0.7 p.p. between the baseline scenario projections of this IR and the counterfactual scenario stems from the difference in projections of the counterfactual scenario in relation to the Extended National Consumer Price Index (IPCA) already realized during the year and from the updating in the current baseline scenario of specialists' short-term inflation projections. The latter, as already emphasized, consider a larger set of information than the model-based projections. In this aspect, we highlight the widespread surprises in industrial goods, caused, among other reasons, by the disruption in the production chain due to the pandemic, which impacted the supply of these goods. An example would be the prices of new and used cars, which rose respectively 7.77% and 8.92% between January and August 2021, so that both presented a joint contribution of 0.40 p.p. to the IPCA change in the period. In the previous ten years (2011 to 2020), these two items had an average joint annual contribution of around zero.

It should be noted that in the usual process of updating inflation projections, new information is incorporated into both the projections based on macroeconomic models and short-term expert forecasts. This exercise should be understood as an effort to understand how new economic developments have affected the inflation projections for 2021 since the December 2020 IR, from the perspective of models used by the Banco Central do Brasil (BCB). The projection of the counterfactual scenario does not necessarily correspond to

6/ Electricity and fuels are among the items with the greatest contribution to the IPCA volatility, and are channels by which inflation may be quickly and sharply impacted by volatile factors that are not so predictable in the short-term. See box "Measuring inflation risks related to energy prices", of the September 2019 IR.

the one that would be presented at the time, if the current paths of conditionals had been used, because its incorporation in the short-term forecasts comprises judgments and the incorporation of a larger set of information in comparison to that present in the macroeconomic model, parsimonious in its structure.

## Changes in the Pre-Copom Questionnaire (PCQ) Projections

The PCQ, sent to the participants of the Market Expectations System before each Copom meeting, provides additional elements to the set of information that supports the Committee's decision on the basic interest rate. In this survey conducted by the BCB, institutions present their projections on various economic indicators and analyze the conduct of monetary policy. In particular, projections are collected for the IPCA and selected components.<sup>7</sup>

The comparison of the surveys conducted between the December 2020 and September 2021 Copom meetings illustrates the growth in expectations and the role of some factors. Among these meetings, the median PCQ projections for IPCA inflation in 2021 increased by 4.9 p.p., from 3.3% to 8.3% (Table 2). Market and administered prices inflations had similar contributions to this increase, of 2.7 p.p. and 2.4 p.p., respectively. In the case of market prices, industrial goods had the most relevant contribution to the revision (1.5 p.p.), followed by food-at-home (0.7 p.p.) and services (0.4 p.p.). In administered prices, main contributions were gasoline and household electricity, 1.5 p.p. and 1.0 p.p., respectively. Finally, it can be seen that, for the IPCA and all the components mentioned, the medians of the PCQ projections of September 2021 are much higher than the percentiles 75 of the PCQ projections of December 2020.

**Table 2 – Evolution of PCQ projections for 2021 IPCA<sup>1</sup>**  
Annual inflation

	Dec 2020 PCQ			Sep 2021 PCQ			Contribution for IPCA difference (p.p.) <sup>2</sup>
	Percentil 25	Mediana	Percentil 75	Percentil 25	Mediana	Percentil 75	
IPCA	3.2	3.3	3.5	8.1	8.3	8.4	4.9
Market prices	2.8	3.0	3.2	6.4	6.6	6.7	2.7
Industrial goods	2.0	2.5	3.0	8.7	9.0	9.4	1.5
Food-at-home	3.1	4.1	5.1	8.0	8.5	9.0	0.7
Services	2.7	3.2	3.5	4.0	4.2	4.5	0.4
Administered prices	3.4	4.0	4.5	13.0	13.3	13.6	2.4
Gasoline	2.0	3.9	4.8	33.6	34.9	35.5	1.5
Electricity	-3.6	-2.3	2.2	19.4	19.7	20.3	1.0

1/ Sums and aggregate values occasionally differ due to rounding, issues related to medians and differences in IPCA weights considered by respondents for the different groups.

2/ Approximate contribution, based on January 2021 IPCA weights.

## Alternative oil price scenario from the June 2020 IR

Since the June 2020 IR, the BCB has been publishing boxes that present alternative risk scenarios as a way to highlight the uncertainties involved in inflation projections and the important role of the conditioning

7/ The set of questions in the PCQ is changed at each meeting depending on developments in the economic outlook. The PCQ has been released since May 2017 (207th meeting) and the aggregate statistics of quantitative responses started to be released from May 2021 (238th meeting).



factors used<sup>8</sup>. In particular, in the June 2020 IR, a scenario with a supply shock referring to a rise in oil prices was presented. In this scenario, the average price of oil rose by 50% over five quarters, from around USD 40 in 2020Q3 to USD 60 in 2020Q4. The maximum effect of this shock on IPCA inflation would occur between the fourth and fifth quarters after the shock, with a 0.9 p.p. increase in year-on-year inflation.

The risk illustrated in the current scenario materialized faster and more intensely than the assumption used in that alternative scenario, as the quarterly average oil price rose by about 64% over three quarters, from USD 44 in 2020Q4 to USD 73 in 2020Q3<sup>9</sup>. This movement was one of the drivers of the increase in projections for 2021 and demonstrates the importance of analyzing several alternative scenarios that explore risk factors around the baseline scenario.

## Conclusion

Since the December 2020 IR, inflation projections for the calendar year of 2021 have increased significantly. This box tries to elucidate the factors underlying the upward trajectory of projections from the point of view of the macroeconomic models used by the BCB. One may observe that the cost shocks explain an important part of the increase in the projections, mainly commodity prices, particularly fuel, coupled with the electricity tariff flag system. In addition, inflation expectations also contributed to increase projections, whereas the output gap contributed in the opposite direction and the exchange rate had a neutral effect. Broadly speaking, the results presented in this box elucidate the important role played by the conditioning factors in the projections.

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8/ See boxes “Alternative scenarios for inflation projection: impacts from demand and supply shocks” of the June 2020 IR, “Alternative scenarios for inflation projection: fiscal and extension of the pandemic effects risks” of the December 2020 IR, “Alternative scenarios for inflation projection: fiscal and further worsening of the pandemic risks” of the March 2021 IR, and “Risk scenarios for inflation projections: the US monetary policy and commodity prices”, of the June 2021 IR.

9/ Up to the cut-off date of this IR.