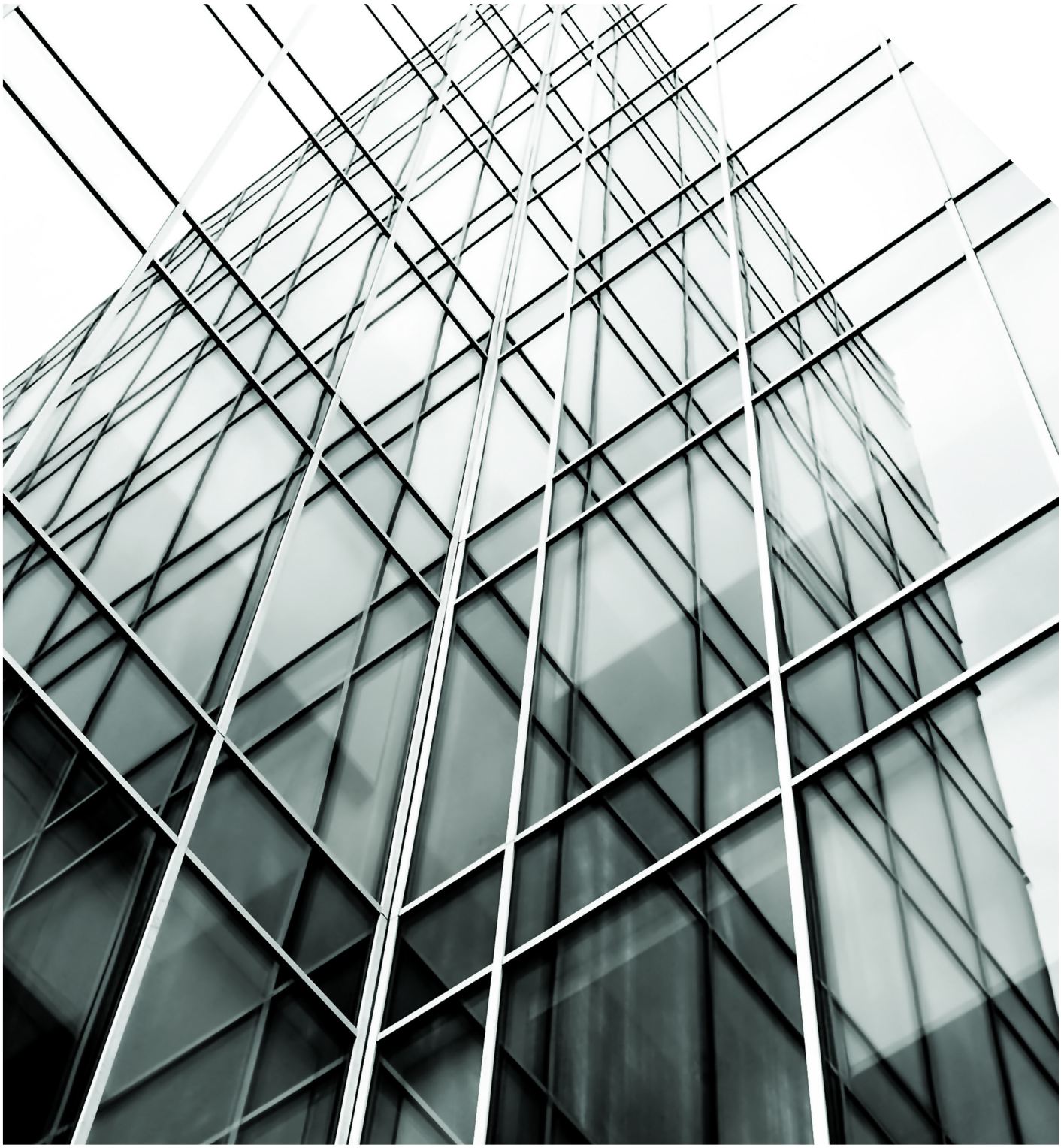


ISSN 1517-7289

Inflation Report

Volume 25 | Number 2 | June 2023

BANCO CENTRAL DO BRASIL

Inflation Report

Volume 25 | Number 2 | June 2023

ISSN 1517-7289
CNPJ 00.038.166/0001-05

Inflation Report

Quarterly publication of the Monetary Policy Committee (Copom), according to Decree 3,088, dated 6.21.1999.

The following departments are responsible for the English version of the text and the respective tables and figures:

– **Department of Economics (Depec)**
(E-mail: depec@bcb.gov.br);

– **Research Department (Depep)**
(E-mail: depep@bcb.gov.br);

– **International Affairs Department (Derin)**
(E-mail: derin@bcb.gov.br); and

– **Department of Statistics (DSTAT)**
(E-mail: dstat@bcb.gov.br).

Statistical conventions

...	data not available.
-	nil or non-existence of the event considered.
0 or **0.0**	less than half the final digit shown on the right.
*****	preliminary data.

Hiphen between years indicates the years covered, including the first and the last year.
A bar (/) between years (1970/1975) indicates the average of the years covered, including the first and the last year or even crop or agreement year, when mentioned in the text.

Occasional discrepancies between constituent figures and totals as well as percentage changes are due to rounding.

There are no references to sources in tables and figures originated in the Banco Central do Brasil.

Contact us:

Banco Central do Brasil
Institutional Relations Department – Deati
SBS – Quadra 3 – Bloco B – Edifício-Sede – 1º subsolo
70074-900 Brasília – DF
Internet: <https://www3.bcb.gov.br/faleconosco/#/contact-us>

Principles for the Conduct of Monetary Policy in Brazil

Mission and objectives

The Banco Central do Brasil (BCB) primary goal is to ensure price stability. Without compromising this goal, the BCB also aims to ensure the stability and efficiency of the financial system, smooth out economic activity fluctuations, and foster full employment. The compliance with the price stability goal is achieved by means of the inflation targeting framework, with inflation targets set by the National Monetary Council (CMN).

The experience, both domestic and international, shows that the best contribution of monetary policy to sustainable economic growth, low unemployment and improvement in people's living conditions is to keep inflation low, stable and predictable.

The economic literature indicates that high and volatile inflation rates generate distortions that lead to increased risks and negatively affect investment. These distortions shorten the planning horizons of households, companies and governments and erode business confidence. High inflation rates subtract the purchasing power of wages and transfers, with negative repercussions on household's confidence and consumption. Moreover, they produce inefficient price dispersion and reduce the informational value from prices that contributes to the efficient allocation of resources in the economy.

High and volatile inflation also has regressive distributive effects. The less favored groups of the population, which generally have more restricted access to instruments to protect them from the loss of the currency's purchasing power, benefit the most from price stability.

In short, high inflation rates reduce potential economic growth, affect job openings and income, and worsen income distribution.

Implementation

Monetary policy impacts the economy with long, variable, and uncertain lags, usually estimated to extend up to two years. As a result, there is substantial uncertainty associated with inflation projections in the relevant horizon for the conduct of monetary policy, which arises naturally from the incidence of favorable and unfavorable shocks to the economy over time. It is thus expected that, even under appropriate policy, realized inflation will fluctuate around target. The Monetary Policy Committee (Copom) should seek to conduct monetary policy so that inflation projections point to inflation converging to the target. Therefore, it is natural that monetary policy is carried out in a forward-looking way.

The inflation targeting framework in Brazil is flexible. The horizon that the BCB sees as appropriate for the return of inflation to the target depends on both the nature of the shocks that affect the economy and their persistence.

The BCB believes that a clear and transparent communication is essential for monetary policy to achieve its objectives efficiently. Thus, the BCB regularly publishes evaluations of the economic factors that determine the inflation trajectory, as well as the potential risks to this trajectory. The Copom Statements and Minutes, and the Inflation Report are key vehicles in communicating these assessments.

Inflation Report

The inflation projections are presented in scenarios that are conditional on assumptions about some economic variables. Traditionally, the assumptions refer to the paths for the exchange and Selic rates throughout the projection horizon. In addition to the baseline scenario, alternative scenarios may also be presented. It is important to stress that the scenarios presented in the Inflation Report are part of the quantitative tools used to guide Copom's monetary policy decisions and that their assumptions do not constitute and should not be seen as the Committee's forecasts for the future behavior of those variables.

The conditional inflation projections incorporate probability intervals that highlight the associated degree of uncertainty. Inflation projections depend not only on assumptions about the interest rate and the exchange rate, but also on a set of assumptions about the behavior of other variables.

Copom uses a wide range of models and scenarios, with conditioning assumptions associated with them, to guide its monetary policy decisions. By reporting some of these scenarios, the Committee seeks to enhance the transparency of monetary policy decisions, contributing to its effectiveness in controlling inflation, which is its primary objective.

Contents

Executive summary

The global environment remains challenging, albeit with some positive revisions on output growth for the year. Despite some attenuation on the stress involving banks in the US and Europe, the situation still requires monitoring. The central banks of major economies remain committed to bringing inflation back to its targets, in some cases by resuming the hiking cycles, in an environment in which inflation has been resilient. Regarding the domestic scenario, economic activity grew strongly in 2023Q1 (1.9%), far exceeding expectations. This result mainly reflected the performance of the agriculture and livestock sector. In turn, the evolution of domestic demand and of the supply components that are more sensitive to the economic cycle reinforces the assessment of economic activity slowdown.

The projection for 2023 GDP growth rose from 1.2%, in the previous Inflation Report (IR), to 2.0% in this IR, due to the positive surprise in 2023Q1. Despite this upward revision, the projection continues to reflect a prospective scenario of economic activity deceleration.

Inflation measured by the Extended National Consumer Price Index (IPCA) continued to decline since the previous IR, both in its aggregate measure and in the various underlying inflation measures. In the March-May quarter, the IPCA change was 0.23 p.p. below that of the reference scenario presented in the previous IR. The downward surprise was mainly due to the food-at-home segment and the ex-underlying component of services inflation.

The recent benign behavior of wholesale prices, both for food and industrial goods, suggests the continuation of the inflation slowdown in the coming months, considering the changes at the margin. For the second half of 2023, however, a higher twelve-month inflation is expected, as a consequence of the exclusion in this indicator of the effect of the tax measures that reduced the price level in 2022Q3 and of the maintenance of the effects of this year's tax measures.

Inflation expectations for 2023 and 2024 collected by the Focus survey have reduced and are around 5.1% and 4.0%, respectively. Some decline was also observed in longer-term inflation expectations, which are beyond the relevant horizon for monetary policy. The drop may be associated with lower uncertainties regarding the fiscal situation and the perception that a possible increase in the inflation target for the coming years has become less likely.

The projections presented use the information available up to the 255th Copom Meeting, held on June 20-21, 2023. As for the conditioning factors used in the projections, especially those from the Focus survey, the cut-off date is June 16, 2023, unless otherwise stated.

Regarding the conditional inflation projections, in the reference scenario, the interest rate path is extracted from the Focus survey, and the exchange rate starts at USD/BRL 4.85 and evolves according to the purchasing power parity (PPP). Oil prices follow approximately the futures market curve for the following six months and then start increasing 2% per year onwards. Inflation projections dropped to 5.0% for 2023 and 3.4% for 2024. In this scenario, inflation projections for administered prices are 9.0% for 2023 and 4.6% for 2024.

In its most recent meeting (255th), considering the assessed scenarios, the balance of risks, and the broad array of available information, Copom decided to maintain the Selic rate at 13.75% p.a. and judges that this decision is consistent with the strategy for inflation convergence to a level around its target throughout the relevant horizon for monetary policy, which includes the year of 2024. Without compromising its fundamental objective of ensuring price stability, this decision also implies smoothing economic fluctuations and fostering full employment.

The current context, characterized by a stage in which the disinflationary process tends to be slower and in an environment of deanchored inflation expectations continues to require caution and parsimony. Copom reaffirms its commitment to set monetary policy to meet the targets and judges that the strategy of maintaining the Selic rate for a long period has been adequate to ensure the convergence of inflation. The Committee emphasizes that it will persist until the disinflationary process consolidates and inflation expectations anchor around its targets.

The Committee judges that the current scenario demands patience and serenity in the conduct of monetary policy and reminds that the future steps of monetary policy will depend on the inflationary dynamics, especially the components that are more sensitive to monetary policy and economic activity, on inflation expectations, in particular the longer-term ones, on its inflation projections, on the output gap, and on the balance of risks.

1 Economic outlook

This chapter of the Inflation Report (IR) analyzes the recent evolution of the economic outlook, considering the international and domestic scenarios, as well as the prospects for the Brazilian economy in the coming quarters. The assessment of the international scenario addresses the main advanced and emerging economies, emphasizing aspects that tend to influence the Brazilian economy, especially inflation and activity indicators.

The analysis of the domestic outlook comprises the major drivers of economic activity, considering both the evolution of national accounts and the most frequent and timely sectoral indicators. Central aspects related to the movements in the labor market, the evolution of credit markets, and the performance of the country's public and external accounts are also assessed. The final section of this chapter analyzes the behavior of inflation and market expectations, considering the trajectories of key price indicators.

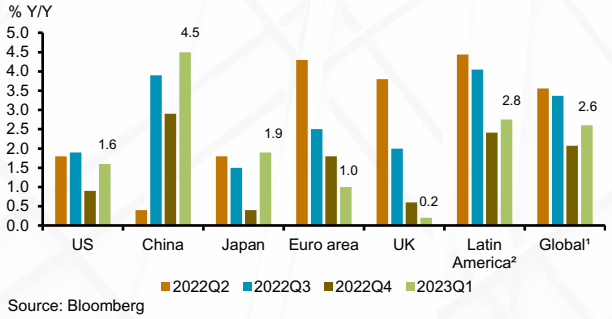
1.1 External scenario

The global scenario remains challenging, albeit with some positive growth revisions for the year. Despite some attenuation on the stress involving banks in the US and Europe, the situation keeps demanding monitoring. The central banks of major economies remain committed to bringing inflation back to its targets, in some cases by resuming the hiking cycles, in an environment in which inflation has been persistent.

Global activity has been resilient in face of the tightening of monetary policy and the recent turmoil in the international banking sector. Global growth continues below its potential, although sustained by a strong labor market and by household consumption. The dynamism of activity, especially in the services sector, associated with the dissemination of previously observed supply shocks, continues pressuring global inflation, which remains high. As the monetary policy operates with time lags on inflation, the effects resulting from interest rate increases around the world has not fully materialized yet. Conversely, new fiscal stimuli, especially in advanced economies, and climatic events that may affect the supply of commodities over the medium term, pose challenges for the convergence of inflation to its targets. In the prospective scenario, the continuity of the war in Ukraine, with its effects on the global supply of commodities, the consequences of the international banking stress on credit, the high degree of indebtedness of countries in the post-Covid, with impacts on financing conditions, foreign exchange rate and the neutral interest rate, coupled with doubts about the duration and intensity of the monetary tightening, particularly in central economies, in an environment of persistently high core inflation, are factors that keep a high degree of uncertainty on the expected trajectory for activity and global inflation.

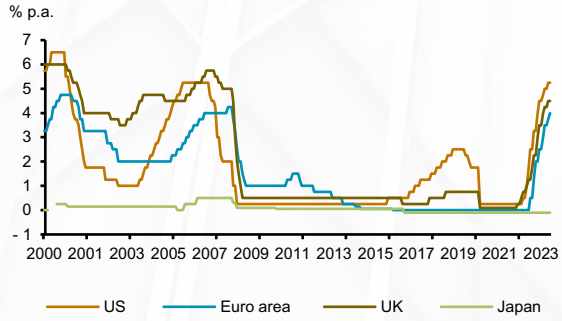
The US economy remains resilient. In 2023Q1, the US GDP rose 1.3% QoQ in annualized terms, sustained by household consumption, which has expanded in line with the pre-pandemic trend, despite the persistence mismatch between the demand for goods and services. Conversely, fixed investment has shown weakness, with uneven corporate capital expenses and difficulties of recovery of the construction sector, impacted by rising costs and interest rates in addition to low confidence levels. Depressed industrial confidence levels suggest that the low dynamics of investments should continue in the near future.

Figure 1.1.1 – GDP growth
from 2022Q2 to 2023Q1



Source: Bloomberg
1/ Calculated as described in the box "Projections and macroeconomic analysis model of the global economy" of the September 2022 IR.
2/ Argentina, Brazil, Chile, Colombia, Mexico and Peru

Figure 1.1.2 – Monetary policy rates¹



Source: Bloomberg
1/ Until June 16.

High frequency data relative to 2023Q3 suggests, so far, the continuity in US economic activity expansion, reducing the perspectives of recession in the medium term. The labor market is still strong, as shown by the high level of hirings in the year (average of 314 thousand jobs per month until May) and the unemployment rate close to historical lows, at 3.7%. Even with the increase in the participation rate, mainly in the prime age – highlighting a condition close to normality in the workforce supply – job vacancies continue at historically high levels, with a mismatch between the supply and demand of workers in all economic sectors. The conditions in the US labor market favor the pressure on wages, which have been growing at high rates in terms of historical standards – 4.3% per year in May[1] – already registering real gains at the margin.

The US banking system went through a high level of stress until early May, with the resolution of a large regional bank by the Federal Deposit Insurance Corporation (FDIC), which was later purchased by a global systemically important bank (G-SIB). The reduction of deposits in medium and small-sized commercial banks has continued, although at a moderate pace. Even though the liquidity safeguard measures announced by the Federal Reserve in March have contributed to supply liquidity to the banking system, preventing greater contagion on financial conditions, the complete removal of distrust on the banking sector has not yet materialized. These events might impact asset prices, international financial flows, the credit – which is already slowing down – and the real economy, bringing a downward risk to global activity.

US inflation remains high, at 4.0% in May[2], well above the target of 2%, but has gradually decelerated since the second half of 2022, reflecting the dissipation of shocks on energy and food. Core inflation has been resilient, at 5.3% in May, especially reflecting the dynamics of services prices. This resistance reflects the sustained demand, a still strong labor market, in addition to the inertial component itself. The prospects are that the inflation will reduce at a slow pace, converging to the target only in 2025, reflecting the cumulative effect of monetary policy actions, the economic activity deceleration, and the normalization of global supply chains.

1/ Value relative to the Average Hourly Earnings indicator.
2/ Value relative to the Consumer Price Index (CPI).

In response to this context of persistently high inflation, the Federal Reserve (Fed) has risen the Fed funds rate by 5.0 p.p. since early 2022 until May 2023. In the latest meeting, the Federal Open Market Committee (FOMC) decided to keep the Fed funds rate stable at the interval between 5.0% and 5.25%, signaling possible hikes until the end of the year. Moreover, the Fed continues to reduce the stock of government securities and mortgage-backed securities (MBS) in its balance sheet, scheduled by up to USD 95 billion per month from September 2022 onwards. The cumulative effect of already implemented actions, whose lags are not fully known, and the expected credit contraction after the episodes of stress in the banking sector from March to April, has contributed to a more cautious stance by the monetary authority in relation to the monetary tightening cycle, despite the persistence of the core inflation and the remaining pressures on the labor market.

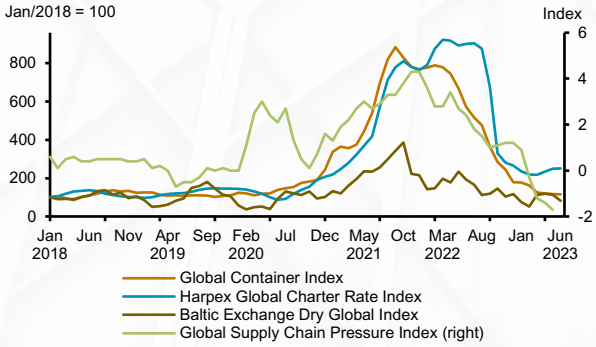
The euro area went into a technical recession in 2023Q1, influenced by rising production costs and financing and the negative performance of the German economy, which has shown less dynamism compared to the drop in domestic consumption and deceleration in the global trade of goods. Other countries in this region with greater participation in the sector of services, particularly tourism, have been resilient. Amid the resistance of underlying inflation at historically high levels, the European Central Bank (ECB) continued tightening the monetary conditions, raising interest rates by a total of 4 p.p. from July 2022 and June 2023. The headline inflation (Harmonized Consumer Price Index – HCPI) has been decelerating since November 2022, reaching 6.1% in the preliminary data for May 2023, in view of the reduction of supply pressures on food and energy. Nevertheless, the core inflation rose again in May, reaching 5.3% p.a., a level well above the target of 2%. In this environment, the ECB has reaffirmed its intention to continue increasing interest rates until the inflation scenario be compatible with its target.

In China, economic activity gained momentum after the end of social distancing measures, in December 2022, adopted throughout the Covid-19 period. GDP grew 4.5% in 2023Q1 on the YoY comparison, or 2.2% on the QoQ comparison, driven by household consumption and public investment. The 2023Q2 high frequency data set suggests some loss of the momentum recorded in 2023Q1, remaining, though, the divergence between the higher growth rate of activity in the services sector (tertiary sector) than

in the production of goods (secondary sector). In the labor market, the unemployment rate decreased in April, following the seasonal pattern, reaching a level close to that of the pre-pandemic period. Nevertheless, the unemployment rate for the young population remains high, signaling a less dynamic job market.

Inflation in China depicts the challenges for the country's economic recovery. Consumer inflation remains at historically lows, standing at 0.2% p.a. in May. Industrial producer prices registered further reduction in May, deepening the 12-month price decline, which has affected sales and operating income of the industry, with the consequent reduction of profitability. In a context of slowdown in global trade and lack of robustness in the recovery of several sectors of the economy, the People's Bank of China (PBC) decided in June to reduce the interest rate by 0.10 p.p. The exchange rate registered some depreciation in the year, which may benefit the recovery of exports, conditional on the improvement of the external demand.

Figure 1.1.3 – Maritime freight indicators (2018-2023)[1]

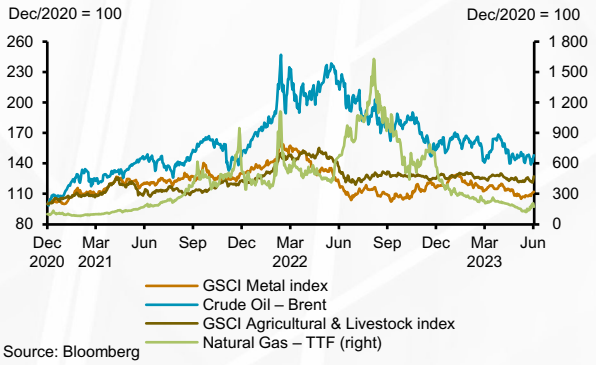


Sources: Refinitiv, Federal Reserve (Fed)
1/ Monthly averages - Until June 16.

Emerging economies have, in general, also shown economic growth resilience, despite the challenges of the global scenario. For 2023, the trend in most countries continues to be of lower growth rates, reflecting the global slowdown and adjustments in monetary policies. Throughout 2023Q2, the trajectories of exchange rates in emerging economies diverged, reflecting more strongly local factors amid improved risk appetite and expectations of the end of the cycle of monetary tightening in the US.

With regard to global supply pressure factors, indicators that measure pressures on global supply chains returned to their historical averages despite the persistence of risks related to the consequences of the Russia-Ukraine war on raw materials supplies and evolving geopolitical tensions.

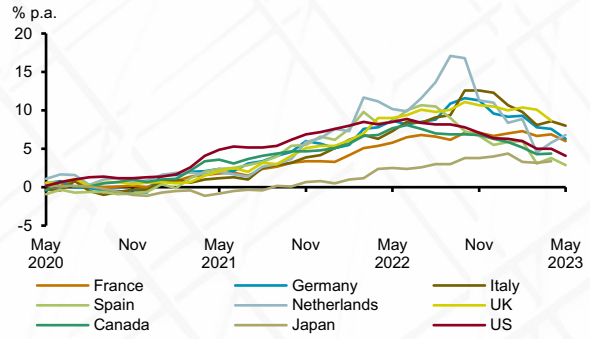
Figure 1.1.4 – Commodity prices[1]



Source: Bloomberg
1/ Until June 16.

Commodity prices continue to be influenced by the prospects of global growth, particularly of the Chinese economy, as well as by developments related to the war in Ukraine. The price of energy commodities fell in the period, with a relevant impact on global consumer inflation. In the case of oil, on the demand side, Chinese consumption has shown a slower recovery than initially expected. Concerns on the supply side have focused on the OPEC+ voluntary cuts set in April and Saudi Arabia's in June, since the impact of the European embargo

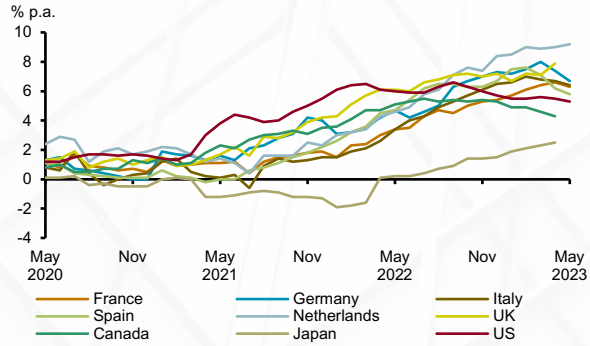
Figure 1.1.5 – CPI – Advanced economies[1]



Source: Bloomberg

Until May/2023.

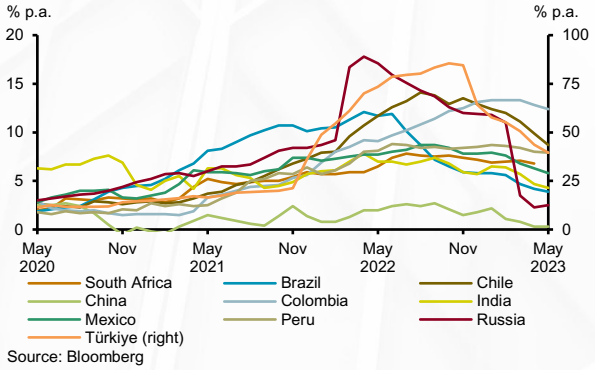
Figure 1.1.6 – CPI core – Advanced economies[1]



Source: Bloomberg

Until May/2023.

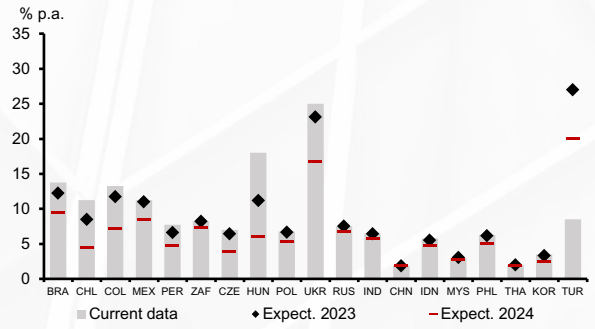
Figure 1.1.7 – CPI – emerging markets



Source: Bloomberg

Until May/2023.

Figure 1.1.8 – Policy interest rates[1]



Sources: Bloomberg and central banks' surveys

1/ Until June 19.

on Russian crude oil was reduced in view of the reorganization of supplier markets, the maintenance of Russian production, and the redirection of its exports to other countries. Nevertheless, the persistence of uncertainty about the prospective global scenario continues to affect the outlook for oil demand and prices.

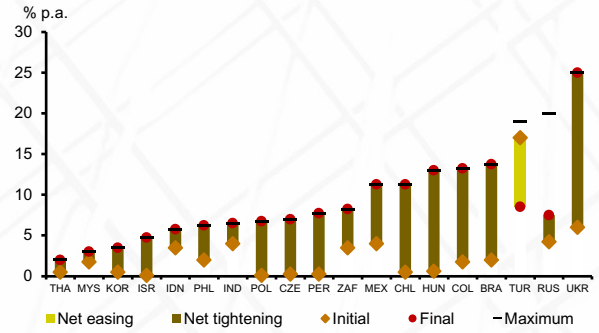
Natural gas, a critical input for energy generation in much of the world, maintained its downward momentum, reflecting higher-than-expected stock levels due to the milder winter in the northern hemisphere, lower demand for LNG imports in China, and energy-saving measures by European consumers and the expansion of liquefied gas supply in Europe. Despite the generally favorable dynamics, risks remain due to climate change, unexpected halts in the production and distribution of natural gas, and the possibility of increased consumption in Europe and Asia in an environment of low prices when compared with the previous year.

Metal commodities, fueled in 2022Q4 by the announcement of stimulus measures in China to contain the slowdown in the real estate sector and later by the reopening of the economy, declined amid doubts about the pace of recovery of the Chinese economy and uncertainties regarding the global growth outlook.

Agricultural commodities, meanwhile, initially reacted negatively amid improved supply forecasts with the end of *La Niña* and the continuation of the Black Sea grain export corridor until mid-July. However, prices have been pressured again since early June, amid uncertainties about the extension of the agreement on exports through the Black Sea, concerns about further outbreaks of avian influenza and, especially, the increased likelihood of the arrival of *El Niño*. This climatic phenomenon can affect the global supply of grains, such as wheat, corn, rice, soybeans, coffee, sugar, among others, especially in some regions of Asia and Australia, but also posing risks to areas in Africa and the Americas.

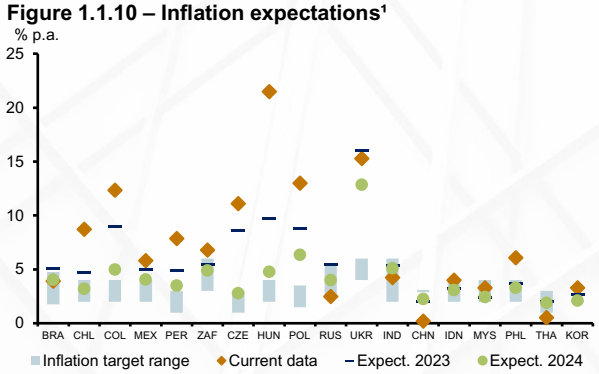
Despite the moderation in commodity prices, the dissemination of inflationary pressures to more inertial items should contribute to maintain global inflation high in the short and medium terms. The persistence of inflationary pressures remains a risk to the prospective scenario of monetary policy in advanced and emerging economies.

Figure 1.1.9 – Change in interest rates since Feb/21[1]



Sources: Bloomberg and central banks' surveys
1/ Until June 19.

Figure 1.1.10 – Inflation expectations[1]



Sources: Bloomberg and central banks' surveys
1/ Until June 19.

In emerging economies, inflation rates remain above the target in many countries, although in some cases the indices are already on a convergence process, especially in Asia. In other countries, greater resistance in the inflationary process still persists. Expectations drawn from analysts' surveys predominantly foresee decelerating inflation rates throughout 2023, but with a temporary recovery in the pace of price increases in some economies over the next quarters. With the exception of Asian countries, the prevailing scenario for the end of 2023 is of inflation rates above center of the target range. Amid declining inflation rates, most central banks in emerging economies have interrupted their monetary tightening cycle. Surveys with market analysts point to the possibility of cuts in the interest rates later this year, especially in Latin America.

In summary, growth prospects for the global economy remain surrounded by a high degree of uncertainty. The realignment of relative prices, the normalization of activity in the services sector, tight labor markets, and still robust demand for goods suggest that inflation rates, especially core indexes, should remain persistently high for a longer period than recently observed, requiring interest rates at contractionary levels for an longer period. The persistence of inflation has even led the Canadian and Australian central banks to raise interest rates after a period of interest rate stability. Despite the recent slowdown, concerns related to the banking system in the US and Europe persist, particularly those related to the impacts on credit to the real sector of the economy. With inflation still high, the increased uncertainty about the financial system makes the conduct of monetary policy even more challenging.

1.2 Domestic outlook

Economic activity

The Brazilian economy grew 1.9% in 2023Q1 after dropping 0.1% in the previous quarter. The increase far exceeded what was expected at the time of the March 2023 IR.[3] Despite the positive surprise, the Quarterly National Accounts breakdowns show a slowdown in both domestic demand components and in the more cyclical supply components.

From the supply side, confirming the BCB's expectations presented in the March 2023 IR[4], the GDP growth in 2023Q1 mostly reflected the strong expansion of agriculture and livestock, which increased 21.6% driven by the record harvest of soybeans, a crop with a high sectoral share whose harvest is significantly concentrated in 2023Q1. The Gross Value Added (GVA) excluding agriculture and livestock grew 0.1%, with a 0.1% decrease in industry and a 0.6% increase in the services sector. Assuming that the strong growth in agriculture and livestock has had positive spillovers on the other sectors of the economy[5], the drop in the secondary sector and the relatively modest growth in the tertiary sector reinforce the evaluation of economic activity slowdown.

In the industrial sector, manufacturing and construction – the components most sensitive to the economic cycle – registered another quarterly decline.[6] In the opposite direction, mining grew for the fourth consecutive quarter and the utilities sector expanded driven by the reduction of the share of thermal power plants in the total production of electricity.[7]

The segments of the services sector registered moderate changes in general. The exceptions were "transportation, storage, and mail" – possibly influenced by the soybean harvest transportation – and "financial, insurance, and related services". Despite the positive contribution of the high growth in agriculture and livestock to the trading

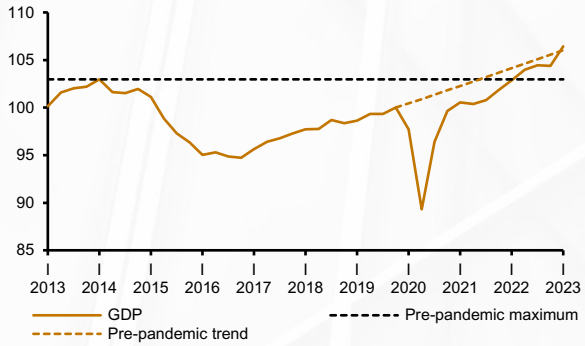
Table 1.2.1 – Gross Domestic Product
Quarter/previous quarter
Seasonally adjusted

% change

Itemization	2021				2022
	I	II	III	IV	I
GDP at market prices	1.0	1.1	0.5	-0.1	1.9
Agric. and livestock	-0.1	-0.5	-1.1	-0.9	21.6
Industry	0.8	1.6	0.6	-0.3	-0.1
Mining	-3.6	2.4	0.5	2.2	2.3
Manufacturing	1.2	1.8	-0.4	-1.5	-0.6
Construction	2.2	1.4	0.9	-0.6	-0.8
Public utilities	6.5	1.6	1.0	1.8	1.7
Services	1.0	1.2	0.9	0.2	0.6
Trade	1.0	1.8	0.3	-0.8	0.3
Transportation and storage	1.8	2.4	0.9	0.3	1.2
Information services	-3.0	3.6	3.5	0.9	-1.4
Financial and related services	-1.0	-0.2	2.3	1.2	1.2
Other services	3.6	2.8	1.3	0.5	-0.5
Real estate	0.1	0.8	1.4	0.5	0.3
Public admin., health and education	0.4	-1.1	1.1	-0.3	0.5
Household consumption	1.2	1.9	0.8	0.4	0.2
Government consumption	-0.4	-0.7	1.3	0.3	0.3
Gross fixed capital formation	-1.3	3.5	2.3	-1.3	-3.4
Exports	8.0	-2.4	4.2	3.3	-0.4
Imports	-1.6	6.7	4.7	-3.1	-7.1

Source: IBGE

Figure 1.2.1 – Gross Domestic Product
2019 = 100, s.a.

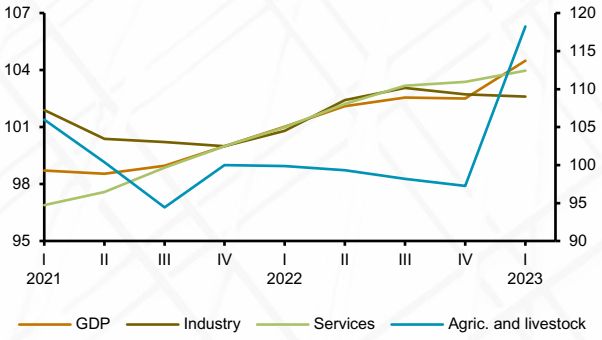


Source: IBGE

3/ The YoY GDP change in 2023Q1 was 4.0%. In the cut-off date of the March 2023 IR, the median market forecasts, according to the Focus Report, was 2.0% (considering forecasts informed in the previous 5 business days).
4/ See box "Revision of the 2023 GDP projection", of the March 2023 IR.
5/ See box "Impact of the crop harvest on the economic activity", of the June 2017 IR.
6/ This was the third consecutive decline in manufacturing and the second in construction.
7/ The share of thermal power plants in total energy produced in 2023Q1 was the lowest for the period since 2011. Since thermal power plants use more inputs for energy production than hydroelectric, wind, and photovoltaic power plants, their lower share results in an increase in GVA per amount of energy produced.

Figure 1.2.2 – Gross Domestic Product – Supply

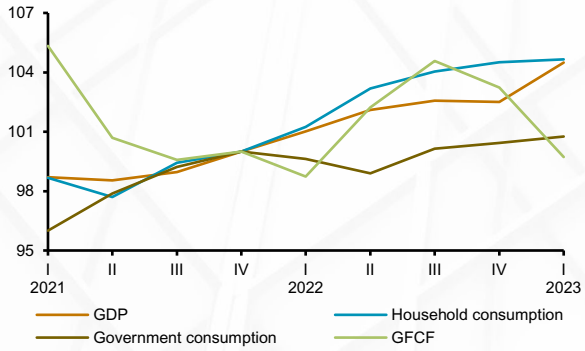
2021 = 100, s.a.



Source: IBGE

Figure 1.2.3 – Gross Domestic Product – Demand

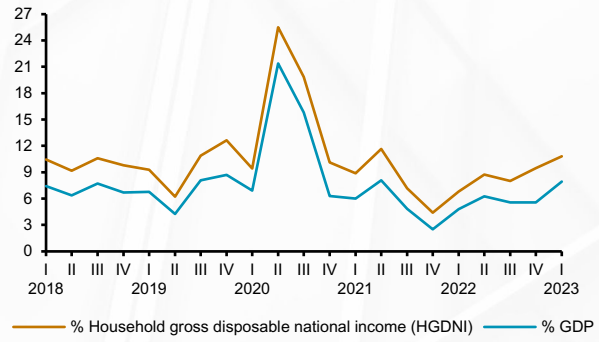
2021Q4 = 100, s.a.



Source: IBGE

Figure 1.2.4 – Households' savings rate

%, s.a.



Sources: BCB and IBGE

margins, the expansion of the "trade" segment was modest, affected by the deceleration in household consumption and the fall in manufacturing. The decline in 2023Q1 of the "other services" segment – which includes activities such as lodging, food-outside-home, and leisure – indicates the decreased impetus of households in the consumption of services.

From the point of view of final demand, government consumption grew 0.3%, while household consumption rose 0.2% – the lowest rate in the last seven quarters. Household consumption expansion lower than that of disposable income (1.9%, in the restrict Household Gross Disposable National Income – HGDNI concept) suggests an increase in the savings rate in the quarter[8], a movement possibly associated with the rise in interest rates and households deleverage efforts. In this context, net flow of funds from the financial sector to households declined, returning to the negative field.[9]

The Gross Fixed Capital Formation (GFCF) continued to decline, accumulating a 4.6% drop in the last two quarters. This movement reflects the contraction of both construction and absorption of capital goods. BCB estimates based on disaggregated data on production, imports, and exports suggest that the decline in the absorption of capital goods in 2023Q1 was relatively widespread across product categories, with trucks and buses standing out.[10, 11] In the opposite direction, the largest contribution came from the increase in agricultural capital goods.

In the external sector, exports remained close to stability in relation to 2022Q4, while imports dropped sharply for the second consecutive quarter, reflecting, in particular, falls in imports of intermediate goods and, in 2023Q1, also of capital goods.

Monthly data for April and coincident indicators for May suggest, in general, the continuity of the economic activity slowdown in 2023Q2.

Industrial output fell by 0.6% in April, with declines in the manufacturing and extractive industries,

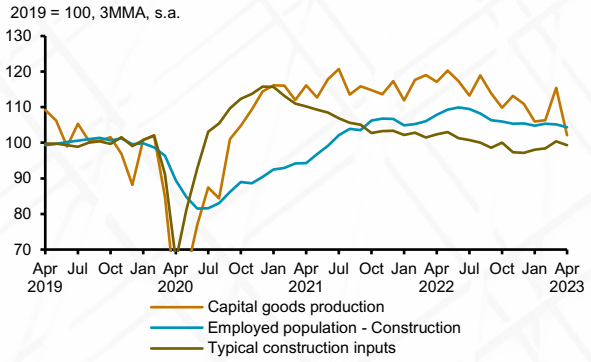
8/ Household savings was computed using the BCB's HGDNI estimate – for more details, see box "Monthly estimate of the Household Gross Disposable National Income", of the December 2021 IR – and the household consumption from the Quarterly National Accounts.

9/ Regarding the increase of the disposable income, see section "Labor Market" in Chapter 1 of this IR. Regarding the reduction of the financial flow, see section "Credit" .

10/ A significant decrease in the production of trucks and buses in 2023Q1 was expected due to changes in the rules for the emission of pollutants in 2023, according to the schedule of the Air Pollution Control Program for Motor Vehicles (Proconve), which led to the anticipation of part of the production to 2022.

11/ For methodological details, see box "Recent Evolution of Gross Fixed Capital Formation" of the March 2022 IR.

Figure 1.2.5 – Investment indicators



Sources: IBGE

Table 1.2.2 – Apparent demand for capital goods

Selected components

2023Q1 over 2022Q4, s.a.

%

Itemization	Variation	Contribution
Capital goods	-5.7	-5.7
Industry	-0.5	-0.1
Electricity power	-20.7	-1.0
Agriculture	11.4	1.1
Construction and mining	-9.5	-0.7
Light vehicles	-1.1	-0.1
Trucks and buses	-28.0	-4.5
Others transportation equip.	11.6	0.2
Computer equip., electronic, measuring ...		
... and optical products	-4.1	-0.8
Others	3.4	0.2

leaving no statistical carry-over for 2023Q2. In the breakdown by category of use, notable declines were seen in the production of capital goods and durable consumer goods, largely reflecting a reduction in the production of vehicles. The volume of services also declined in April, -1.6%, leaving a negative statistical carry-over of -0.5% for 2023Q2. The segment of services rendered to households resumed growth, partially reverting the declines occurred in the previous three months. As for the trade of goods, the volume of retail sales in the restricted concept remained practically stable, while, in the broad concept, excluding the "specialized wholesale of food products, beverages, and tobacco"[12], it declined 0.4%. With these results, the statistical carry-over for 2023Q2 in both retail sales concepts stood at 0.6% and 0.2%, respectively.

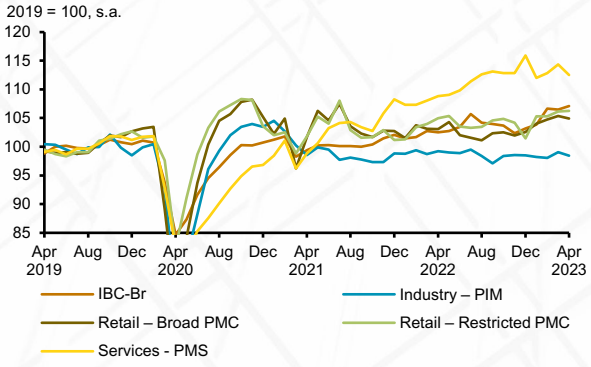
Although economic outlook indicators have shown predominantly negative or close to stability results in April, the BCB Economic Activity Index (IBC-Br) grew 0.6%, after a slight retreat in the previous month, leaving a 1.3% statistical carry-over for 2023Q2. However, this statistical carry-over should be put into perspective. It is worth noting that revisions to the Brazilian Institute of Geography and Statistics (IBGE)'s economic surveys[13] and the uncertainties inherent to the seasonal adjustment process, possibly amplified by the aforementioned revisions, increase the difficulty in interpreting the QoQ variations. Additionally, early estimates suggest that the agriculture and livestock activity will be a relevant decreasing factor for the May IBC-Br decline since most of the harvest of soybeans occurs until April.

The coincident economic activity indicators for May suggest stability or decline in the month. Retail sales indicators constructed using data from card

12/ The analysis of the series with the exclusion of the specialized wholesale of food products, beverages, and tobacco was carried out to preserve the consistency of historical data and reduce potential distortions in 2023 data. The recent inclusion (as of January 2023) of this segment with a relevant weight (15.9% of revenues) and with a great difference in the seasonal pattern in comparison with the other broad retail segments (with a high volume in March) may distort the seasonally adjusted series of the volume of broad retail sales.

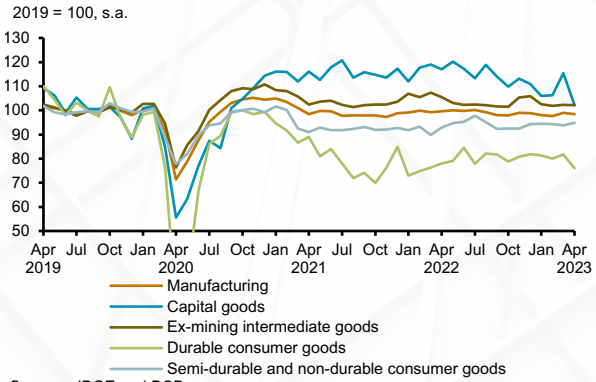
13/ Three of the IBGE's main economic surveys – Monthly Industrial Survey (PIM), Monthly Survey of Trade (PMC), and the Monthly Survey of Services (PMS) – were subject of revision in the January 2023 release. These updates are essential to maintain the quality and relevance of data produced, and involve adjustments to the samples, in the weighting structures, and in the calculation of the reference year, in addition to expanding the number of available time series. New survey's time series have 2022 as base year and use as reference the monthly average of the total Gross Revenue for 2022 for both the PMS and PMC. In the case of PIM, the reference is the production structure of the 2019 Annual Industrial Surveys (PIA). It should be emphasized that the introduction of the new series causes a break with the previous series. Although IBGE makes a chaining process to minimize the problems arising from this rupture, there may still be uncertainties regarding the seasonal pattern of the new series. This may result in more abrupt changes in the releases, especially in the seasonally adjusted series and during the first year of release. In general, these updates aim to ensure the accuracy and timeliness of information provided by the surveys, allowing a thorough and reliable analysis of the economic outlook.

Figure 1.2.6 – Economic activity indicators



Sources: IBGE and BCB

Figure 1.2.7 – Industrial production



Sources: IBGE and BCB

Table 1.2.3 – Economic activity coincident indicators

Seasonally adjusted

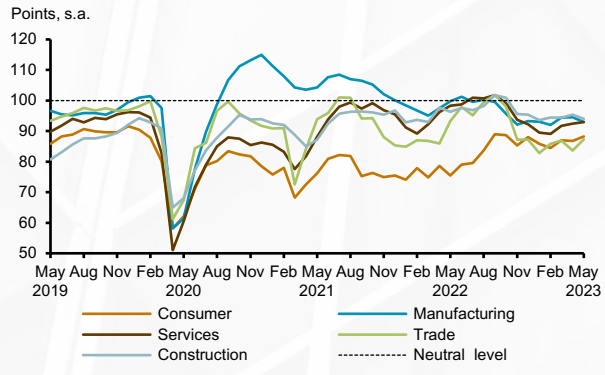
% change

Itemization	2023					
	Jan	Feb	Mar	Apr	May	Q2[1]
Circulation of heavy vehicles	1.1	-1.2	3.4	-2.4	1.9	0.3
Corr. cardboard shipment	3.8	-0.1	1.4	2.7	-0.6	3.3
Vehicles production	-7.3	1.4	2.4	-1.6	11.0	6.0
Trucks production	-59.0	44.8	27.3	-33.0	2.1	-12.8
Vehicles sales	-6.0	-7.5	15.3	-5.5	-4.7	-1.3
NUCI (%)	78.8	78.7	79.0	80.7	80.1	2.0

Sources: ABCR, ABPO/Empapel, Anfavea, and Fenabrave

[1] Average Apr-May 2023/Average Jan-Mar 2023.

Figure 1.2.8 – Confidence index



Source: FGV

transactions[14] in general show slowdown in retail trade and in services rendered to households. Among the coincident indicators of industrial production, the declines in the shipment of corrugated paper (ABPO/Empapel) and in the use of installed capacity (Nuci) in the manufacturing industry stands out. In the automotive segment, sales dropped while production expanded, movements influenced by the expectation that a government incentive program for the automotive industry would come into effect, with sponsored discounts on the purchases of trucks, buses, and lower value light vehicles. The announcement may have reduced sales in the last days of May, since some consumers would have opted to wait for more favorable purchase conditions. The high production of vehicles, according to an Anfavea's statement, reflected the resumption of the operation of factories that were halted in April and the expectation of higher demand in the coming months due to government incentives. Due to the mismatch between production and sales, vehicle inventories registered an atypical increase in the month.

Consumer and business confidence indexes, except for those of construction, grew between February (latest data available in the 2023 March IR) and May. However, they remain below the neutral level and, except for the confidence levels of consumers and businessmen in the construction sector, the pre-pandemic levels.

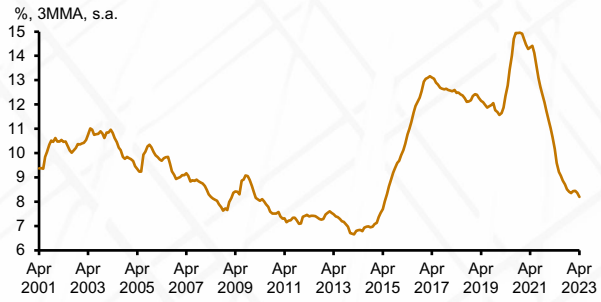
As detailed in a box of this IR, the 2023 GDP growth projection rose from 1.2% to 2.0% due to the positive surprise in 2023Q1. Despite the expectation of a higher increase in 2023, the projection continues to reflect the prospective scenario of economic activity slowdown in 2023 with modest variations in the industry, services, and domestic demand throughout the year.

Labor market

The labor market has shown heterogeneous signs in the last months, after decelerating throughout the second half of 2022. On the one hand, the unemployment rate continued to decline and the generation of formal jobs increased. On the other hand, the employment level, and the participation rate continued to decrease.

14/ Assessed indicators include IDAT (Banco Itaú), IGet (Santander/Getnet), ICVA (Cielo), and the Stone-Varejo (Stone).

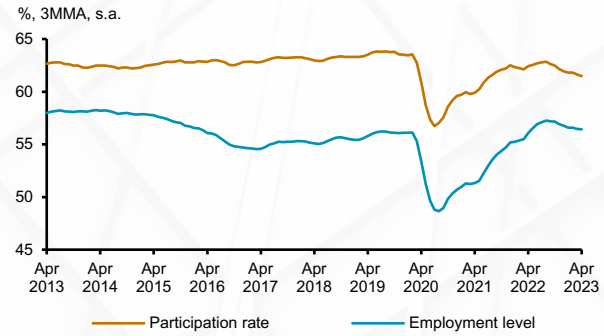
Figure 1.2.9 – Unemployment rate[1]



[1] Historical unemployment rate estimates following Alves, S. A. L. and Fasolo, A. M., "Not Just Another Mixed Frequency Paper", Banco Central do Brasil (2015), Working Paper 400.

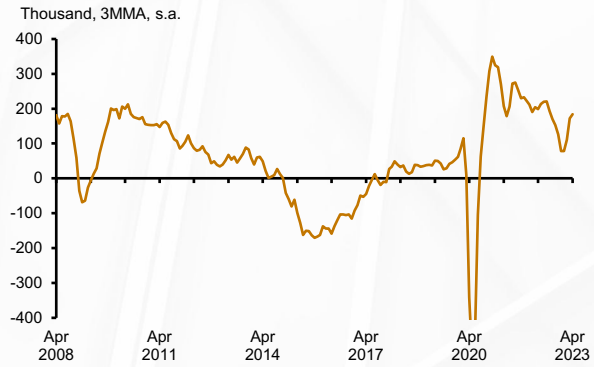
Sources: IBGE and BCB

Figure 1.2.10 – Participation rate and employment level



Source: IBGE

Figure 1.2.11 – Net formal job creation



Source: Ministry of Labor and Employment

Unemployment fell in the Feb-Apr quarter both in its traditional measure and in broader measures, which encompass workforce under-utilization.[15] The traditional unemployment rate is at its lowest level since 2015, according to seasonally adjusted data from the Continuous National Household Sample Survey (PNAD Continuous). However, the decrease in unemployment largely reflected the contraction of the workforce. The participation rate has persisted on the downward trajectory that started in the second half of last year, reaching a level considerably lower than before the pandemic. The employment level – the ratio of the employed population to the working-age population – also continued to decline, reaching a level closer to the 2012-2019 average and to the level observed just before the pandemic.

The New General Registry of Employed and Unemployed Persons (New Caged) continued to register high formal job creation in the last months, after slowing down in late 2022. Some recovery of the formal employment was also observed in the corresponding seasonally adjusted series of the PNAD Continuous. The New Caged's positive results reflected a strong resumption in hirings and were widespread across economic activities. The behavior of hirings and layoffs in the period, consistent with a more dynamic labor market, came as a surprise, considering the moderate performance of activity in the more cyclical sectors of the economy.

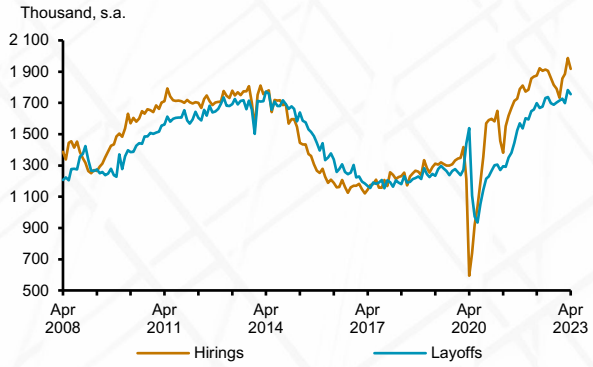
The evolution of the real labor income in early 2023 was not as positive as in the second half of 2022, despite the increase in the minimum wage and the continued beneficial influence of inflation reduction. On the one hand, the income actually received, as measured by the PNAD Continuous, grew by 1.1% in 2023Q1, standing 0.9% above the average level for 2019. On the other hand, the labor income usually received, as measured by the same survey, declined 0.5% in the Feb-Apr quarter and stands at a level 0.7% below the average value for 2019.

Data from collective bargaining agreements (CBA)[16], which cover the formal private market, are used to complement the wage level evaluation. Declining nominal wage adjustments are observed, in line

15/ Workforce under-utilization measures calculated by the IBGE, detailed in a September 2016 technical note (PNAD Continuous - Technical Note 02/2016), and by the BCB, according to box Workforce under-utilization indicators adjusted by hours worked, of the December 2019 IR.

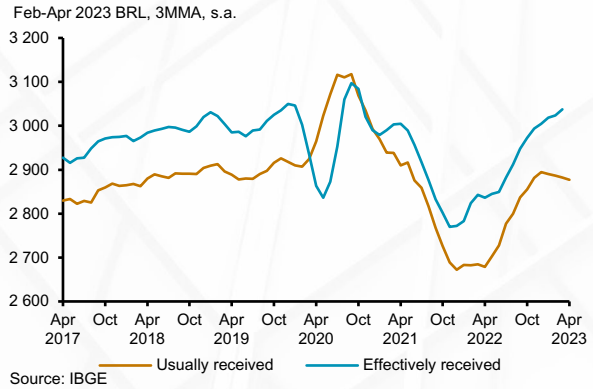
16/ This refers to the arithmetic average of nominal adjustments of the collective bargaining agreements in São Paulo and Rio de Janeiro by registration date criterion in the Collective Labor Negotiations System (Mediador) of the Ministry of Labor and Employment (MLE). The agreements considered are those for which it was possible to adequately capture the percentage of adjustment agreed upon.

Figure 1.2.12 – Hirings and layoffs



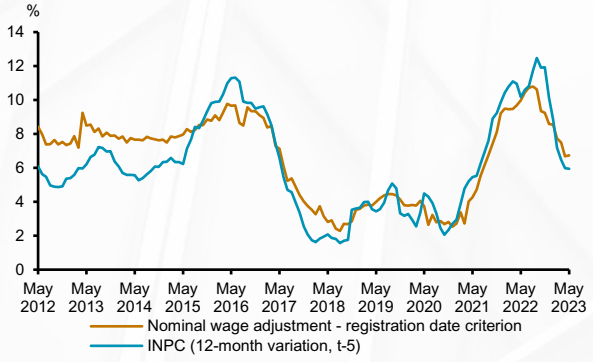
Source: Ministry of Labor and Employment

Figure 1.2.13 – Real average labor income



Source: IBGE

Figure 1.2.14 – Collective bargaining agreements



Sources: IBGE, Ministry of Labor and Employment, BCB

with the recent disinflation movement. Even with the decline in nominal adjustments, the last four months show, for the first time since 2020, wage gains in real terms.[17]

In the early months of the year, the overall real labor income, resulting from the combination of average earnings and the employed paid population, remained stable in the usual income concept and grew in the actual income concept. Regardless of this discrepancy, both indicators showed deceleration against 2022.

The restricted HGDNI[18], an indicator that incorporates other sources of household income besides labor, here measured by the average income effectively received, increased in the Feb-Apr quarter compared with 2022Q4, in the seasonally adjusted series[19]. In the quarter, the HGDNI was driven, in addition to the expansion of the labor income, by the increase in social security benefits, heavily affected by the adjustment of the minimum wage. Conversely, the increase in transfers paid by households, especially taxes on income and wealth, contributed to reduce disposable income.

Prospectively, despite a certain resilience shown in the early months of 2023, the prospect of economic activity deceleration throughout the year tends to have repercussions, albeit with a lag, on labor market conditions.

Credit

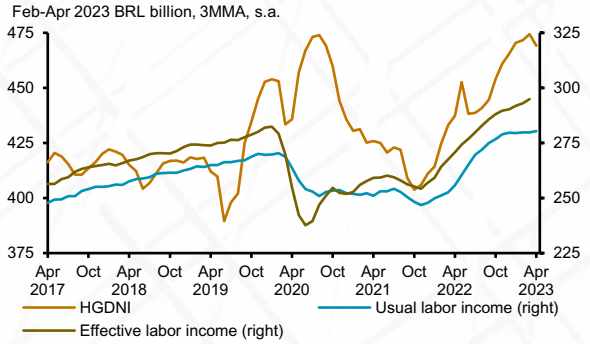
The loss of momentum observed in the credit market since mid-2022, especially in the non-earmarked segment, continued in early 2023. This movement is consistent with the current stages of economic activity and monetary policy cycles, but also reflects events that increased risk aversion. Delinquency increase was widespread in the period, although at a moderate pace, and interest rates on non-earmarked credit rose in the household segment and remained relatively stable in the corporate segment.

17/ Usually, there is a lag between the negotiation and the registration in the system. Exercises suggest that, based on the date of registration, the agreed adjustments have a higher correlation with the 12-month National Consumer Price Index (INPC) measured five months earlier, the deflator used in this analysis. If the effective date is considered, the highest correlation is with the INPC of the previous month. However, the effective date criterion has the disadvantage of low representativeness in recent months.

18/ Further details on the BCB's HGDNI in the box Monthly estimate of the Household Gross Disposable National Income of the December 2021 IR.

19/ There is a relevant uncertainty in the HGDNI seasonal adjustment process, hampered by changes in the payment schedules of income transfers and by the release of extraordinary funds in recent years.

Figure 1.2.15 – Restricted household gross disposable national income and overall labor income



Sources: IBGE and BCB

Figure 1.2.16 – New non-earmarked credit operations

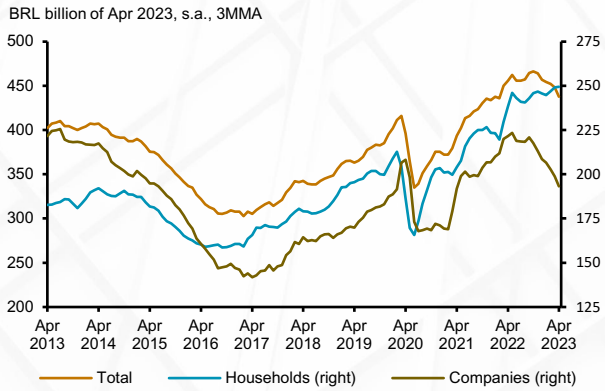
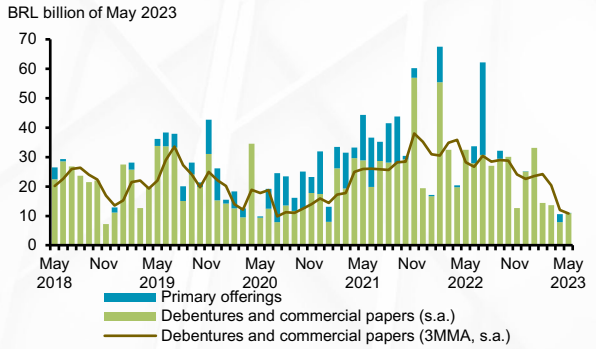
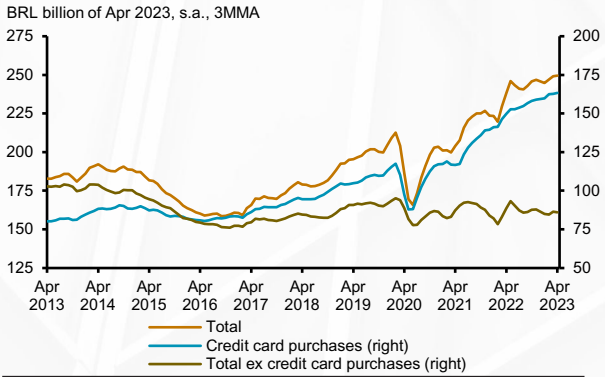


Figure 1.2.17 – Non-banking corporate financing



Source: BCB and Anbima

Figure 1.2.18 – Non-earmarked household granting



Non-earmarked credit granting in the National Financial System (SFN) fell by 3.7% in the Feb-Apr quarter, considering seasonally adjusted data deflated by the IPCA. This movement was driven by the corporate segment, which dropped 6.5%, after a sharp decline in the previous quarter (-5.1%) as well. This reduction, which began in 2022, is broadly consistent with the economic activity slowdown and with the typical effects of the current monetary policy cycle[20], although some impact of the *Americanas*[21] case is also observed in some modalities. The operations that registered the largest declines in the quarter were discount of receivables, discount of credit card invoices, and working capital.

The impact of recent events in some large companies, with requests for judicial reorganization, was more relevant in the domestic capital market. The declining trend in the issuance of fixed income securities by companies, which began in 2022, worsened in the Feb-Apr quarter. Furthermore, there were increases in risk premia and in the chunck of issuances target to intermediaries and other participants in the offering.[22] However, after a six-month halt, primary issuances resumed in April, while, in May, fixed income issuances rose moderately.

In the Feb-Apr quarter, the volume of non-earmarked corporate credit granting increased slightly, driven by credit card purchases. In the same period, low cost credit granting[23], which does not include emergency modalities such as overdraft facility and revolving credit card, fell by 10.2%. Payroll-deducted credit operations, in particular, decreased by 19.8%, with a relevant impact from the interruption in the supply of this modality to INSS beneficiaries in the last fortnight of March, and only a partial recovery in April. A more recent phenomenon in the household segment that became more evident in the Feb-Apr quarter is the reduction also observed in the high cost credit modalities[24].

Earmarked household credit operations declined 4.6% in the Feb-Apr quarter. The sharpest decline was observed in real estate financing, which is on a downward trend since the second half of 2021, in line with the increased interest rate of this modality. Rural credit granting also declined, but remained

20/ See box "Cycles of credit granting with non-earmarked resources and of economic activity" of this IR.

21/ *Americanas* is a large Brazilian retail company that filed for judicial reorganization in January 19, 2023.

22/ A more detailed discussion is available in the Section "1.2.2 Credit" of the Financial Stability Report of May 2023 (Portuguese only).

23/ Low cost modalities: payroll-deducted credit, vehicles financing, leasing, and discount of checks.

24/ High cost modalities: overdraft facility, non-payroll-deducted personal credit, other goods financing, revolving credit card, installment credit card, and other non-earmarked credit.

Figure 1.2.19 – Non-earmarked household granting

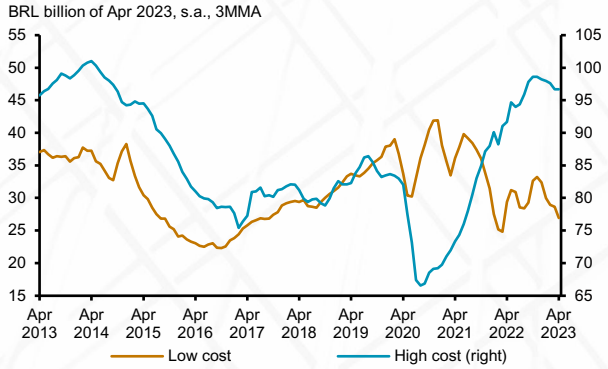


Figure 1.2.20 – New earmarked credit operations

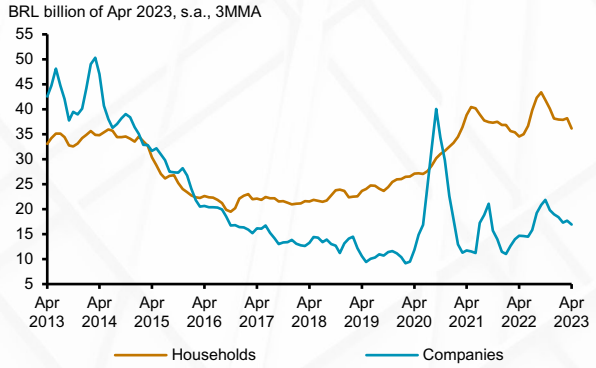
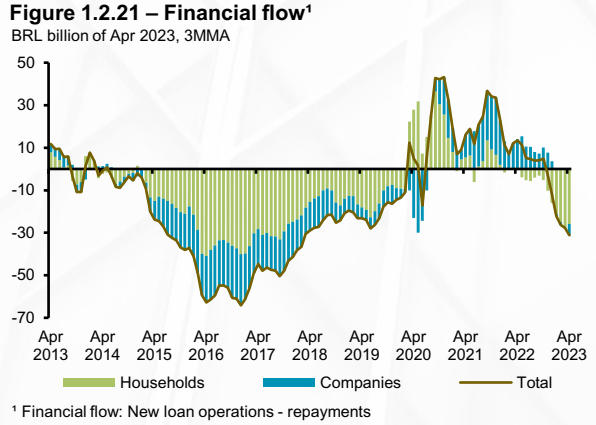
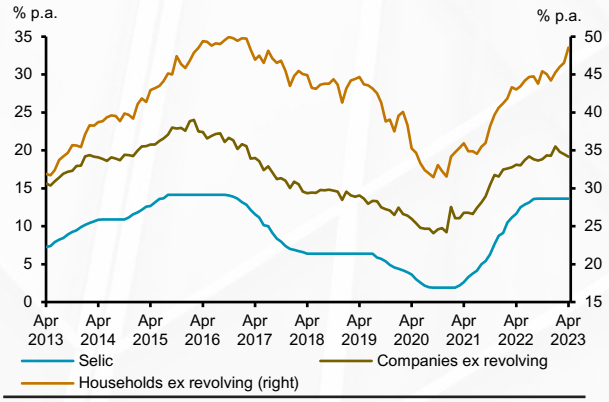


Figure 1.2.21 – Financial flow[1]



[1] Financial flow: New loan operations - repayments

Figure 1.2.22 – Non-earmarked interest rates



at a higher level than in the same period of 2022. Despite the fact that loans granted within the scope of Pronampe[25] and PEAC-FGI[26] are still at a high level, earmarked corporate credit decreased in the period with the slowdown of BNDES financing.

Reduced credit granting added to increased amortizations implied a slower pace of growth in the SFN credit portfolio and an expansion in the net flow to the financial sector in the amount of BRL 26.8 billion.[27] In the case of companies, there was a significant increase in the net flow, which is negative[28] since 2022. In the case of households, the net flow has become negative over the last months, with a notable movement in non-earmarked credit operations. This movement might be an explanatory factor for the slowdown of household consumption, consistent with the monetary policy cycle.

Interest rates on non-earmarked credit operations continued to increase in the Feb-Apr quarter, driven by the increased cost of household credit. In household operations, the recent increase occurred especially in high cost modalities with greater delinquency, such as non-payroll-deducted personal credit and revolving and installment credit card. Interest rates of lower risk modalities, such as vehicles financing and payroll-deducted credit, in turn, remained relatively stable. Some stability was also observed in the interest rates of non-earmarked corporate operations. On a broader perspective, interest rates on non-earmarked credit excluding revolving modalities remain at levels similar to those observed during the monetary tightening cycle of 2015 and 2016.

Household indebtedness dropped again in early 2023, after reaching the highest value of the time series in July 2022. This decline reflected both the expansion of income and the moderation in the credit balance growth. Household debt-service ratio, however, remains relatively stable at a high level, given the higher cost of credit.

The delinquency rate in the SFN rose 0.3 p.p. in the Feb-Apr quarter to 3.5%, the highest rate since November 2017. As for non-earmarked corporate operations, the delinquency rate is at a level similar to that of 2019. Throughout 2022, the delinquency

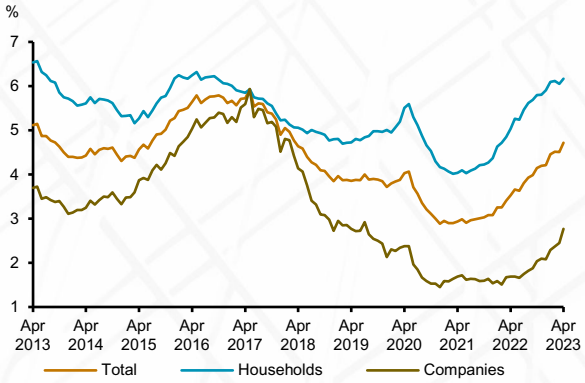
25/ National Program of Support to Micro and Small Companies.

26/ Emergency Credit Access Program in the guaranteed modality.

27/ Further information on the estimation of financial flow are available in the box Financial flow and credit stimulus, of the September 2021 IR.

28/ A negative flow indicates that the value of credit granting is lower than the value of payments.

Figure 1.2.23 – Non-earmarked 90 days past due loans



increase in this segment was concentrated on small and medium-sized enterprises, but in 2023 there is an increase associated with large companies, particularly in the modality of discount of receivables starting in April. As for non-earmarked household operations, the delinquency rate is at a level similar to that of 2016. In 2022, delinquency rose strongly in the high cost credit modalities and remained relatively stable in the low cost modalities. In this respect, it is worth highlighting that the Provisional Measure 1,176/2023 was issued establishing the program *Desenrola Brasil*, aimed at stimulating the renegotiation of household debts. The launch of this program still depends on regulation through an act of the Ministry of Finance and the implementation of an electronic auction system.

Data from the latest Quarterly Survey on Credit Conditions (PTC)[29], carried out in April with financial institutions, indicate a tightening of conditions for credit granting in 2023Q1, especially to large companies and in household real estate credit. Looking ahead, the survey suggests the prospect of maintaining a relatively restrictive credit supply over the next months, especially for the real estate segment, where negative factors cited were the cost and availability of funding and the level of commitment of consumers' income with debt service.

Considering the recent credit trajectory and the economic prospects for 2023, the projection for credit growth in 2023, detailed in a box of this IR, rose from 7.6% to 7.7%.

Fiscal

The consolidated public sector registered a primary surplus of BRL 79 billion in the first four months of the year, a sharp decline over the same period of 2022 (BRL 148 billion). The surplus dropped for the Central Government, regional governments, and state-owned enterprises. This result was largely positively influenced by a good performance in January, when Central Government expenses still did not fully reflect the impact of Constitutional Amendment (EC) 126/2022 and regional governments achieved their best real primary balance for this month since the start of the time series in 2001.

Table 1.2.4 – Public Sector Borrowing Requirements - Primary balance[1]

Accumulated in the year until April

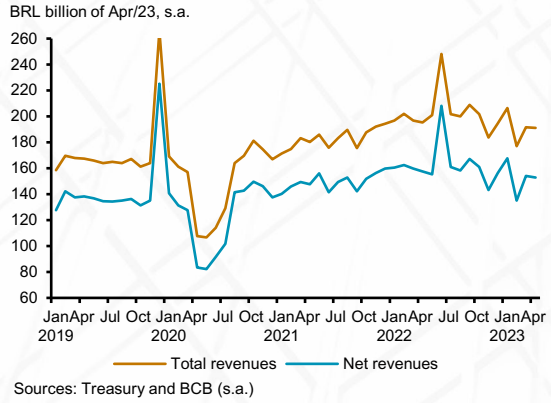
BRL billion

Itemization	2021	2022	2023
Central Government	-41	-80	-47
o/w Federal Government	-117	-159	-126
o/w INSS	76	79	79
Regional governments	-33	-62	-33
State-owned companies	-2	-6	2
Total	-76	-148	-79

[1] Positive values represent deficit and negative values represent surplus

29/ Data can be accessed in the BCB's Time Series Management System (SGS), section "Credit Indicators" and subsection "Quarterly credit conditions survey". Further details on the PTC methodology in Annibal, Clodoaldo, and Koyama, Sérgio (2011), "*Pesquisa Trimestral de Condições de Crédito no Brasil*", BCB, Working Paper 245.

Figure 1.2.24 – Central Government revenues



Sources: Treasury and BCB (s.a.)

Figure 1.2.25 – Primary balance - regional governments

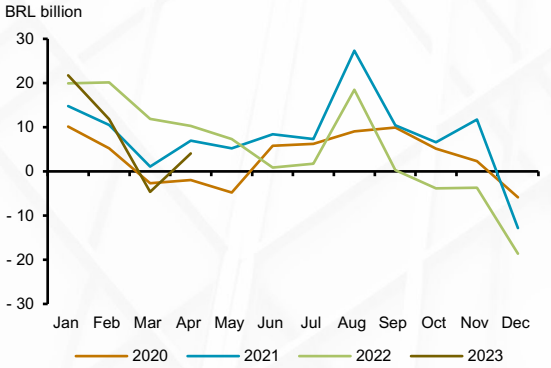


Figure 1.2.26 – Forecasts for the Central Government primary balance

Sources: BCB and Ministry of Finance

As for the Central Government, the reduction of the primary surplus reflected both the decline of real revenues (-2.2%) – mostly reflecting tax exemptions and the effects of lower commodity prices on the revenues of exploitation of natural resources – as the increase in real expenses (2.8%) – reflecting the increase in the spending cap authorized by EC 126, which allowed to accommodate larger expenses on social programs. Compulsory expenses with controlled cashflow, which include *Bolsa Família* payments, registered the largest real expansion in the period (BRL 29.2 billion).[30] Conversely, the largest declines occurred in salary allowances and unemployment insurance (-BRL 10.1 billion), due to the change in payment schedule in 2023; and extraordinary credits (-BRL 11.7 billion), whose values for the first four months of 2022 were still impacted by measures for fighting Covid-19, with no corresponding impact in this year.

At the regional level, the loss of revenue resulting from the reduction in the rates of the State Tax on Circulation of Goods and Services (ICMS) rates on fuels, energy, and telecommunications – Complementary Law (LC) 194/2022, effective from the second half of 2022, continued to negatively influence the fiscal results of federal units. This reduction, however, was mitigated both by efforts to recompose revenues[31] and by the impact on Motor Vehicles Property Tax (IPVA) revenues of higher automobile prices. It should be noted that, as established by LC 192, the ICMS rates on fuels were set and will now be charged only once and with a fixed value per unit of measurement.[32] In fact, this should benefit revenues collection by federal units as of May 2023.

For the long-term perspective of fiscal policy, the most relevant fact since the previous IR was the proceedings of the new fiscal regime, which should replace the previous "spending cap". In this regard, the government sent to the National Congress, on April 18, the Complementary Bill (PLP) 93/2023, which, as of the cut-off date of this IR, was being processed in the Senate after being approved by the House of Representatives on May 24. The text establishes a new rule for the real growth of expenses linked to the revenue variation: the increase will be limited to 70% of the real revenue gain in the

30/ In August 2022, the minimum value paid by the program *Auxílio Brasil/Bolsa Família* was increased from BRL 400 – which was in effect at the beginning of 2022 – to the current value of BRL 600.

31/ Rates have been increased by some federal units. Additionally, an agreement of BRL 26.9 billion was signed between the federal government and federal units regarding the compensation for the loss of revenues incurred by these states due to LC 194.

32/ The rates changed from ad valorem to ad rem on May 1st for LPG and diesel, and on June 1st, for alcohol and gasoline.

Table 1.2.5 – PCQ: Fiscal forecasts Copom 255 (Jun 23)

	Central Gov. primary balance (BRL billion)	Regional Gov. primary balance (BRL billion)	PSND (% GDP)	GGGD (%GDP)
2023	-110	12	61	76
2024	-91	10	64	80

Table 1.2.6 – PCQ: Assessment of fiscal situation

%

Copom	Month	Worsened	No relevant changes	Improved
245	Mar, 22	50	28	22
246	May, 22	24	57	19
247	Jun, 22	69	23	8
248	Aug, 22	93	4	3
249	Sep, 22	46	44	9
250	Oct, 22	21	72	7
251	Dec, 22	91	9	0
252	Feb, 23	66	28	6
253	Mar, 23	12	69	19
254	May, 23	26	46	28
255	Jun, 23	10	48	42

Results above refer to the PCQ question: "How do you evaluate fiscal developments since the previous Copom, considering both your baseline scenario and related risks?"

Table 1.2.7 – PCQ: Recomposition of revenues incorporated into the projection

BRL billion

	Central Gov. primary balance (BRL billion)	Regional Gov. primary balance (BRL billion)
Percentile 75	64	89
Median	40	60
Percentile 25	20	35

The results above refer to the following PCQ question: "Of the economic measures presented or under discussion to recompose revenues, what value is incorporated in your projection of net revenue from the Central Government?"

12-month period ending in June of the year before the Budget Law, and cannot be lower than 0.6% or higher than 2.5%.

With the so-called Sustainable Fiscal Regime, the federal government intends to meet the primary balance targets indicatively defined in the 2024 Budget Guidelines Bill: 0.0% in 2024; 0.5% in 2025; and 1.0% in 2026, in terms of GDP percentage. According to the PLP text, the target will be considered met if the balance is not below 0.25 p.p. of the established target. The fulfillment of the target (for year *t*) will only be assessed in the following year (*t+1*), when data for December is released. In case of non-compliance, adjustment measures are immediately set off to contain the advance of expenses (triggers)[33] and the real growth of expenses in the year following the calculation (*t+2*) becomes limited to 50% of the real revenue gain. In case the primary balance exceeds the target by 0.25 p.p., there will be the possibility of additional expenditure increases.

The fulfillment of the indicated primary balance targets will require a relevant and permanent growth of revenues[34]. The Ministry of Finance have been working in this direction. In January were announced measures with a potential impact on the primary balance mainly regarding the expansion of revenues. Since the March 2023 IR, new measures have been presented or are still under discussion. The Ministry of Finance has also signaled its interest in reducing tax benefits.[35]

The approval of the new fiscal regime by the House of Representatives and the announcement of measures for increasing revenues, however, have not yet significantly impacted analysts' projections for fiscal variables. In the Pre-Copom Questionnaire (PCQ), despite the substantial increase in the number of respondents indicating an improvement in the fiscal outlook when considering both the central scenario and involved risks, median projections for the primary balance of the central government for 2023 and 2024 remained virtually unchanged compared to forecasts at the time of the March 2023 IR. The median

33/ In this case, the government will not be able to create new job positions, obligatory expenses, or increase incentives. The triggers become more restrictive if non-compliance persists in the subsequent year, with new restrictions that include a ban on wage adjustments to the civil servants. These same restrictions, except for the concession of tax benefits, will apply if mandatory expenses exceed 95% of primary expenses.

34/ Simulations carried out by the Independent Fiscal Institution (IFI) in its Nota Técnica nº 52 (Portuguese only) suggest that the proposal of the new fiscal framework is heavily dependent on the expansion of revenues, which is still uncertain.

35/ See section "Sustainable Fiscal Regime" in the May 2023 edition of the Boletim MacroFiscal (Portuguese only) of the Economic Policy Secretariat of the Ministry of Finance.

Table 1.2.8 – External accounts

Year to date untill April				USD billion
Itemization	2020	2021	2022	2023
Current account	-18	-18	-16	-14
Balance on goods	4	5	15	19
Exports	66	82	103	105
Imports	62	77	88	86
Services	-9	-7	-12	-10
of which: travel	-1	-0	-2	-2
of which: transportation	-3	-4	-6	-4
Primary income	-14	-18	-21	-23
of which: Interests	-8	-8	-7	-9
of which: dividends	-6	-10	-13	-14
Investment - liabilities	-6	33	42	31
DI liabilities	14	26	34	24
Portfolio investments	-30	8	-3	4
Other investments[1]	10	-2	11	3

1/ Includes loans, commercial credits, deposits and other investments

Figure 1.2.27 – Current account

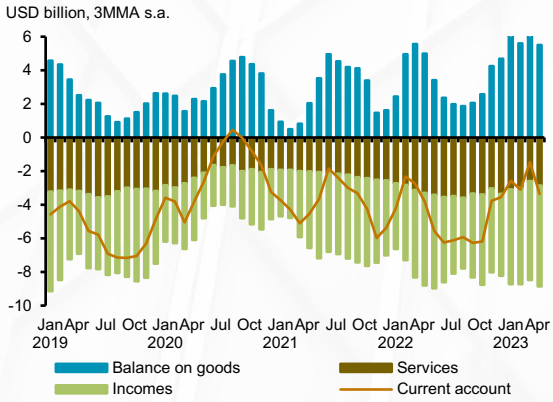
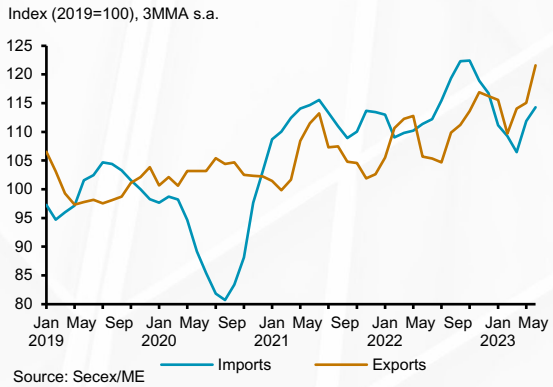


Figure 1.2.28 – Quantum Index



Source: Secex/ME

response for the 2024 balance is of a deficit of BRL 91 billion (0.8% of GDP), therefore, far from the target of 0%. Possibly, this difference is the result of the dependence on recomposition of revenues, which is still uncertain, to meet the primary targets. So far, according to the PCQ median, the value of economic measures for revenue recomposition already incorporated into the fiscal projections is of BRL 40 billion in 2023 and BRL 60 billion in 2024, amounts close to 0.4% and 0.5% of GDP, respectively.[36] In the long term, debt projections continue to show upward trajectories, both in the Focus Report and in the PCQ, indicating that the fiscal outlook still calls for caution.

External accounts

In the first four months of 2023, external accounts continued to show positive dynamics. The current account deficit decreased in the last months, accumulating USD 14 billion from January to April, the lowest value for this period since 2017. In the financial account, net inflows of direct investment liabilities declined, in line with expectations for the year, coupled with net inflows of portfolio investments.

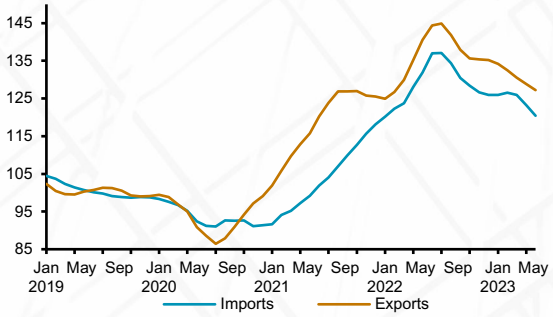
The trade balance in the period was strong, reaching USD 19 billion, the largest value for the period since the beginning of the time series in 1995 (BPM6). The value of exports remained high, driven by significant volumes sold of grain (soybeans and corn), poultry, and cellulose, along with prices that had not yet fully reflected the decline in commodity prices in international markets. In turn, imports, mostly of intermediate goods, are lower than in mid-2022, when greater stress in supply chains favored the buildup of precautionary inventories.

In the services account, the USD 10 billion deficit accumulated from January to April is moderately lower than that of the same period in 2022 (USD 12 billion). As expected, expenses on transportation services dropped due to both the reduction of the imported volume and the decline in international freight prices, which also reflects the easing of logistical bottlenecks and of international oil price. On the other hand, travel expenses continue to show a slow recovery but remain depressed when compared with the pre-pandemic period.

36/ Accordingly, in the *Relatório de Acompanhamento Fiscal* of June 2023 (Portuguese only) the IFI revealed the incorporation of an impact of BRL 65 billion in 2023 and BRL 91 billion in 2024. According to the IFI survey, the impact announced by the Ministry of Finance is of BRL 137 billion in 2023, and BRL 252 billion in 2024.

Figure 1.2.29 – Price Index

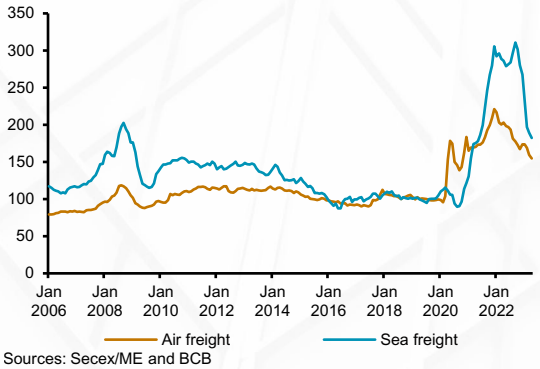
Index (2019=100), 3MMA s.a.



Sources: Secex/ME and BCB (seasonal adjustment)

Figure 1.2.30 – Transportation costs

2019 = 100



Sources: Secex/ME and BCB

Figure 1.2.31 – Portfolio investment - liabilities

USD billion, 3MMA s.a.

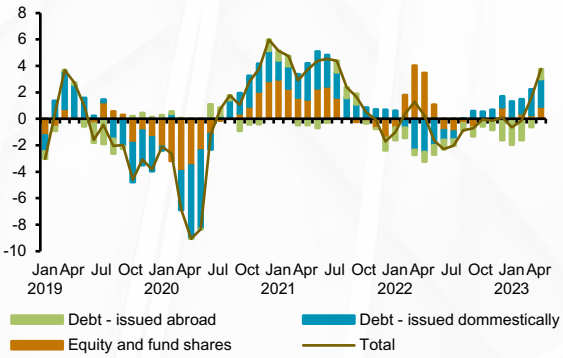
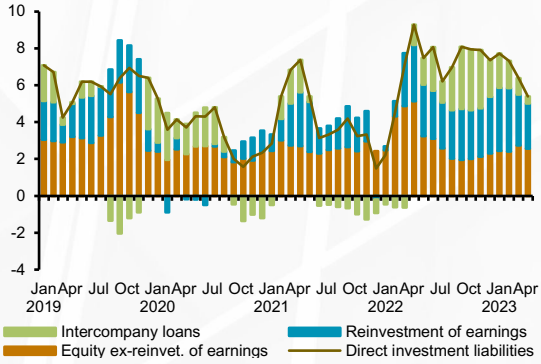


Figure 1.2.32 – Direct investment liabilities

USD billion, 3MMA s.a.



The primary income account deficit rose to USD 23 billion. Interest expenses increased, starting to reflect more clearly the tightening of financial conditions in leading economies. Income expenses, which were already at a relatively high level, also increased, possibly reflecting the good domestic activity performance in early 2023, especially in sectors like agriculture and livestock and extractive industry.

In the financial account, after the substantial result obtained in 2022, net inflows of direct investment liabilities declined in the early months of 2023. The main component underlying this reduction was intercompany operations. In the other IDP component, equity capital, it is observed that the reinvestment of earnings, after positive results in January and February, slowed down in March and April.

Net inflows of portfolio investment liabilities, in turn, were positive in the January-April period. The main highlight was the net inflow into domestic securities, a market in which government issued bonds predominate. This movement might suggest an improvement in the perception of fiscal risk by non-resident investors sufficient to offset the reduction in the differential of the domestic interest rate in relation to interest rates observed in leading global economies. Conversely, net amortizations prevailed in the account of securities abroad until March, possibly due to the increased funding cost abroad. In April, however, the National Treasury carried out a large bond issuance worth USD 2.25 billion, which might represent a positive signal for Brazilian companies to resume external fundraising.

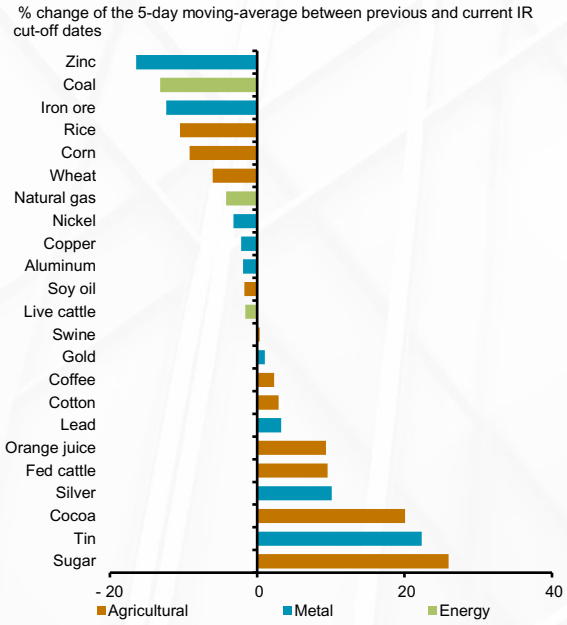
Considering data released since the March 2023 IR and the evolution of the prospects for economic activity and prices, mainly of commodities, the forecasts for the external accounts in 2023 have been revised and are presented in detail in a box of this IR. The projection for the current account deficit is of USD 45 billion, against USD 32 billion in the March 2023 IR, and, for direct investment liabilities, of USD 75 billion, the same value expected in the previous three Inflation Reports, characterize a comfortable scenario for the Brazilian external accounts.

Prices

Figure 1.2.33 – IC-Br and foreign exchange rate

Sources: Bloomberg and BCB

Figure 1.2.34 – Change in commodity prices (USD)



Source: Bloomberg

The 12-month inflation has continued to decline since the March 2023 IR, both in the aggregate measure and in the several measures of underlying inflation. In the quarterly metric, consumer inflation and core indicators also declined in the period, although remaining at a high level, not consistent with the fulfillment of the inflation target. Disinflation was stronger for industrial goods and food. The BRL appreciation and the decline of producer prices, both agricultural and industrial, suggest the continuity of this movement over the next months. Conversely, underlying services inflation increased in the quarterly metric, in line with the scenario of slower disinflation in this segment. Overall, the evolution of price indicators since the previous IR led to a relevant reduction of inflation expectations for 2023. Expectations for longer horizons registered lower declines.

The Commodities Index – Brazil (IC-Br) increased 3.3% in the quarter, when measured in USD, following a 9.9% decline in the previous quarter.[37] The rise in commodity prices was followed by a strong BRL appreciation, such that the index dropped 4.9% when measured in local currency.

By segment, and considering USD prices, the only decline was observed in energy commodities (-3.4%), with a notable reduction in the price of coal. The prices of Brent-type oil and natural gas registered lower declines. Metal commodities rose by 3.2%, despite a relevant decline in the price of iron ore, which has reacted to the performance of the infrastructure and real estate sectors in China and the expectations of lower demand for steel in the country in the next months.

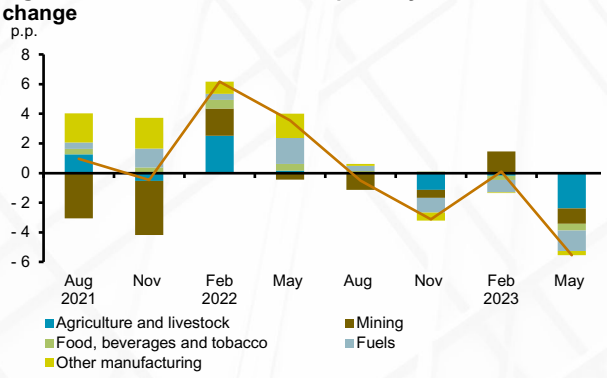
Still considering USD prices, agricultural commodities increased 5.0%. There were declines in the prices of grains (rice, corn, and wheat) and soybean oil, but the upward movement of other commodities prevailed, with notable increases of sugar, cocoa, and fed cattle.

From a macroeconomic perspective, the prospect of a global economy deceleration persists, under the influence of the monetary policy tightening in advanced and emerging countries, affecting the demand for commodities. In turn, the war in Ukraine remains a relevant risk for supply, especially

37/ The IC-Br and exchange rate variations discussed in this section always refer to the 5-day moving average between the respective IR closing dates.

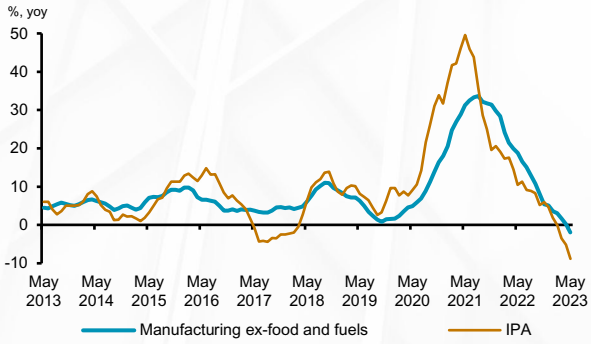
of agricultural and energy commodities. The confirmation of the climatic phenomenon *El Niño* in June and the possibility of it being stronger also represent a risk for the supply of agricultural goods, even though it might benefit the harvest of grains in the American continent. Finally, the recovery of the Chinese economy after the end of the Zero-Covid policy has not brought clear pressures on commodity prices, although it still represents a relevant risk from the demand side.

Figure 1.2.35 – Contributions to quarterly IPA-DI change



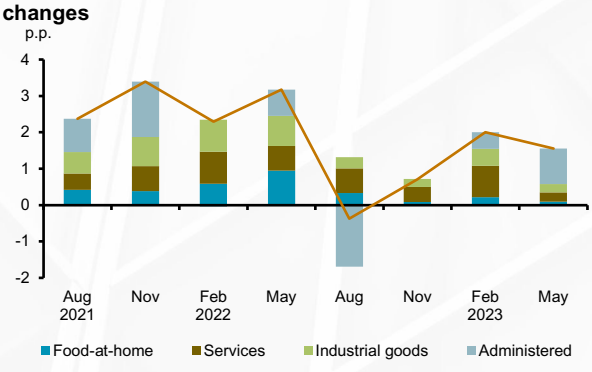
Source: FGV

Figure 1.2.36 – IPA-DI and manufacturing ex-food and fuels



Source: FGV

Figure 1.2.37 – Contributions to IPCA quarterly changes



Sources: IBGE and BCB

The Producer Price Index (IPA-DI) declined 5.55% in the Mar-May quarter, after remaining relatively stable in the previous quarter (0.09%). The 12-month change, which had reached a high level of 49.59% in May 2021, dropped to -8.89% in May 2023. This is the highest negative change since the start of the time series in 1996, mainly reflecting the behavior of commodity prices.

In the QoQ comparison, the price of agricultural products declined again (-8.41%), with a significant contribution of the drop of soybeans and corn. In addition to the decline in the international reference prices and the BRL appreciation, domestic prices of soybeans and corn have been pressured by difficulties with transportation and storage caused by the record harvest, especially for corn. Still in this group, it is worth mentioning the decline in the prices of cattle and the increase in the prices of milk and eggs. The decline in the prices of cattle is observed even after the resumption of beef exports to China in March, suspended for one month due to an atypical case of bovine spongiform encephalopathy, commonly called "mad cow disease" in the state of Pará. This decline, observed in the IPA and in the prices of cattle in the physical markets, was also observed in the futures prices of fed cattle in the domestic market, and has been justified by the context of high supply.

Among industrial goods (-4.42%), prices in extractive industry reverted to decline (-13.42%) and the decline in manufacturing prices was intensified (-3.33%). In the case of the extractive industry, prices of iron ore dropped 16.09%, after increasing 28.27% in the previous quarter, following the trend of international prices. In manufacturing, there was a significant contribution of petroleum product prices, which declined 14.99%, after a decrease of 8.27% in the Dec-Feb quarter. Among price increases, sugar and trucks and buses stood out.[38] In general, the behavior

38/ The increase in truck and bus prices possibly reflects the regulatory requirement to adapt these vehicles to the Euro 6 system, as of January 2023, replacing the Euro 5 standard, in force until the end of 2022.

of producer prices in the quarter remains compatible with the moderation of goods inflation, even though the drops are concentrated in raw materials and intermediate goods. Final consumption goods, excluding fuels and food, show a strong slowdown since 2022, but with monthly variations that are still positive in the IPA.

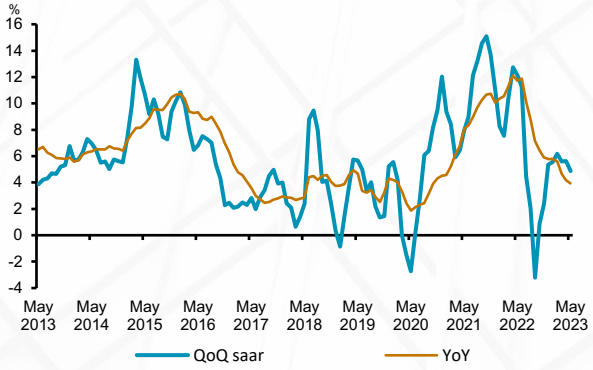
Consumer prices advanced 1.56% in the Mar-May quarter, showing a lower increase than that seen in the Dec-Feb quarter (2.00%). In general, there was a strong slowdown of market price inflation and acceleration in administered prices, movements only partially explained by the seasonality of each segment.

The result for the quarter implied a new decline in the 12-month IPCA, from 5.60% in February to 3.94% in May. In the same comparison basis, the average of the core inflation measures also decelerated, from 8.45% in February to 6.72% in May. The level difference between the average of the cores and the headline IPCA in the 12-month change reflects, in part, the effect of tax breaks in 2022 and the pass-through to the domestic market of the drop in international prices of oil and petroleum products. In both cases, the average of the cores is less affected than overall inflation.

In the seasonally adjusted and annualized quarterly series, in a shorter-term perspective, the average of the cores reached 5.53% in the Mar-May quarter, compared to 6.44% in the Dec-Feb quarter. The result is in line with the path of disinflation observed since mid-2022, but measures of underlying inflation remain high and at a level incompatible with meeting the inflation target.

Among segments, food prices rose 0.59% in the Mar-May quarter, down from 1.35% in the Dec-Feb quarter. This deceleration was partly seasonal but can also be observed in the seasonally adjusted series. Among the main contributions to the movement, fruit prices benefited from improved weather conditions; rice prices slowed down reflecting the harvest at the beginning of the year; and oils and fats continued to fall, in line with the evolution of soybean oil in wholesale market. Beef prices also continued to fall, with the pass-through of lower fed cattle prices, already mentioned. In the opposite direction, milk and dairy products showed stronger increases than in the previous quarter. This typical movement for the period, was less intense than the one observed

Figure 1.2.38 – IPCA



Sources: IBGE and BCB

Figure 1.2.39 – Average of core inflation measures

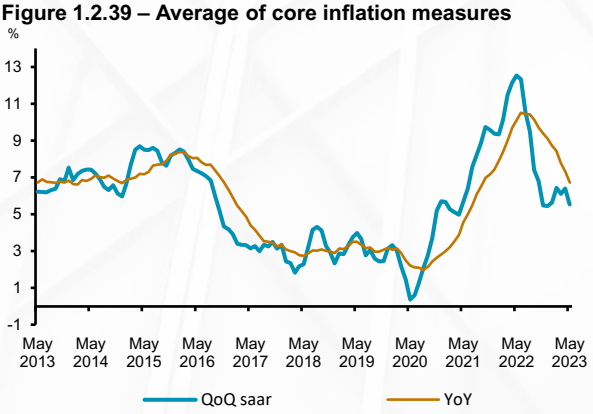
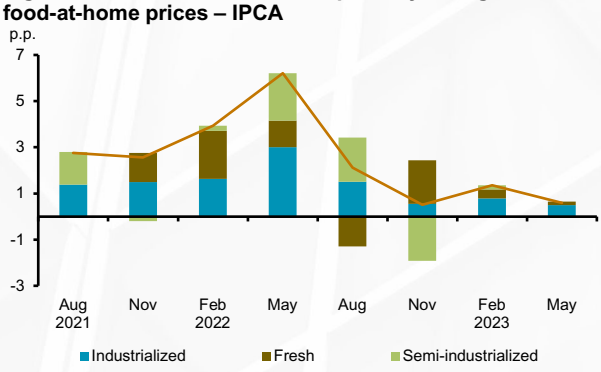
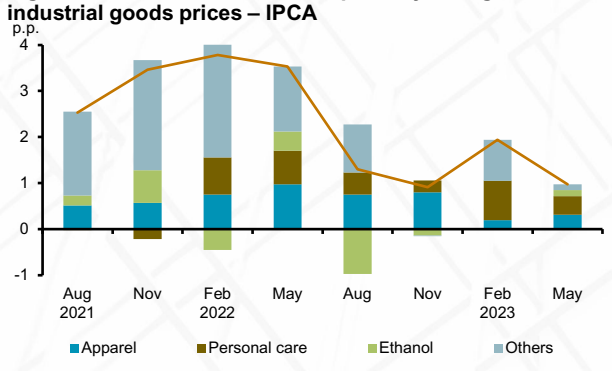


Figure 1.2.40 – Contributions to quarterly changes in food-at-home prices – IPCA



Sources: IBGE and BCB

Figure 1.2.41 – Contributions to quarterly changes in industrial goods prices – IPCA



Sources: IBGE and BCB

Figure 1.2.42 – Industrial goods inflation

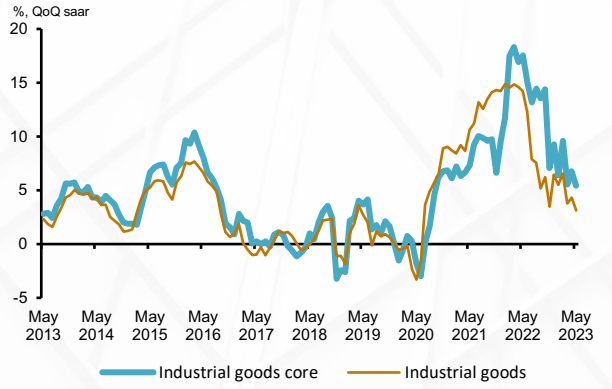
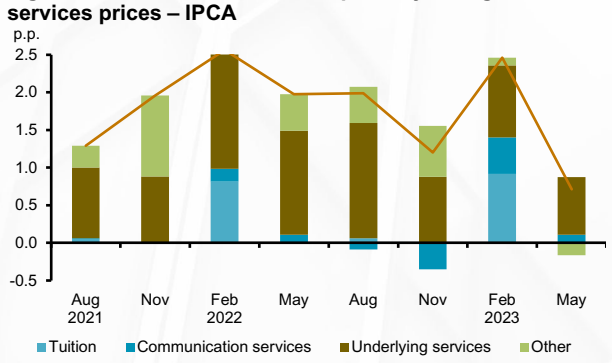
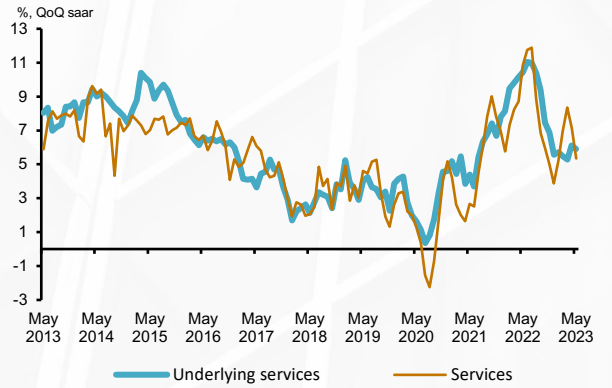


Figure 1.2.43 – Contributions to quarterly changes in services prices – IPCA



Sources: IBGE and BCB

Figure 1.2.44 – Services inflation



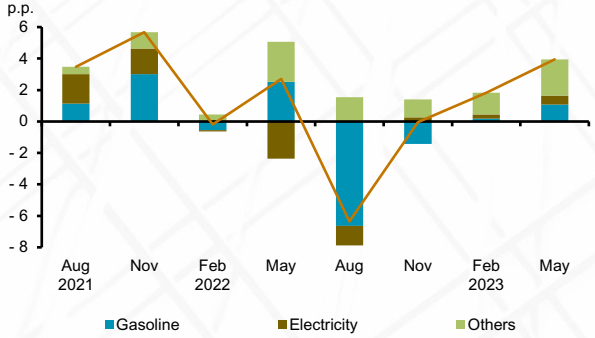
in 2022, when supply was affected by a drought and a drop in animal productivity. Industry reports also indicate that the supply of imported products has limited the rise in dairy prices this year.

The prices of industrial goods also decelerated in the period, with a change of 0.97% in the Mar-May quarter, against 1.94% in the Dec-Feb quarter. This movement was partly due to the slowdown of personal hygiene prices, a group that has presented high volatility. But there were also lower price changes in such items as electrical appliances, new vehicles, furniture and utensils, and motorcycles. In the opposite direction, there were stronger increases in apparel and ethanol. The movement in apparel is typical of the period, with the end of the promotions period at the beginning of the year, while the rise in ethanol reflected exceptional factors, such as the reinstatement of federal taxes on gasoline in March and the slower start of the sugarcane harvest due to rains in producing regions. Overall, the deceleration of industrial goods in the quarter does not seem to be determined by seasonal factors and can be seen in a similar magnitude in the seasonally adjusted series.

Service prices in the Mar-May quarter varied 0.71%, a significant reduction from the 2.46% increase in the Dec-Feb quarter. This deceleration was largely concentrated in ex-underlying services (-0.13%, compared to 3.73%). In addition to the reduced variations in tuition, usual in the period, there was a slowdown in prices of communication services, a group with infrequent price variations in the IPCA and which had shown a high increase in the previous quarter. In the underlying component, less volatile, the deceleration was smaller, with a 1.29% increase in the quarter, against 1.61% in the Dec-Feb quarter. In the seasonally adjusted series, however, there was a moderate rise in underlying inflation in services, with an annualized variation of 5.91% in the Mar-May quarter, against 5.48% in the Dec-Feb quarter. This increase supports the view of a slower disinflation process in this component.

Finally, administered prices inflation rose sharply from 1.84% in the Dec-Feb quarter to 3.94% in the Mar-May quarter, with significant contributions from gasoline prices, pharmaceutical products, residential electricity, games of chance, and bus fares. Regarding electricity, in addition to the usual adjustments in distributors with high share in the IPCA, there was the impact of the increase in the

Figure 1.2.45 – Contributions to quarterly changes in administered prices – IPCA

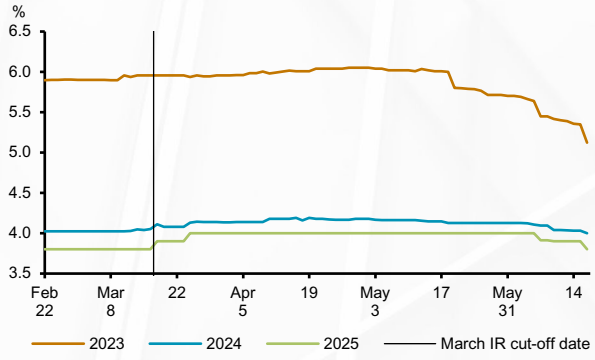


Sources: IBGE and BCB

Table 1.2.9 – Breakdown of the revision on the 2023 Focus survey

	Weights	Focus expectations (% p.a.)		
		Mar-17	Jun-16	Contr. to ” (p.p.)
IPCA	**100**	**5.95**	**5.12**	**-0.83**
IPCA (by aggregation)	100	5.96	5.20	-0.77
Food-at-home	16	3.53	1.46	-0.33
Industrial goods	24	3.74	2.88	-0.21
Services	35	6.20	5.75	-0.16
Administered prices	25	9.36	9.09	-0.07
Market prices	75	4.85	3.96	-0.67
Market prices (by aggreg.)	75	4.83	3.82	-0.77

Figure 1.2.46 – Median market expectations (Focus) – 2023 to 2025 IPCA



ICMS calculation basis on residential electricity. [39] The increase in pharmaceutical products, in turn, is seasonal and responds to the adjustment of the maximum prices of regulated drugs, with a more pronounced impact in April. As for urban buses, the increase was influenced by the adjustment of fares in Belo Horizonte, in effect since the beginning of May, but with the possibility of reversal being discussed. The high variation in games of chance reflected an increase in the price of lottery games managed by the Caixa Econômica Federal, after three years without price changes. Finally, gasoline prices responded to the partial reinstatement of federal taxes on the product at the beginning of March.[40] The impact of the reinstatement was attenuated by reductions in the price to the distributor by Petrobras in March (-3.9%) and in May (-12.6%).

The median expectation for inflation in 2023 decreased since the previous IR from 5.95% to 5.12%, according to the Focus report. The analysis of the projections disaggregated into segments reveals that the revision was concentrated in the market prices segment, with lower projections mainly for food-at-home, but also for industrial goods and services. This revision is possibly associated both with the benign evolution of producer and consumer prices, described in this section, and with the BRL appreciation in the period.

Inflation expectations for more distant years – which had been rising since December 2022 – declined to a lesser extent and remain unanchored from their respective targets. The slight improvement in inflation expectations observed in the Focus survey may be associated with lower uncertainties regarding the fiscal situation and the perception that a possible increase in the inflation target for the coming years has become less likely.

39/ In early February, the STF suspended the provision of LC 194 that mandated the reduction of the ICMS tax base on electricity. The impact of this decision was observed partially in February, but mostly in March.

40/ The PIS/Cofins tax rates on the products, which had been zero since June 2022, were increased to BRL 0.47/l for gasoline A and BRL 0.02/l for ethanol.

Neutral interest rates: international evidence

The implementation of monetary policy, in any economy, basically depends on the concept of the equilibrium real interest rate, also called neutral or natural rate of interest. The neutral rate is the real interest rate consistent with the economy at full employment and inflation at target. When the ex-ante real interest rate of the economy (usually calculated as the nominal rate expected over the next 12 months deflated by the inflation expectation) is at the same level of the neutral interest rate, the monetary policy is neither contractionary nor expansionary, demand grows in line with the potential economic growth, and inflation is at the target. Therefore, real interest rates above the neutral interest rate reduce inflation and aggregate demand. Conversely, when real interest rates are below the neutral rate, aggregate demand is stimulated and inflation increases.

One of the challenges for monetary policy makers is the estimation of the equilibrium interest rate, since this rate is unobservable and its contemporaneous estimation is subject to high uncertainty. In fact, different models are employed in these estimation, although it is known that there is high uncertainty in this process.

The equilibrium interest rate, in the long run, depends on structural factors that condition savings and investment in an economy. It depends on demographic and distributive factors, on the variation of productivity and the growth rate of potential output, on the economic agents propensity to save, on the long run fiscal outlook, on the capital flow, and on financial system innovations, among others. As these factors vary over time, the equilibrium real interest rate also varies, potentially increasing the inaccuracy of its estimate in real time. Several models,[1] based on different data and structural assumptions, produce estimations for neutral interest rates for several economies. Even though estimates may differ substantially, they are normally based on information that reflect, at different degrees, the economic growth prospects and several aspects of financial conditions (Kaplan, 2018).

Furthermore, with the increase of real interest rates worldwide since 2021 in response to rising inflation rates, a debate arises about how much of this increase in the post-pandemic scenario would be temporary or would be, in fact, the result of changes in equilibrium real interest rates of advanced and emerging economies, reflecting relevant structural changes.

The aim of this box is to discuss the behavior of real equilibrium interest rates in emerging and developed economies in the post-pandemic scenario. The goal is not to infer which was the definitive movement of these rates, after the extraordinary shocks observed over the last years, but to present evidence and neutral rate variations compiled by the literature.

Neutral interest rate in selected developed and emerging countries

In the decades prior to the Covid-19 pandemic, a sharp and sustained reduction in the equilibrium real interest rates has been observed. In some advanced economies, extremely low values, near the zero-lower bound, have been reached. For monetary authorities, this represents an additional challenge as such low values make the conduct of monetary policy more difficult. In the United States, in particular, Mian, Straub, and Sufi (2021) argued that the sharp decline observed in the structural real interest rate raises concerns

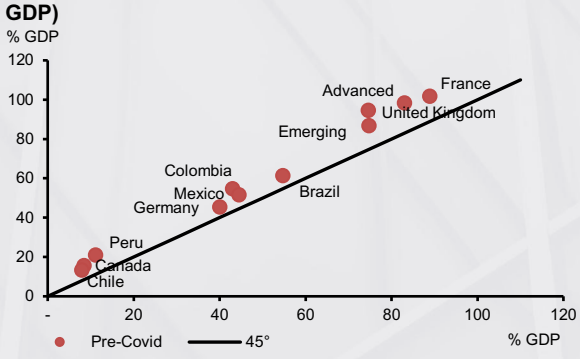
1/ Laubach and Williams (2003), Koenig and Armen (2015), Holston, Laubach, and Williams (2017), Del Negro *et al* (2017).

not only about the loss of monetary policy flexibility, but also about the increased risk of asset bubbles and the possible economic stagnation. On the other hand, Carvalho, Ferrero, and Nechio (2016) focus on the impacts of demographic changes on the reduction of real interest rates after the 90's. The increase of longevity and, as a consequence, of life expectation led to a rise in agents' savings. Conversely, the reduction in population growth rate produces two opposite effects: on the one hand, a decline in the share of labor in production and, therefore, a reduction in the marginal capital productivity; on the other hand, a relative increase in retirees and a fall in savings. The resulting effect of these forces is the reduction of the neutral interest rate.

Similarly to demographic changes, lower sustained productivity growth rates also imply a reduction of the neutral real interest rate (Carvalho *et al*, 2016, Platzer and Peruffo, 2022, and extensive literature). Platzer and Peruffo (2022) show that productivity has been an important factor responsible for a downward pressure on the neutral interest rate over the last decades. Despite the high uncertainty in the measurement of a country's productivity, an analysis of the recent past indicates that innovation (measured by patents issued) accelerated bud did not lead to an increase in productivity, which dropped to the lowest growth rates of the industrial era (Gordon, 2018).

Variables that affect the supply of savings and the demand for investment also help determine the neutral interest rate evolution. The increase in public debt, for instance, by generating a mismatch between the demand by resources and the supply of savings (Figure 1), increases the equilibrium interest rate of the economy (Kocherlakota, 2015). The extent to which this occurs depends on how much of private investment is replaced by additional public debt (Eggertsson, Mehrotra, and Robbins, 2019; Rachel and Summers, 2019). Vast literature indicates the public indebtedness increase as a relevant factor responsible for an upward pressure on the neutral interest rate over the last decades (Figure 1).

Figure 1 – Pre and Post-Covid-19 net public debt (% GDP)

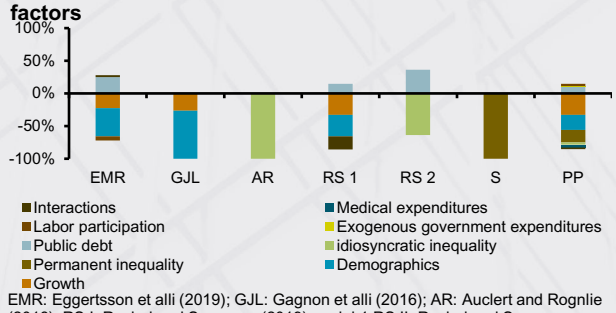


Source: IMF (Fiscal Monitor 2019 and 2022)

The analysis of the determinants of neutral interest rates and their evolution in the long run is a path to assess the future behavior of equilibrium interest rates. In this context, Platzer and Peruffo (2022) seek to explore in a single model several factors that might contribute to changes in neutral interest rate: demographic changes, deceleration in the productivity growth, increased income inequality, and public policies. The model's results suggest that increased income inequality, demographic change, and deceleration in the productivity growth explain most of the decline in neutral interest rate from 1975 to 2015. Growing public indebtedness is the main opposite force. In the long run, the model forecasts a stabilization of the neutral interest rate at a low level, even considering the increase in public indebtedness observed in several countries as a consequence of the pandemic.

Other articles also evaluate other factors, and are summarized by Platzer and Peruffo (2022). Figure 2 shows a summary of the results presented in these articles. In those articles that do not include the increase of income inequality, the preponderant negative factor is demographic transition. As an opposite force, growing public indebtedness should be highlighted.

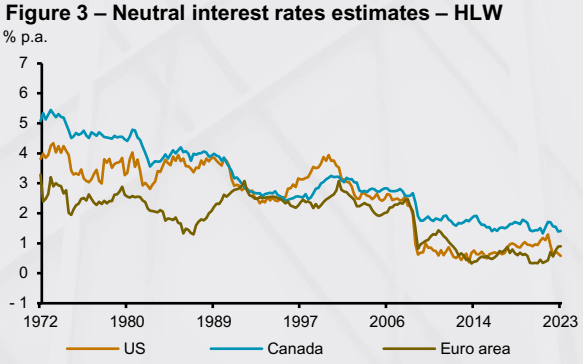
Figure 2 – Neutral interest rate change: contribution by factors



EMR: Eggertsson et alli (2019); GJL: Gagnon et alli (2016); AR: Auclert and Rognlie (2018); RS I: Rachel and Summers (2019) model 1;RS II: Rachel and Summers (2019) model 2;S: Straub (2019); PP: Platzer and Peruffo (2022); Estimates from 1970/80 to 2013/1
Source: Several authors

Laubach and Williams (2003) and Holston, Laubach, and Williams (2017), papers that became reference for the estimation of the equilibrium interest rate in the US and in other developed countries, also show that, as of the 80's, selected advanced countries registered a continuous reduction of neutral interest rate (Figure 3). Before the pandemic, HLW estimates had reached historical lows.

Figure 3 – Neutral interest rates estimates – HLW



Source: Holston-Laubach and Williams (2023)

Even though these papers specifically assess advanced economies, this reduction was also observed in large emerging economies. The World Economic Outlook (April 2023) argues that common factors, in addition to idiosyncratic factors of each country, such as demographic transition and productivity reduction, are fundamental to understand the synchronized decline observed in emerging economies. Increase of income inequality was also a relevant factor.

Nevertheless, in face of the new post-pandemic international scenario, marked by pressured inflation and increased real interest rates, a debate began in the literature and in central banks about the likely impacts of the pandemic on the equilibrium real interest rate. There are questions about the possible movement of the natural interest rate and doubts concerning the perpetuity of these impacts in the long run. Moreover, understanding the factors responsible for these likely changes – either temporary or permanent – is essential to the adequate conduct of economic policies.

Holston, Laubach, and Williams (2023), in a model modified to include the huge effects of the Covid-19 pandemic, do not find evidence of a sustained reversal in the decline of estimated natural interest rate in the US, which clearly occurred in pre-Covid decades. Estimated neutral interest rates in late 2022 are close to the levels estimated immediately before the pandemic (see Figure 3), nearly 0.6%[2]. Del Negro *et al* (2023) estimates, in turn, based on a DSGE model also adapted to deal with the shocks from the Covid-19 pandemic, point to a substantial rate increase in the post-pandemic period, from 0.4%, in the pre-pandemic period, to 3.6% in 2023Q1, and to 2.2% in late 2023, projecting moderate growth in the subsequent years. Both estimates are still subject to a high inaccuracy degree, in view of the shocks observed over the last years.

2/ In the euro area, Houston *et al* (2023) estimated an increase over the period immediately before the pandemic, reaching 0.9%.

Aiming to capture possible changes in the official estimates over the last years, Table 1 and Figure 4 show neutral interest rates in some advanced and emerging economies, obtained from the respective central banks[3], before and after the Covid-19 shock. No clear pattern of behavior is apparent, although there is some indication of higher neutral rates today than in 2019; four countries have higher rates than before the pandemic, two countries have lower rates, and three have maintained their rates over time.

Table 1 – Equilibrium real interest rate

% p.a.

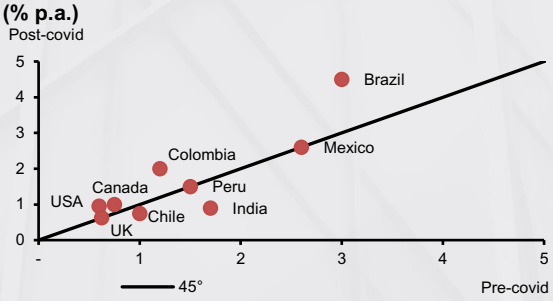
Country	Pre-Covid	Post-Covid
Peru	1.5	1.5
Colombia	1.2	2.0
Chile	1.0	0.8
Mexico	2.6	2.6
India	1.7	0.9
US	0.6	1.0
UK	0.6	0.6
Canada	0.8	1.0
Brazil	3.0	4.5

Source: Central banks, BCB

1/ Estimated.

2/ Brazil: Refers to the estimate published in the December 2020 IR.

Figure 4 – Pre and post-Covid-19 neutral interest rates (% p.a.)



Source: Central banks

1/ Estimated.
2/ Brazil: Refers to the estimate published in the December 2020 IR.

Finally, in an attempt to estimate the long run behavior of equilibrium interest rates, several papers in the recent literature argue that the pattern presented in the pre-pandemic years should last. These are very distinct papers, but their conclusions are similar. Holston, Laubach, and Williams (2023) suggest that the greatest long run impact of the pandemic years would be the reduction of the potential output level and not a change in the neutral interest rate levels. Platzer and Peruffo (2022) believe that, with the deceleration of the productivity growth and the population aging, there will be a convergence of the neutral interest rate of emerging countries towards those of developed countries. They also affirm that factors that are behind the reduction of natural interest rate over the last years will not behave in a very different way in the future, which would imply rates at previously observed levels. Obstfeld (2023) also argues on a similar way.

International experience has not yet definitively identified the effect of the pandemic on the level of natural rates of interest. Even in those countries where monetary authorities estimate an increase in neutral rates in the post-pandemic scenario, with the exception of public indebtedness, there was no change in their main determinants, indicating that the rate may return to the level before the pandemic. Nevertheless, given the huge importance for the monetary policy, central banks should remain vigilant and closely monitor the path of equilibrium real domestic and foreign interest rates, considering the uncertainty about such a real-time estimate.

3/ For the cases in which official estimates are presented as intervals, the central point of the interval was selected.

References:

AUCLERT, A.; and ROGNLIE, M. (2018). "Inequality and Aggregate Demand." National Bureau of Economic Research, Inc NBER Working Papers 24280.

BANCO CENTRAL DO BRASIL (2017). Inflation Report Box "Structural interest rates and monetary policy in Brazil", September.

BANCO CENTRAL DO BRASIL (2012). Inflation Report Box "Evolution of equilibrium real interest rate in Brazil", September.

BANCO CENTRAL DO BRASIL (2010). Inflation Report Box "Equilibrium real interest rate", September.

CARVALHO, C.; FERRERO, A. and NECHIO, F. (2016). "Demographics and Real Interest Rates: Inspecting the Mechanism". European Economic Review, 88, 208–226.

DEL NEGRO, M.; GIANNONE, D.; GIANNONI, M. and TAMBALOTTI, A. (2017). "Safety, Liquidity, and the Natural Rate of Interest". Brookings Papers on Economic Activity, Spring, 235–316.

EGGERTSSON, G. B.; MEHROTRA, N. R. and ROBBINS, J. A. (2019). "A Model of Secular Stagnation: Theory and Quantitative Evaluation", American Economic Journal: Macroeconomics, 11(1): 1-48.

INTERNATIONAL MONETARY FUND, WORLD ECONOMIC OUTLOOK (2023). "A Rocky Recovery", April.

GAGNON, E.; JOHANNSEN, B. K. and LOPEZ-SALIDO, D. (2016). "Understanding the New Normal: The Role of Demographics", Board of Governors of the Federal Reserve System (US) Finance and Economics Discussion Series, 2016-080.

GORDON, R. (2018). "Why Has Economic Growth Slowed When Innovation Appears to be Accelerating?" NBER Working Paper 24554.

HOLSTON, K.; LAUBACH T. and WILLIAMS, J. (2023). "Measuring the Natural Rate of Interest After COVID-19". Federal Reserve Bank of New York Note.

HOLSTON, K.; LAUBACH T. and WILLIAMS, J. (2017). "Measuring the Natural Rate of Interest: International Trends and Determinants". Journal of International Economics vol. 108, Sup.1, S59-S75.

KAPLAN, R. (2018). "The Neutral Rate of Interest". Available at: https://www.dallasfed.org/news/speeches/kaplan/2018/rsk181024

KOCHERLAKOTA, N. (2015). "Fiscal Policy and the Long-Run Neutral Real Interest Rate." Bundesbank Conference - Frankfurt, Germany, July.

KOENIG, E. and ARMEN, A. (2015). "Assessing Monetary Accommodation: A Simple Empirical Model of Monetary Policy and Its Implications for Unemployment and Inflation". Federal Reserve Bank of Dallas Staff Papers, 23.

LAUBACH, T. and WILLIAMS, J. (2003). "Measuring the Natural Rate of Interest: The Review of Economics and Statistics, vol. 85(4), 1063-1070.

MIAN, A.; STRAUB, L. and SUFI, A. (2021). "What Explains the Decline in r*? Rising Income Inequality Versus Demographic Shifts" Working Paper · NBER Working Paper 2021-104, University of Chicago.

NATAL, J. and BARRETT, P. (2023). "Interest Rates Likely to Return to Pre-Pandemic Levels When Inflation is Tamed". IMF Blog, April.

OBSTFELD (2023). "Natural and Neutral Real Interest Rates: Past and Future". Prepared for the 10th Asian Monetary Policy Forum, Singapore, May 25-26.

PLATZER, J. and PERUFFO, M. (2022). "Secular Drivers of the Natural Rate of Interest in the United States: A Quantitative Evaluation". Working Paper IMF, February.

RACHEL, L. and SUMMERS, L. (2019). "On Secular Stagnation in the Industrialized World." National Bureau of Economic Research, Inc NBER Working Papers 24280. 26198.

STRAUB, L. (2019). "Consumption, Savings, and the Distribution of Permanent Income." Invited for resubmission after review - Econometrica.

Revision of the 2023 GDP projection

The central projection for Gross Domestic Product (GDP) growth in 2023 rose from 1.2% to 2.0%. The revision mainly reflects positive surprises in some industry and services sector activities in 2023Q1, as well as improved prospects for agriculture and livestock.

Table 1 – Gross Domestic Product
Accumulated in the year

			% growth
Itemization	2022	2023[1]	
		Previous	Current
Agriculture and livestock	-1.7	7.0	10.0
Industry	1.6	0.3	0.7
Mining	-1.7	2.3	3.5
Manufacturing	-0.3	-0.4	-0.8
Construction	6.9	-0.2	-1.1
Public utilities	10.1	0.4	5.0
Services	4.2	1.0	1.6
Trade	0.8	-0.2	0.8
Transportation and storage	8.4	0.1	2.0
Information services	5.4	3.2	2.3
Financial and related services	0.4	1.6	3.0
Other services	11.1	1.8	2.1
Real estate	2.5	1.8	2.1
Public admin., health and education	1.5	0.4	0.7
Value added at basic prices	3.0	1.3	2.1
Taxes on products	2.1	0.3	1.1
GDP at market prices	**2.9**	**1.2**	**2.0**
Household consumption	4.3	1.5	1.6
Government consumption	1.5	0.7	1.0
Gross fixed capital formation	0.9	0.0	-1.8
Exports	5.5	2.4	3.7
Imports	0.8	-0.5	0.0

Source: IBGE and BCB
1/ Estimated.

Despite the increased annual change estimate, the projection continues to reflect a prospective scenario of decelerating economic activity in 2023, influenced by the slowdown in the pace of global growth and the cumulative impacts of domestic monetary policy. The forecast of modest quarterly changes for industry and services throughout the rest of the year was maintained. Agriculture and livestock should have a distinct evolution, reflecting prospects for the various agricultural crops and the distribution of their harvests throughout the year. After the strong increase in 2023Q1, driven by the record harvest of soybeans, the sector is expected to decline in the following quarters, contributing to the GDP deceleration, both by its direct impact and by its influence on the other sectors. Regarding the domestic demand components, 2023Q1 results did not differ substantially from expectations, confirming the forecast of loss of momentum, which should continue in the coming quarters.

From the production standpoint, the increase in the annual GDP projection in relation to that published in the previous IR reflects an increase in the projections for the three sectors.

The projection for agriculture and livestock growth increased from 7.0% to 10.0%, mainly reflecting the improved prospects of the IBGE for agricultural production, notably of soybeans, second-crop corn, and sugar cane.[1] The revision in the estimate for the soybean production has already been largely captured in the 2023Q1 result, while the more favorable forecasts for the other products contribute to raise the projection in the following quarters.

In industry, the projection was raised from 0.3% to 0.7%, with higher growth in mining and in utilities. The mining expansion was higher than expected in 2023Q1, accumulating a 7.7% growth over four consecutive quarters, and leaving a high statistical carry-over for the year. The utilities sector benefited in 2023Q1 from

1/ The forecast for grain production increase in 2023 presented in the Systematic Survey of Agricultural Production (LSPA) rose from 13.3% to 16.1% since the March 2023 IR. The forecast for the sugar cane harvest was increased from 1.3% to 6.6%.

the reduced participation of thermal power plants in the total electricity produced[2], a factor that should continue contributing to the sector's GVA throughout the year, in a scenario of hydroelectric reservoirs at comfortable levels and the greater energy supply from wind and photovoltaic plants. In the opposite direction, there was a reduction in the estimates for manufacturing and construction, activities that are more sensitive to the economic cycle and that declined more than expected in 2023Q1.

The projection for the tertiary sector grew from 1.0% to 1.6%, reflecting positive surprises in some activities. In general, activities in the services sector registered small changes in 2023Q1, as expected, but there were exceptions: "transportation, storage and mail" – possibly influenced by the flow of the harvest of soybeans – and "financial, insurance, and related services" grew strongly, and the resulting statistical carry-over prompts increases in the annual growth projections for these sectors. There was also an increase in the projection for commerce, whose change in 2023Q1, albeit modest, was also higher than forecasted, possibly benefited by the increase in agriculture and livestock. In the opposite direction, the estimate for "information services" was reduced, reflecting the activity downturn in early 2023. Growth projections for the other activities in the services sector were marginally revised.

Regarding the domestic components of aggregate demand, the projection for household consumption increased slightly from 1.5% to 1.6%. For government consumption, the projection rose from 0.7% to 1.0%, and for Gross Fixed Capital Formation, changed from stability to a 1.8% decline. The changes stem from surprises in the 2023Q1 result and the incorporation in the projections of the first coincident indicators for 2023Q2.

Exports and imports in 2023 are expected to vary by 3.7% and 0.0%, versus projections of 2.4% and -0.5%, respectively. The higher estimates reflect higher-than-anticipated 2023Q1 results as well as 2023Q2 exports and imports data for goods and services available by the cut-off date of this IR. Considering the new estimates for the components of aggregate demand, the contributions of the domestic demand and the external sector to the evolution of the 2023 GDP are estimated at 1.3 p.p. and 0.7 p.p., respectively.

Risk factors for this projection originate domestically and externally. Regarding the domestic scenario, the previous IR mentioned a possible deceleration in the supply of credit greater than would be compatible with the current stage of the monetary policy cycle as a risk to 2023 growth. Even though this risk remains, a box of this IR[3] suggests that credit granting with non-earmarked resources has evolved in line with expectations. Also contributing to risk reduction is the progress in the definition of the new fiscal regime, which has reduced the uncertainty associated with extreme scenarios of public debt growth. Among the possible risks for global growth, which may have consequences for the Brazilian economy, the following stand out: i) the persistence of inflationary pressures in major economies, which may require a more lasting monetary tightening, with effects on economic activity; ii) the pace of reopening and recovery of the Chinese economy and the risks arising from adjustments in the country's real estate sector; and iii) the consequences of recent episodes involving banks abroad, despite the limited contagion on financial conditions so far.

2/ The share of thermal power plants in total energy produced in 2023Q1 was the lowest for the period since 2011. Since thermal power plants use more inputs for energy production than hydroelectric, wind, and photovoltaic plants, their lower share leads to an increase in GVA per amount of energy produced.

3/ See box "Cycles of credit granting with non-earmarked resources and of economic activity" of this IR.

Cycles of credit granting with non-earmarked resources and of economic activity

Credit granting with non-earmarked resources has decelerated since late 2022, especially in the corporate segment. A lower dynamism in the credit market was already expected in view of the degree of monetary policy tightening. However, in 2023, relevant events in Brazil and abroad potentially bring additional deterioration to the credit market, of uncertain magnitude. In this context, it becomes especially relevant to assess the extent to which the evolution of credit is in line with what would be the usual given the cyclical conditions of the economy.

This box analyzes the behavior of bank credit granting in light of the monetary policy and economic activity cycles, through the following specification:

$$y_t = c + \beta h_t + \delta r_t + \varepsilon_t, \text{ where}$$

y_t: cyclical component of the logarithm of the non-earmarked credit granting (household or corporate) – deflated and seasonally adjusted;

h_t: output gap (contemporaneous or lagged);

r_t: ex-ante real interest rate gap (contemporaneous or lagged).

The estimation sample considered quarterly data from 2003 to 2019. The exclusion of the period 2020Q1-2023Q1 is both to avoid the influence of the Covid-19 pandemic period and to ensure that the model adjustment does not depend on the period to be evaluated.[1] The granting series used in this exercise (Figures 1 and 2) consider the aggregation of the non-earmarked credit types available both in the current statistics of credit granting (series started in 2011) and in the old ones (from June 2000 to December 2012).[2] This matching aims to extend the sample so that it contains a larger number of business cycles.[3]

Figure 1 – New loans – Non-Earmarked Corporate

BRL billion in Mar 23, s.a., 2000Q3 = 100

Credit types: discount of receivables, working capital, vendor, vehicles and other goods financing, guaranteed overdraft accounts, ACC, and foreign on-lendings.

Figure 2 – New loans – Non-Earmarked Household

BRL billion in Mar 23, s.a., 2000Q3 = 100

Credit types: personal credit, vehicles and other goods financing, and overdraft facilities.

1/ However, it is worth noting that the cyclical components of the dependent and explanatory variables are estimated on the basis of the entire sample.

2/ The selected types are: i) in non-earmarked household, other goods financing, vehicles financing, overdraft, and personal credit; ii) in non-earmarked corporate, other goods financing, guaranteed account and overdraft, discount of trade bills and receivables, working capital, compror and vendor, advances on exchange contracts, and foreign on-lending. For further information, see box Selic rate pass-through to the bank credit market, of the September 2022 IR. In April 2023, the selected credit types correspond to 81% of non-earmarked household credit balance, excluding credit card, and 85% of non-earmarked corporate credit balance.

3/ The importance of a larger sample size for the proper estimation of equations restricts the analysis to non-earmarked bank credit.

The cyclical component of the logarithm of the granting was estimated by using the HP filter (Figures 3 and 4). The gap of the real interest rate is the difference between the ex-ante real interest rate[4] and the neutral real interest rate, which, like the output gap, is extracted from the small-scale aggregate model.[5] The equation was estimated by ordinary least squares (OLS) and the reported standard errors are robust to heteroscedasticity and autocorrelation (HAC). The lag of the regressors was determined by comparing the models using the Akaike's information criterion. For non-earmarked household and non-earmarked corporate credit, the contemporaneous relation and the one-quarter lagged relation, respectively, were selected.

Figure 3 – New loans cycle – Non-Earmarked Corporate

% deviation from the trend

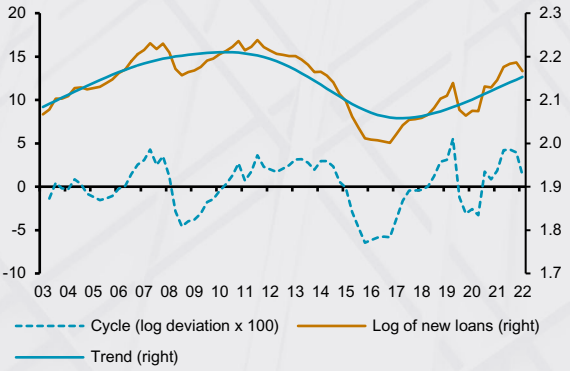
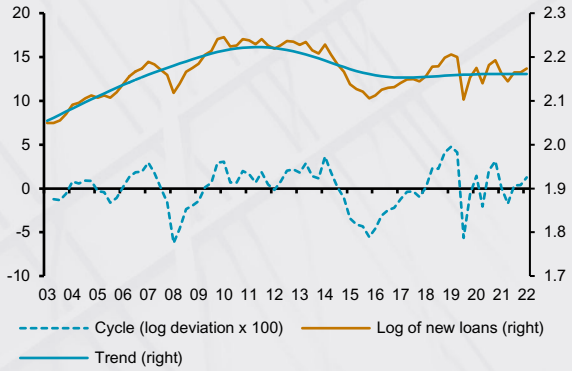


Figure 4 – New loans cycle – Non-Earmarked Household

log scale



The estimation results, with the standard errors in parentheses underneath the point estimates of the coefficients, are as follows:

$$\text{Corporate: } y_t = \underset{(0,43)}{0,34} + \underset{(0,24)}{1,26}h_{t-1} - \underset{(0,19)}{0,28}r_{t-1}\text{ , } R^2 = 0,64$$

$$\text{Household: } y_t = \underset{(0,40)}{0,38} + \underset{(0,23)}{0,76}h_t - \underset{(0,21)}{0,33}r_t\text{ , } R^2 = 0.41$$

The estimated coefficients should not be given in a structural or causal interpretation[6], but they have the expected sign: the credit cycle has a positive association with the economic activity cycle and a negative association with the interest rate cycle. The model fit to data is also satisfactory, considering that the model is parsimonious.

After the estimation of models, conditional forecasts were made for the entire sample, including for the period from 2020 and 2023Q1. The predicted values reflect what would be expected from the cyclical credit component, given the output gap and the monetary policy stance – and disregarding lagged values of credit itself. Thus, the comparison between predicted and actual values helps answering the question of whether credit is evolving in line with expectations. Figures 5 and 6 compare actual data with the predicted values for corporate and household credit, respectively, including the prediction ranges associated with deviations of one or two standard deviations from the central forecast.

4/ Calculation based on the four-quarter ahead Selic rate, discounted from inflation expectations for the same period, both extracted from the Focus survey.

5/ For further details, see section 2.2 of this IR, and box Revision of the small-scale aggregate model, from the December 2021 IR.

6/ For example, one might think that there are cyclical structural relationships in which, simultaneously: (i) activity depends positively on credit and negatively on interest; (ii) credit depends positively on activity and negatively on interest; and (iii) interest depends positively on activity and credit. The estimated equation can be thought of as a reduced form with coefficients that combine all these effects, without causal interpretation. The lack of causal interpretation is not a problem for this exercise because the answer to the question of interest is related to the conditional expectation *E* [credit|(activity, interest rates)], which is linearly approximated by the exercise.

Figure 5 – New loans cycle – Non-Earmarked Corporate

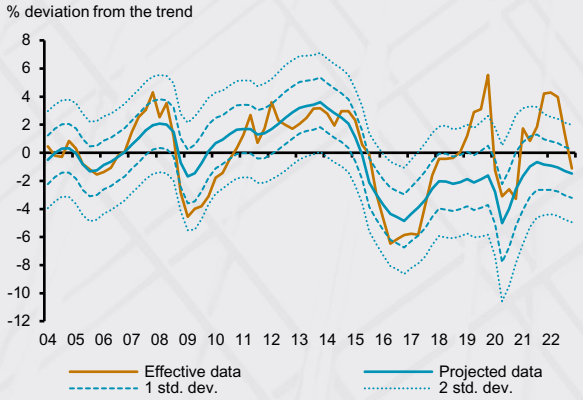
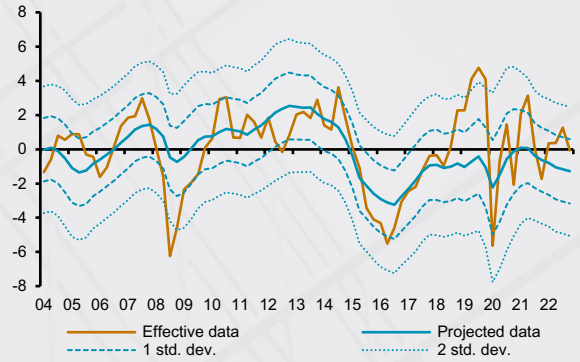


Figure 6 – New loans cycle – Non-Earmarked Household



In 2023Q1, cyclical components of the non-earmarked household and corporate credit were in line with the models' predictions. In the case of household credit, actual values have been relatively in line with the model's predictions since 2020. However, in the case of corporate credit, this alignment only happened after a strong decline, since granting was above the range of two standard deviations around the predicted value from 2022Q1 to 2022Q3.[7] The decline towards the normalization of the credit cycle started in 2023Q4, therefore before the event involving *Americanas*.[8]

It is interesting to note which were the previous episodes when a more significant mismatch occurred between the actual behavior of the credit cycle and that predicted by the models . The first episode was the one immediately following the outbreak of the 2008 global financial crisis and, in that episode, possibly in view of the very nature of the crisis, credit contraction was much higher than predicted. The second episode occurred between late 2019 and early 2020, but in the opposite direction: the cyclical dynamics of credit proved to be significantly stronger than predicted. It is worth highlighting that the outbreak of the Covid-19 pandemic led to strong economic activity contraction, but that several measures were adopted to boost the credit market – including non-earmarked credit granting. In the case of corporate credit, it is also worth recalling the strong rise of credit granting in March 2020, especially in the second fortnight of the month – with emphasis on working capital, discount of receivables, and export financing –, suggesting a precautionary behavior of companies, which possibly chose to strengthen their cash reserves.[9]

Alternative specifications regarding the lags of the explanatory variables were tested and are available in the appendix. Even though the point estimates of the coefficients vary, the conclusions do not change substantially. In short, the cyclical component of credit granting in recent quarters seems consistent with what would be expected, given the current stage of the economic and monetary cycles.[10]

7/ The first half of 2022 is a period when, on the one hand, economic growth was higher than expected, but, on the other hand, bank interest rates already reflected the monetary tightening underway since the previous year. While the first factor could stimulate companies' demand for credit, the second should contribute to reduce it.

8/ *Americanas* is a large Brazilian retail company that filed for judicial reorganization in January 19, 2023.

9/ See box Credit market outlook of the June 2020 IR

10/ It was also considered an exercise in which the analysis is extended to 2023Q2, by extrapolating for 2023Q2 the actual and seasonally adjusted real volume of granting observed in April (statistical carry-over). This exercise suggests that in 2023Q2 the cyclical components of both household and corporate segments would be below the central value predicted by the respective models, but still within the prediction range of two standard deviations. Overall, but with greater uncertainty, the conclusion obtained for 2023Q1 would hold.

Appendix

M1 to M4 models encompass different combinations in the choice of lags for the output gap and for the ex-ante real interest rate.

Table 1 – Estimated models

Dependent variable – Cycle of non-earmarked new loans

Selected models highlighted in bold font

	Corporations				Households			
	M1	M2	M3	**M4**	**M1**	M2	M3	M4
c	0,26	0,33	0,27	0,34	0,38	0,39	0,40	0,42
	(0,44)	(0,41)	(0,46)	(0,43)	(0,40)	(0,42)	(0,40)	(0,39)
h_t	1,23***		1,20***		0,76***		0,69***	
	(0,26)		(0,28)		(0,23)		(0,25)	
h_{t-1}		1,31***		1,26***		0,67***		0,59**
		(0,23)		(0,24)		(0,21)		(0,23)
r_t	-0,15	-0,27			-0,33	-0,41**		
	(0,21)	(0,18)			(0,21)	(0,20)		
r_{t-1}			-0,16	-0,28			-0,35	-0,45**
			(0,23)	(0,19)			(0,21)	(0,21)
R^2	0.57	0.64	0.57	0.64	0.41	0.35	0.41	0.36
AIC	-5.092	-5.260	-5.077	-5.264	-5.126	-5.013	-5.111	-5.033

Obs: for the ease of the reader, coefficients multiplied by 100. Numbers in-between parentheses refer to standard deviations of point estimates.

***, significant at 1%; **, significant at 5%; *, significant at 10%.

Projection for credit growth in 2023

Credit market data released since the March 2023 IR show a higher-than-expected growth in the balance of household credit, mainly in the earmarked segment, whereas the corporate financing dropped more strongly, mostly in the non-earmarked segment. With the incorporation of these data and the revision of the prospective macroeconomic scenario, the projected growth of nominal credit balance rose from 7.6%, in the previous IR, to 7.7% (Table 1).

For 2023, the growth projected for the non-earmarked household credit balance rose from 8.0% to 9.0%, reflecting the increased resilience observed in credit granting until April 2023. The growth projection for earmarked corporate credit, in turn, was reduced from 6.0% to 3.0%, due to the sharper-than-expected deceleration in the first four months of the year. This movement partially reflects the relatively restrictive credit supply in early 2023[1], as a consequence of both the general economic outlook, including the current stage of the monetary cycle, and the unfolding of the *Americanas* situation.[2]

In the earmarked segment, the projected growth in the balance of household credit rose from 9.0% to 11.0%, driven by the greater availability of rural credit in early 2023. The revision also reflects the still mild deceleration in the balance of real estate credit, despite the reduced credit granting observed since mid-2021. It is worth mentioning that, since maturities of this modality are high and amortizations relatively small in comparison with balances, movements in the volume of credit granting have a more lagged impact on the credit portfolio. Finally, in the corporate segment, the growth projection was maintained at 7.0%.

In short, revised projections of nominal credit balance growth for 2023, although slightly higher than in the March 2023 IR, continue indicating deceleration in the pace of credit growth, especially in the non-earmarked segment, consistent with the monetary tightening cycle (Figure 1).

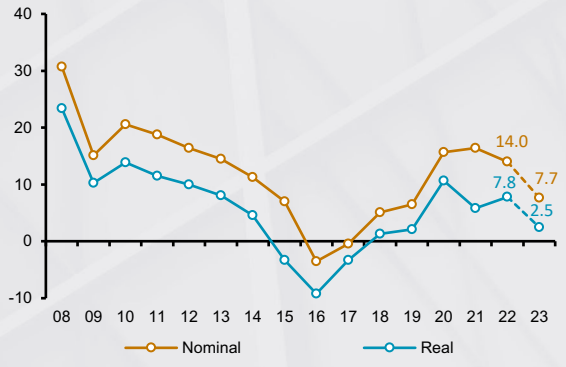
Table 1 – Credit balance

12-month % change

	Occurred			Proj. 2023	
	2021	2022	Apr 2023	Previous	Current
Total	16.4	14.0	11.1	7.6	7.7
Non-earmarked	20.4	14.1	8.8	7.1	6.3
Households	23.0	17.5	13.9	8.0	9.0
Corporations	17.4	10.1	2.7	6.0	3.0
Earmarked	10.9	14.0	14.7	8.3	9.6
Households	18.5	18.0	18.1	9.0	11.0
Corporations	-0.1	6.9	8.5	7.0	7.0
Total Households	21.0	17.7	15.7	8.4	9.9
Total Corporations	10.6	9.0	4.6	6.3	4.4

Figure 1 – Total credit outstanding

% year change



1/ According to the Quarterly Survey of Credit Conditions (PTC), whose data are available in the BCB's Time Series Management System (SGS), in the section "Credit indicators" and subsection "Quarterly survey of credit conditions".

2/ *Americanas* is a large Brazilian retail company that requested judicial reorganization in January 19, 2023. Further details available in the Section "1.2.2 Credit" of the May 2023 Financial Stability Report.

Projections for the external accounts in 2023

The projection for the current account deficit in 2023 was revised from USD 32 billion in the March 2023 IR to USD 45 billion, corresponding to 2.2% of GDP. The increased deficit projection is mostly due to the reduction in the trade balance, from USD 62 billion to USD 54 billion, reflecting reduced exports and increased imports.

The projected exports value in the year results from a sharper decline in the implicit prices than previously expected, following the trajectory of commodity prices in international markets. This reduction in relation to 2022, already forecasted in the previous IR, is expected to occur in greater intensity, mainly for primary goods such as soybeans and oil. The expansion in the volume of exports associated with the record grain harvest expected for the year – positively revised since the March 2023 IR – should only partially offset the negative revision of prices. This projection also incorporates a larger-than-expected volume of exports of manufactured and semi-manufactured goods.

Table 1 – Projections for the external accounts

USD billion

Itemization	2022	2023	2023 Forecast	
	Year	Jan - Apr	Previous	Current
Current account	-57	-14	-32	-45
Balance on goods	44	19	62	54
Exports	340	105	338	335
Imports	296	86	277	281
Services	-40	-10	-36	-36
of which: Travel	-7	-2	-11	-11
of which: Transportation	-19	-4	-14	-14
Primary income	-65	-23	-61	-63
of which: Interests	-19	-9	-25	-25
of which: Dividends	-46	-14	-36	-38
Investment - liabilities	124	31	70	75
DI liabilities	92	24	75	75
Portfolio investments	-4	4	-5	0
Other investments[1]	37	3	0	0

1/ includes loans, commercial credits, deposits, and other investments

As for imports, smaller declines than projected in the previous IR are expected for prices and quantum. The revision reflects more recent data, which show a slight recovery of imports in the main categories. Particularly noteworthy are the international purchases of capital and intermediate goods, whose downward trends, which coincided with the normalization of global supply chains, have been at least temporarily interrupted.

The expected deficit in the services account was maintained at USD 36 billion, below that of 2022. The projections for the travel and transportation accounts were also maintained. The expectation of a lower deficit compared with the previous year reflects lower transportation expenses resulting from the gradual normalization of air and waterway transportation costs, in addition to the lower volume of imported goods. Conversely, travel expenses are expected to exceed those of 2022, already at a level more consistent with the pre-pandemic period.

The projected deficit for the primary income account was revised slightly upward, as a result of larger net income expenses. These expenses continue at a high level, although lower than in 2022, reflecting favorable results of companies with equity participation of non-residents in 2023Q1, when economic activity surprised, especially in the less cyclical sectors. The projection for net interest expenses, which reflects the prospects of expansion in comparison with 2022 due to the highest levels of policy interest rates in major economies, was maintained.

Figure 1 – Current account

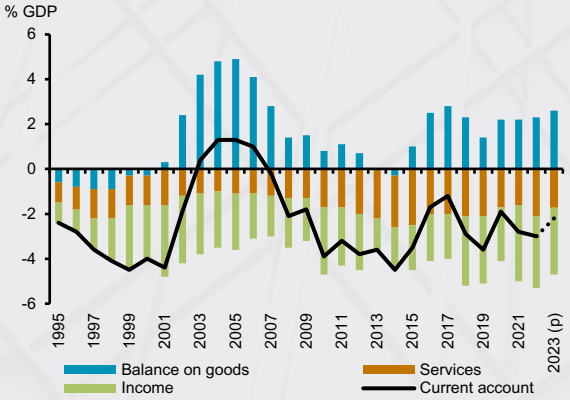
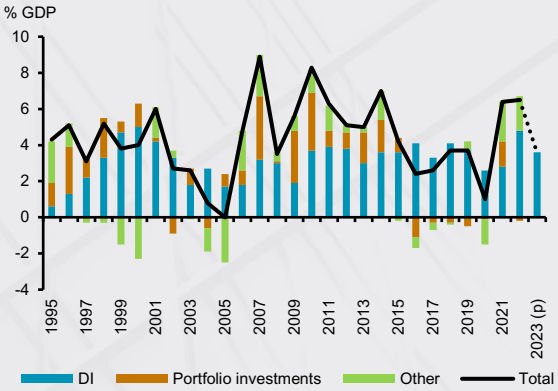


Figure 2 – Investment – liabilities



In the financial account, the projection for net inflows of direct investment liabilities was maintained at USD 75 billion (3.6% of GDP), continuing at a higher level than the current account deficit projection. Despite the robust figures observed in early 2023, similar to those of 2022 that secured the highest mark in 10 years, more recent data signal moderation. In addition to lower inflows of intercompany debt transactions, which weaken as their financing cost in foreign currency increases, declining net inflows of direct investment liabilities are expected to result from lower reinvestment of earnings over the year. Nonetheless, the resumption of investments postponed due to the pandemic as well as investment opportunities in sectors such as energy, technology, and infrastructure should guarantee a result closer to the average observed in the decade prior to the pandemic, in terms of percentage of GDP.

The projection for portfolio investments was revised from net outflows of USD 5 billion to neutrality. In addition to the positive balance observed until April 2023, especially in the segment of securities traded in the country, the slight revision over the previous IR reflects an improved balance of risks, with lower fiscal uncertainty and lower country-risk measured by the Credit Default Swap (CDS) of sovereign securities. Moreover, the decline in outstanding securities abroad limits the space for net amortizations, whereas the external environment has become more favorable to new issuances, past the heightened concerns about the banking sector in major economies.

Inflation outlook

2

This chapter analyzes the inflation outlook up to 2025, therefore covering all years for which the National Monetary Council (CMN) sets inflation targets, considering the cut-off date of this document.

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

Inflation projections are conditional on a set of variables. In particular, the scenarios use 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 (PPP) theory.[41]

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. Projections are presented together with probability intervals that highlight the degree of uncertainty involved.

In this IR, projections use data available up to the 255th Copom Meeting, held on June 20-21, 2023. As for the conditioning factors used in the projections, especially those from the Focus survey, the cut-off date is June 16, 2023, unless otherwise stated.

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

2.1 Revisions and short-term projections

Consumer inflation, measured by the IPCA, surprised downward in the Mar-May quarter, turning out to be 0.23 p.p. below the level expected by Copom in the March reference scenario (Table 2.1.1). In addition to the surprise with the released results, the inflation projection for June was revised in the same direction, from 0.29% in the previous IR, to -0.08% in this IR.[42]

In relation to the Copom's reference scenario, the downward surprise in the period was mainly due to the food-at-home segment and to the ex-underlying component of services inflation. In the food-at-home segment, the surprise was widespread across processed, fresh, and semi-processed foods, highlighting lower-than-expected prices for meat, tubers, roots and vegetables, and fruits. In the ex-underlying services component, the surprise is explained by lower price variations in airline tickets, a volatile item, and in communication services. The underlying component of services also showed lower than expected variations, but with a smaller deviation. Conversely, inflation of administered prices was higher than expected. The surprise was concentrated in May, mainly reflecting the adjustments in city bus fares, energy, and games of chance, with a relevant contribution from the variation in gasoline prices.

Prospectively, in the Copom's reference scenario, short-term projections consider changes of -0.08% in June, 0.29% in July, 0.25% in August, and 0.26% in September (Table 2.1.2).

The revision in the June projection in relation to the previous IR is concentrated in the food-at-home segment and, mainly, in industrial goods, which incorporates the effects of the Provisional Measure (MP) 1,175, of June 5, 2023. MP 1,175 provides for a sponsored discount mechanism for the purchase of vehicles, which should result in a drop in automobile prices in June, with a partial reversal of this effect in the following months.

Table 2.1.1 – Inflation surprise

% change

	2023				
	Mar	Apr	May	Quarterly	12-month up to May
Copom scenario[1/]	0.87	0.63	0.28	1.79	4.17
Actual IPCA	0.71	0.61	0.23	1.56	3.94
Surprise	-0.16	-0.02	-0.05	-0.23	-0.24

Sources: IBGE and BCB

1/ Scenario at the March 2023 IR cut-off date.

Table 2.1.2 – Short-term projection[1/]

% change

	2023			
	Jun	Jul	Aug	Sep
Monthly change	-0.08	0.29	0.25	0.26
Quarterly change	0.76	0.44	0.46	0.80
12 months change	3.16	4.17	4.81	5.38

Sources: IBGE and BCB

1/ Scenario at cut-off date.

42/ Inflation released in the Mar-May quarter was also below that expected by market analysts, and the median expectation for the June inflation is lower than that observed in the cut-off date of the previous IR. The median inflation accumulated in March, April, and May projected by Focus participants on March 17, 2023, was 1.77%. The 10th and 90th percentiles of the distribution were 1.54% and 2.00%, respectively. The Focus median inflation projection for June was 0.36% on March 17, 2023, and declined to -0.04% in the cut-off date of this IR.

The reference scenario until September predicts low changes in food prices, in line with favorable seasonality and the benign evolution of wholesale prices of agricultural and livestock products. Among the administered products, gasoline prices should be pressured by another round of the reinstatement of federal taxes in early July. This tends to be partially offset by the dissipation of the increases observed in the previous quarter in the prices of pharmaceutical products, lotteries, and water and sewage tariffs. Smaller changes are also expected in health insurance, in view of the announcement by the National Supplementary Health Agency (ANS) of a maximum limit for adjustment of individual and family regulated plans lower than that authorized in the previous year.

The evolution of industrial goods prices should be strongly influenced by the effects of MP 1,175. Nevertheless, these effects are uncertain, both in relation to the impact in June and to the magnitude of its reversal after the end of the government-sponsored discounts. Generally speaking, except for the influence of MP 1,175, the reference scenario predicts the continuity of disinflation in the industrial goods segment, in line with the deceleration observed in producer prices. Finally, in the services segment, the underlying component should resume the disinflation process started in mid-2022, although slower than that expected for the industrial goods segment. The average of inflation cores is also expected to continue on a downward trajectory, but still above the inflation target.

In the reference scenario, the 12-month inflation drops from 3.94% in May to 3.16% in June, a figure that still reflects the effect of the tax exemptions implemented in 2022. Starting in July, the influence of these tax exemptions diminishes and the 12-month inflation gradually increases, reaching 5.38% in September.

2.2 Conditional projections

Conditioning factors

Figure 2.2.1 – Exchange rate assumptions for projections – PPP trajectory

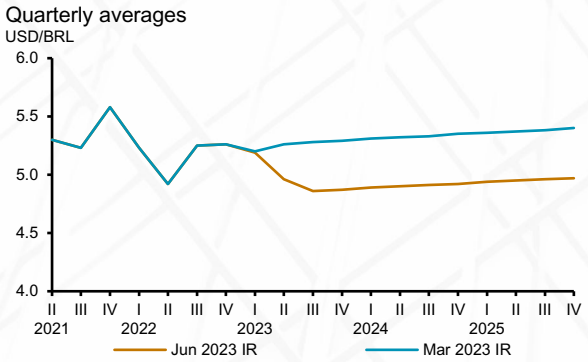
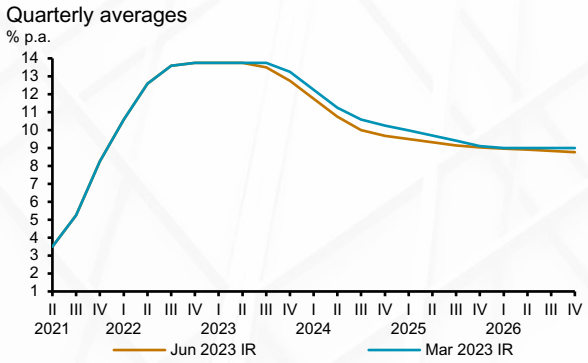


Figure 2.2.2 – Selic rate target assumptions for projections – Focus survey expectations



The considered inflation scenarios are built using several conditioning factors. The exchange rate starts at USD/BRL 4.85[43], with an appreciation of 7.6% against the value of USD/BRL 5.25 of the March 2023 IR, and follows a path according to the PPP[44] (Figure 2.2.1). Averages for the last quarters of 2023, 2024, and 2025 are USD/BRL 4.87, USD/BRL 4.92, and USD/BRL 4.97, respectively.

In the case of the Selic rate, the median expectations extracted from the Focus survey of June 16, 2023, indicated stability at 13.75% p.a. in the June 2023 meeting and the start of a downward trend in the August 2023 meeting, when it would decline to 13.50% (Figure 2.2.2). In this trajectory, the Selic rate for the end of 2023, 2024, 2025, and 2026 is 12.25%, 9.50%, 9.0%, and 8.75%, respectively.[45] In most cases, these values are lower than those indicated in the survey used in the previous IR, carried out on March 17, 2023, of 12.75%, 10.00%, 9.00%, and 9.00%, respectively.

The considered scenarios also have assumptions for several other conditioning factors. The current level of economic uncertainty is expected to decrease over time. From the fiscal point of view, it is supposed that the central government primary balance corrected by the economic cycle and by outliers, in the 12-month period, declines strongly throughout 2023 and then starts a partial recovery. The neutral real interest rate assumed in the projections is 4.5% p.a. over the relevant horizon, above that assumed in the previous IR, of 4.0% p.a.[46] The scenarios also incorporate the occurrence of the *El Niño* phenomenon. In terms of electricity flag rates, the green flag is assumed for December 2023, 2024, and 2025.

Regarding the oil price used in the projections, the assumed value is that around the average of prices

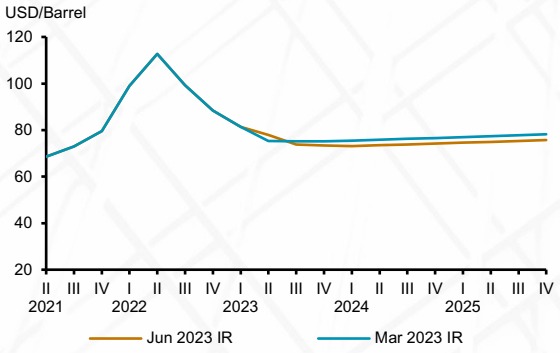
43/ Value obtained by the usual procedure of rounding the average USD/BRL exchange rate observed on the five business days ending on the last day of the week before the Copom meeting.

44/ For 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.

45/ As described in the box "Revision of the small-scale aggregate model" of the December 2021 IR, the Selic rate used in the IS curve refers to the Selic rate path one year ahead. Therefore, the interest rate over 2025 also depends on the Selic path over 2026. 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 values of each year's end.

46/ For several estimates of the neutral rate, see box "Measures of neutral real interest rate in Brazil", of this IR.

Figure 2.2.3 – Brent oil price
Quarterly averages



Sources: Bloomberg and BCB

effective during the week before the Copom's meeting. The assumption is that oil prices follow approximately the futures market curve for the following six months, reaching some USD 73/barrel, and then start increasing 2% per year onwards (Figure 2.2.3). Oil price has oscillated strongly since the previous IR. After reaching a trough in the cut-off date of the March 2023 IR, oil price rose until mid-April and then fell again. When compared with the previous IR, the average oil price assumed for 2023Q3 is 1.7% lower. Conversely, it should be highlighted that the reference scenario still considers the complete reinstatement of federal taxes on gasoline and ethanol in July 2023.[47]

Projections evaluated by Copom depend on assessments about the evolution of fiscal and parafiscal policies and their institutional framework, reforms, and necessary adjustments in the economy. Their effects on projections are captured through asset prices, the degree 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 impulses over the aggregate demand.

Inflation determinants

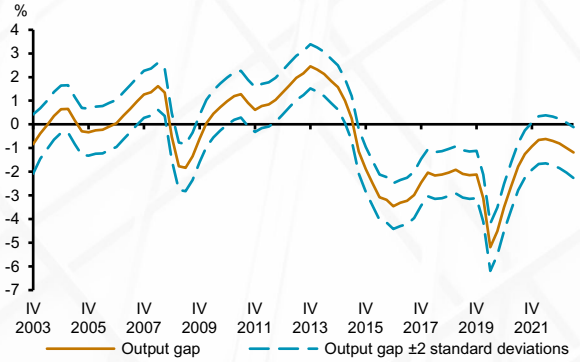
Commodity prices, in general, have oscillated since the cut-off date of the previous IR. When comparing the 2023Q2 and 2023Q1 averages, the IC-Br measured in USD declines 2.1%, reflecting the metal and energy segments. In this comparison, the changes in the agriculture and livestock, metal, and energy segments reached 0.0%, -4.6%, and -7.8%, respectively. The monetary policy tightening in major economies and the perspective of global economic deceleration have been acting as an important limiting factor for commodity prices.

The output gap – an unobservable variable whose measurement is subject to high uncertainty – is measured by the BCB using different methodologies. This chapter presents the estimated output gap according to the small-scale aggregate model.[48] In this estimation, the output gap is an unobservable variable whose trajectory incorporates information from four economic activity variables referring to the

47/ See Section 2.1 of this Chapter.
48/ See box "Revision of the small-scale aggregate model", of the December 2021 IR.

economy output and the slack of production factors. Specifically, the estimation uses the GDP, the Nuci (calculated by the FGV), the unemployment rate (measured by the IBGE), and the stock of formal jobs (measured by New Caged of the Ministry of Labor and Employment – MLE).[49] 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.

Figure 2.2.4 – Output gap estimates



Note: Figure data: 2003Q4–2023Q2.

Using this methodology, the estimated output gap, which had been following a narrowing trajectory, began to widen in the second half of 2022 (Figure 2.2.4). The output gap is estimated at -1.0% and -1.2% in 2023Q1 and 2023Q2, respectively[50], against the values of -1.3% and -1.5% used in the previous IR. Stronger-than-expected activity indicators, especially regarding the 2023Q1 GDP, and the revision of short-term projections of those indicators contributed to a narrower output gap estimated by the model. It is noteworthy that, due to high uncertainties involving output gap estimates, Copom evaluates projections with different estimates and scenarios for this variable.

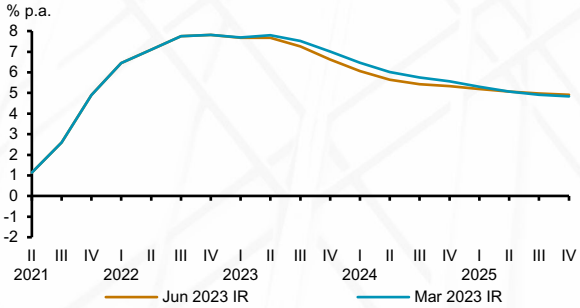
The seasonally adjusted GDP rose 1.9% in 2023Q1, compared with the previous quarter, against a decline of 0.1% in 2022Q4. GDP growth mainly reflected the strong expansion of the agriculture and livestock sector. Considering the gross added value excluding agriculture and livestock, GDP growth in 2023Q1 was 0.1%.[51] In view of the positive surprise in 2023Q1, GDP growth projection for the year rose from 1.2% to 2.0%.[52] The labor market has shown some resilience, with heterogeneous signs over the last months, after decelerating throughout the second half of 2022. The unemployment rate, measured by the PNAD-C, dropped again, but the employment level and the participation rate have shown a downward trend. When considering formal jobs measured by New Caged, net hirings registered strong figures, after declining in late 2022. Similarly, the Nuci, which had reached the highest values since 2014 in 2022Q3 and then started a downward trajectory, rose slightly over the last months.

The projected output gap for 2023Q4 is -1.5%, therefore, wider than estimated for 2023Q2, but

49/ Seasonally adjusted series are used.
50/ For 2023Q2, projections of these activity variables were used when data were not available.
51/ See Section 1.2 of this Chapter.
52/ See box "Projections for the GDP evolution in 2023", of this IR.

narrower than projected in the previous IR, -1.7%. After this period, the output gap starts a narrowing trend. The main factor explaining this trajectory is the Selic rate path (total increase of 11.75 p.p. since the March 2021 meeting until the August 2022 meeting) and its future trajectory taken from the Focus survey.

Figure 2.2.5 – Four-quarter-ahead real Selic
Quarterly averages

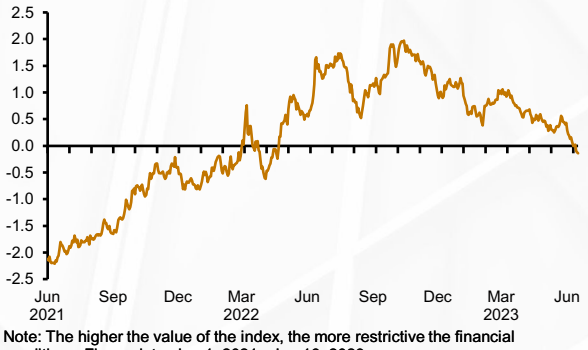


Note: Real Selic calculated as the four-quarter-ahead Selic rate, discounted from inflation expectations for the same period, both variables extracted from the Focus survey.

Compared with the previous IR, the four-quarter-ahead Selic rate discounted from inflation expectations for the same period, both variables extracted from the Focus survey and measured in terms of quarterly averages, fell in the horizon up to early 2025 (Figure 2.2.5). These values reflect the decline in the nominal Selic trajectory (Figure 2.2.2) to a greater extent than the reduction in inflation expectations. According to this metric, after reaching the trough of -1.3% in 2020Q4, the real interest rate entered a rapidly ascending trajectory, reaching a peak of 7.8% in 2022Q4. The rate declines slightly in the first half of 2023, further intensifying in the following quarters. It declines to 6.6% at the end of 2023, to 5.3% at the end of 2024, and to 4.9% at the end of 2025, still above the assumed neutral rate of 4.5%.

Uncertainty increased slightly in March and dropped in April and May, reaching a level similar to that of February, according to the FGV's Brazilian Economy Uncertainty Index – Brazil (IIE-Br). The behavior of uncertainty should depend on both external variables, such as volatility in international markets, and domestic variables, such as the trajectory of fiscal variables.

Figure 2.2.6 – Financial Conditions Index
Standard deviations from the mean – daily series



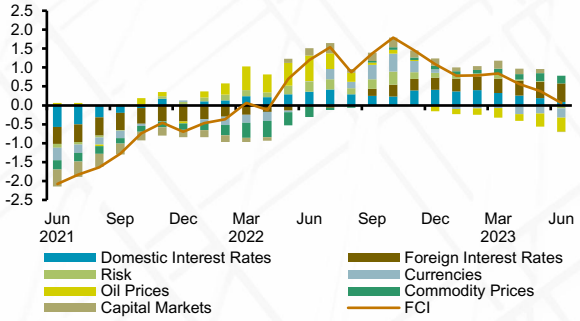
Note: The higher the value of the index, the more restrictive the financial conditions. Figure data: Jun 1, 2021 - Jun 16, 2023.

Financial conditions have oscillated since the previous IR, as measured by the BCB's Financial Conditions Index (FCI) (Figures 2.2.6 and 2.2.7).[53] After reaching a local peak in October 2022, the FCI fell in the following three months, rose slightly in February and March, but fell again in April, May, and June (average value until June 16). According to this metric, financial conditions have reached the less restrictive level since April 2022. Less restrictive financial conditions from March to June reflected external and, mainly, domestic[54] factors, highlighting the BRL appreciation, the declines in futures interest rates in Brazil, the Chicago Board Option Exchange Volatility Index (VIX), the country-risk premium, and

53/ 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.

54/ For the FCI decomposition into domestic and external factors, see box "Decomposition of the Financial Conditions Index into domestic and external factors", of the December 2022 Inflation Report.

Figure 2.2.7 – 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. Jun/2023 value refers to the average until the 16th.

the oil prices, coupled with the rise in the domestic and foreign stock exchanges. Conversely, factors contributing to more restrictive financial conditions in the period were the increase of futures interest rates in advanced economies and the decline in the prices of metal commodities. 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 this indicator with inflation is ambiguous, because some of its components, such as those related to the risk premium and the exchange rate, are in general positively related to inflation and negatively related to activity. Therefore, tighter financial conditions indicate lower expected economic activity, but may imply either higher or lower inflation, depending on the factors that condition its movement.

The median inflation expectation collected by the Focus survey, when compared with the previous IR, fell in all years, unlike what was observed in the previous IR. For 2023, the median dropped from 5.95% to 5.12%; for 2024, from 4.11% to 4.00%; and, for 2025, from 3.90% to 3.80%.

Inflation projections

Projections in this IR represent the Copom's view and resulted from the combination of the following elements: i. experts' analysis of context and projections for market prices in shorter horizons and for administered prices up to a certain horizon; ii. use of studies and macroeconomic models, satellite models, and specific models for administered price items; iii. building of trajectories and assumptions for the conditioning variables; and iv. assessment on the state and prospects of the economy.[55]

In the reference scenario, which uses the oil price trajectory following approximately the futures curve for the next six months, the Selic rate of the Focus survey, and the exchange rate following the PPP, four-quarter inflation oscillates throughout 2023, depending on the inclusion or not, in the period, of the effects of the tax exemption on fuels, concentrated in 2022Q3, and the reinstatement of taxes on gasoline and ethanol, part occurred in 2023Q1 and part to be effective in 2023Q3. One of the results is the sharp increase in the projection for the 12-month inflation between 2023Q2 and 2023Q3, with the exclusion

Table 2.2.1 – Inflation projections – Scenario with Selic from Focus survey and PPP exchange rate
Year-on-year IPCA inflation

%

Year	Qtr	Target	March IR	June IR	Difference (p.p.)
2023	II		3.8	3.2	-0.6
2023	III		6.0	5.4	-0.6
2023	IV	3.25	5.8	5.0	-0.8
2024	I		4.6	4.1	-0.5
2024	II		4.2	4.1	-0.1
2024	III		3.8	3.7	-0.1
2024	IV	3.00	3.6	3.4	-0.2
2025	I		3.4	3.2	-0.2
2025	II		3.3	3.1	-0.2
2025	III		3.2	3.0	-0.2
2025	IV	3.00	3.2	3.1	-0.1

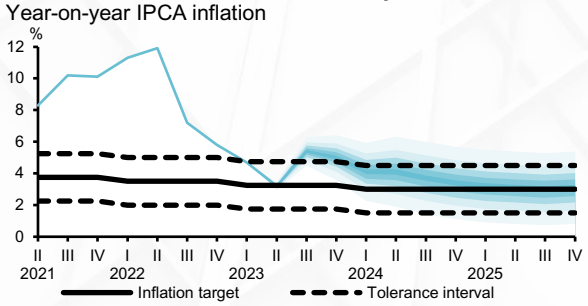
55/ See box "BCB's analysis and projection system", of the March 2023 IR.

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

%

Year	Qtr	50%	30%	10%	Central	10%	30%	50%
2023	II	3.1	3.1	3.2	3.2	3.2	3.3	3.3
2023	III	5.0	5.2	5.3	5.4	5.5	5.6	5.8
2023	IV	4.4	4.7	4.9	5.0	5.1	5.3	5.6
2024	I	3.4	3.7	4.0	4.1	4.2	4.5	4.9
2024	II	3.2	3.6	3.9	4.1	4.3	4.6	5.0
2024	III	2.8	3.2	3.5	3.7	3.9	4.2	4.6
2024	IV	2.5	2.9	3.2	3.4	3.6	3.9	4.3
2025	I	2.3	2.7	3.0	3.2	3.4	3.7	4.1
2025	II	2.2	2.6	2.9	3.1	3.3	3.6	4.0
2025	III	2.1	2.5	2.8	3.0	3.2	3.5	3.9
2025	IV	2.2	2.6	2.9	3.1	3.3	3.6	4.0

Figure 2.2.8 – 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
2023	1.75	0	4.75	61
2024	1.50	9	4.50	21
2025	1.50	12	4.50	16

Note: Numbers rounded to the nearest integer value.

Table 2.2.4 – Inflation projections of market and administered prices – Scenario with Selic from Focus
YoY IPCA inflation

%

Year	IPCA		Market prices		Administered prices	
	March IR	June IR	March IR	June IR	March IR	June IR
2023	5.8	5.0	4.3	3.7	10.2	9.0
2024	3.6	3.4	3.1	2.9	5.3	4.6
2025	3.2	3.1	3.1	2.9	3.6	3.4

Note: the values shown are rounded off. Therefore, aggregated values may not match the simple combination of rounded disaggregated values.

of 2022Q3. The 2023 inflation is projected at 5.0%, lower than in 2022, 5.8%, and above the upper limit of the tolerance range (4.75%) of the inflation target (3.25%). Projected inflation falls to 3.4% in 2024 and to 3.1% in 2025, against inflation targets of 3.00% for both years (Tables 2.2.1 and 2.2.2 and Figure 2.2.8).

In terms of the estimated probabilities that inflation exceeds the limits of the tolerance range (Table 2.2.3), it is noteworthy in the reference scenario the reduction in the probability of inflation exceeding the upper limit in 2023, which declined from nearly 83% in the previous IR to nearly 61% in this IR.

In comparison with the March 2023 IR, in the reference scenario, inflation projections fell for the entire horizon considered.

The key factors leading to the revision of the inflation projections are listed below.

Main upside factors:

- lower Selic rate trajectory in the Focus survey;
- stronger-than-expected economic activity indicators; and
- use of a higher neutral real interest rate than in the previous IR, with stronger effect for longer horizons.

Main downside factors:

- exchange rate appreciation;
- recent lower-than-expected realized inflation;
- revision of short-term projections;
- decline in the oil price;
- change in the electricity tariff flag considered for the end of 2023, from yellow to green;
- fall in inflation expectations; and
- behavior of the economic uncertainty, measured by the IIE-Br, at higher values than considered in the projections.

When the groups of market and administered prices are considered (Table 2.2.4), it is noticeable a decline in projections for both groups for all years considered. In the case of administered prices for 2023, it should be highlighted the BRL appreciation, impacting the oil price measured in domestic currency, and the change in the assumed electricity tariff flag.

In comparison with the inflation projections of the 254th Copom Meeting held in May, declines of 0.8

p.p. for 2023 and 0.2 p.p. for 2024 were observed (see the 254th Meeting Minutes). Key factors were basically the same indicated in the comparison with the previous IR projections.

2.3 Monetary policy conduct and balance of risks

The global environment remains challenging, albeit with some positive revisions on output growth for the year. Despite some attenuation on the stress involving banks in the US and Europe, the situation still requires monitoring. The central banks of major economies remain committed to bringing inflation back to its targets, even with resumption of the hiking cycles in some cases, in an environment where inflation has been resilient.

Regarding the domestic scenario, the most recent set of activity indicators remains consistent with the scenario of economic deceleration for the next quarters. The higher-than-expected growth in the first quarter was due to the strong performance of the agriculture and livestock sector. Notwithstanding the recent reduction of headline consumer inflation, an increase in the twelve-month headline inflation over the second half of the year is anticipated. Moreover, the various measures of underlying inflation are still above the range compatible with meeting the inflation target. Inflation expectations for 2023 and 2024 collected by the Focus survey are around 5.1% and 4.0%, respectively.

In its most recent meeting, the Committee emphasizes that its inflation scenarios encompass risk factors in both directions. Among the upside risks for the inflationary scenario and inflation expectations, it should be emphasized (i) a greater persistence of global inflationary pressures; (ii) some residual uncertainty about the final fiscal framework to be approved by the National Congress and, more relevant for monetary policy, its impacts on the expected paths of the public debt and of inflation expectations, and on risky assets; and (iii) a larger or more persistent deanchoring of long-term inflation expectations. Among the downside risks, it should be noted (i) an additional reduction in the prices of international commodities measured in local currency, even though a sizeable portion of this movement has already been observed; (ii) a greater

than projected deceleration of global economic activity, particularly due to adverse conditions in the global financial system; and (iii) a slowdown in domestic credit concession larger than what would be compatible with the current stance of monetary policy.

Considering the assessed scenarios, the balance of risks, and the broad array of available information, Copom decided to maintain the Selic rate at 13.75% p.a. and judges that this decision is consistent with the strategy for inflation convergence to around its target throughout the relevant horizon for monetary policy, which includes the year of 2024. Without compromising its fundamental objective of ensuring price stability, this decision also implies smoothing economic activity fluctuations and fostering full employment.

The current context, characterized by a stage in which the disinflationary process tends to be slower and in an environment of deanchored inflation expectations continues to require caution and parsimony. Copom reaffirms its commitment to set monetary policy to meet the targets and judges that the strategy of maintaining the Selic rate for a long period has been adequate to ensure the convergence of inflation. The Committee emphasizes that it will persist until the disinflation process consolidates and the expectations anchor around its targets. The Committee judges that the current scenario demands patience and serenity in the conduct of monetary policy and reminds that the future steps of monetary policy will depend on the inflationary dynamics, especially the components that are more sensitive to monetary policy and economic activity, on inflation expectations, in particular the longer-term ones, on its inflation projections, on the output gap, and on the balance of risks.

Measures of neutral real interest rate in Brazil

The economy's neutral real interest rate, a fundamental reference in the formulation of monetary policy, can be defined as the interest rate consistent, in the medium run, with inflation at the target and output growth equal to potential growth (Blinder, 1998). Thus, when the effective real interest rate is above the neutral rate, monetary policy is contractionary; when it is below, it is expansionary.

An inherent difficulty in using the neutral interest rate to guide monetary policy is that it is an unobservable variable. In addition, this rate varies over time in proportion to the evolution of its determinants, such as potential output growth rate; preferences of economic agents in terms of consumption, savings and investment; financial system efficiency; and the economy wide risk premium. Therefore, both the literature and the conduct of monetary policy consider a high degree of uncertainty to neutral interest rate estimates and prescribe that they be frequently reassessed. As an illustration of such uncertainty, this box presents several estimates of the neutral interest rate for the Brazilian economy[1], obtained by means of different methodologies, with the caveat that alternative approaches are present in the literature and may be considered by monetary authorities in their decision-making process. Therefore, this box is not an exhaustive analysis.

The inference on the neutral real interest rate combines, depending on the adopted methodology, the use of statistical filters and the support of economic theory at different levels. From this perspective, the methodologies presented in this box range from purely statistical approaches applied on ex-ante real interest rate measures to the analysis derived from Samba, the Banco Central do Brasil (BCB) DSGE model based on micro-foundations[2]. The use of filters seek to remove high frequency movements from the data – which are not related with the dynamics of an object driven by structural low frequency movements. On the other hand, the use of economic theory seeks to impose restrictions on the evolution of the neutral interest rate over time that are consistent with information observed for other variables in the economy. Obviously, different theoretical models result in different restrictions and, therefore, different neutral interest rate trajectories.

It should be stressed that the starting point of the statistical approaches explored in this box are the observations of medium and long run interest rates. Intuitively, current interest rates lower than those expected in longer time horizons stimulate the demand and supply of credit, for both consumption and investment. Thus, long-term interest rates tend to be a good approximation to the neutral rate, even though, in principle, amenable to further improvement by removing residual cyclical effects still reflected in long-term rates. Despite being potentially informational, one difficulty of directly using long-term market rates is the presence of risk premia, such as the premium for investment horizon risk or exchange rate risk in foreign currency instruments. To circumvent this problem, this box makes extensive use of the Focus survey, either for directly calculating estimates of expected medium-run real interest rates, or to assist in the removal of risk premia from market rates in different time horizons.

1/ This topic was also covered in four other boxes of previous IR: "Equilibrium real interest rate" (September 2010); "Evolution of the equilibrium real interest rate in Brazil" (September 2012); "Neutral interest rate and the conduct of monetary policy in Brazil" (September 2017); and "Proxy of the neutral interest rate implied by expectations from the Focus survey" (December 2019).

2/ Model described in Fasolo *et al.* (2023).

The following sections present the approaches adopted in the box, starting with the Focus survey expectations, moving to properly filtered market rates, and ending with structural models. The box also presents the most recent and the historical responses to the Pre-Copom Questionnaire (PCQ), in which the BCB with some frequency surveys neutral rate estimates from respondents in the same samples of the Focus survey.

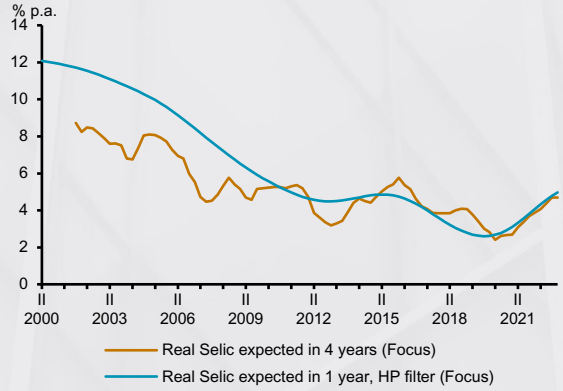
1. Description of methodologies and results

1.1. Focus survey *ex-ante* real interest rate

This estimate is based on *ex-ante* real interest rates extracted from the Focus survey. With this in mind, the box considers the median of the distribution of nominal interest rates forecasts by respondents for both the short (1 year) and medium term (4 years). Next, the median of expected nominal interest rates are deflated by the median of expected inflation in each time horizon, thus obtaining the ex-ante real interest rates R_t^{focus1} and R_t^{focus4}, for 1 and 4 years, respectively.

As argued in the introduction, long-term interest rates free of risk premia tend to be good estimates for the neutral rate. Thus, the first estimate for the neutral real interest rate to be considered is the ex-ante 4-year rate of the Focus survey[3] itself, i.e., $R_t^{n|focus4} = R_t^{focus4}$. The second estimate based on the Focus survey is obtained by excluding the more cyclical movements of the expected 1-year rate with an HP filter. The results obtained with different approaches are presented in Figure 1. For 2023Q1, the median estimate is 5.0% for 1 year and 4.7% for 4 years.

Figure 1 – Ex-ante real Selic rate from the Focus survey



In addition to the point estimate above, the frequency distribution of point estimates may be obtained from the Focus survey itself[4]. Figure 2 presents the result of this exercise considering the 4-year horizon. The figure shows at first a downward trend of the neutral interest rate period, reaching a trough in early 2020 due to the Covid-19 pandemic, after which it starts an upward trajectory. This overall trend is shared by several of the measures presented in this box. For 2023Q1, the median estimate is 4.8%, with an interval of 4.1% and 5.4% between the quartiles (Table 1).

3/ In the text, notations with the superscript "n" correspond to results of inferences about the neutral interest rate, to differentiate them from other interest rate measures observed in the economy.

4/ While in the previous paragraph the medians for expectations of nominal interest rates and inflation were combined, here the expected real rate for each respondent of the Focus survey was calculated to obtain the desired percentiles, which can generate differences in the calculation of the median.

Figure 2 – Real Selic 4 years ahead - Focus percentiles

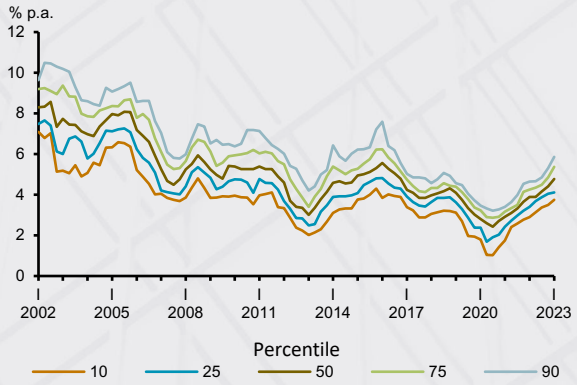


Table 1 – Ex-ante real interest rates from the Focus survey (4 years ahead)
2023Q1

Percentile	Rate (% p.a.)
10th percentile	3.7
25th percentile	4.1
50th percentile	4.8
75th percentile	5.4
95th percentile	5.9

1.2. High and low frequency neutral interest rates

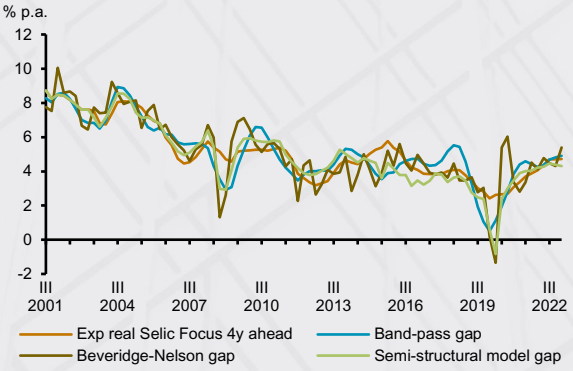
The following estimates are based on Roberts (2018). The author proposes to extract from long-term rates (relevant for the consumption and investment decisions) a "high frequency neutral rate", defined as the rate that maintains the output gap at zero at each point in time. The author also proposes to smooth this measure to clear it from measurement errors and cyclical components, defining the smoothed measure as a "low frequency neutral rate". The box applies this methodology, attempting to extract high and low frequency rates from a previously calculated long run rate, namely, the expected 4-year interest rate from the Focus survey, as describe in the previous section.

More precisely, starting from the rate R_t^{Focus4} from the previous section, the "high frequency" neutral rate $R_t^{n,hf}$ is calculated as the solution to the following equation, which represents an stylized IS curve and thus captures the effect of the interest rate on the economy's output gap:

$$gap_t = \eta\, gap_{t-1} - \sigma\left(R_t^{Focus4} - R_t^{n,hf}\right) \ .$$

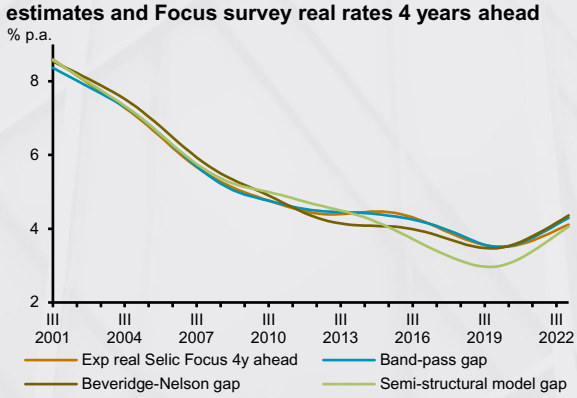
In this equation, the gap comes from the usual estimates in the literature, such as the Band-Pass and Beveridge-Nelson filters, or the output gap of the BCB's semi-structural small-scale model. The parameter η measures the output gap persistence, and is calibrated at 0.84 based on the average persistence of output gaps considered in this exercise. The parameter σ measures the effect on economic activity of the degree of monetary policy tightening (assessed in terms of the medium-run rates), and is calibrated at 0.75 as suggested in Roberts (2018). It should be noticed that different output gap measures and parameters calibration would result in different estimates as well. In particular, for high values of output gap persistence or interest rate sensitivity, the calculated high-frequency neutral rate tends to be close to the rate R_t^{Focus4}. Results for the calculation of the "high frequency neutral rate" are shown in Figure 3. Values for 2023Q1 are between 4.3% and 5.4%, which represent the values that would be necessary to immediately close the output gap in the stylized model above, relating the gap and expected real interest rate in a 4-year horizon.

Figure 3 – High frequency neutral rates from gap estimates and the Focus survey real rates 4 years ahead



Regarding the "low frequency" neutral rate $R_t^{n,lf}$, it is defined by Roberts (2018) as the result of smoothing the high frequency rate so as to remove measurement errors and economic cycle effects. Such smoothing is obtained with an HP filter applied to the high frequency neutral rate, i.e., $R_t^{n,lf} = filter\left(R_t^{n,hf}\right)$. Figure 4 shows the results for the low frequency neutral interest rates. The values for 2023Q1 are between 4.1% and 4.4%, suggesting that in the most recent period the high frequency rate reflects, to a great extent, a relatively strong economic activity.

Figure 4 – Low frequency neutral rates from gap estimates and Focus survey real rates 4 years ahead



1.3. Market interest rates discounting the term premium

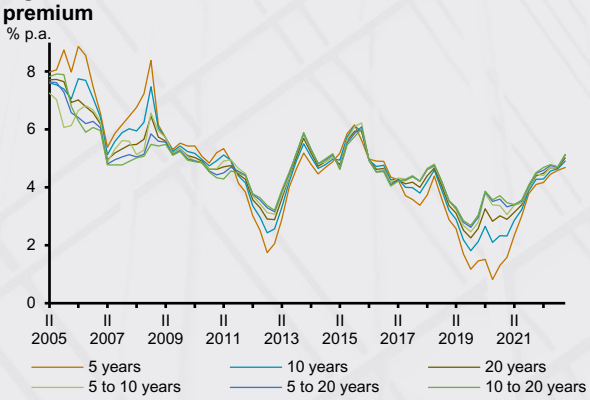
The following estimate is based on long-term market real interest rates, for which it is necessary to remove the term premium. The market based real interest rates used here are extracted from the National Treasury Notes Series B (NTN-B). NTN-B are securities issued by the National Treasury with nominal value updated by the IPCA variation and payment of an IPCA coupon. For longer terms, the IPCA coupons represent a quite reasonable approximation for the real interest rates of these securities[5]. The difference between the real interest rates of the market and the Focus survey at the same horizon is defined as the term premium[6].

5/ See Araujo and Vicente (2017).

6/ It should be noticed that this methodology does not ensure the lack of arbitrage in the forward structure, which is argued to be a second-order factor for the calculation of the neutral interest rate. It should also be observed that four years is the maximum time horizon for which this method is feasible. This is the reason for using it as a parameter for the term premium in other time horizons, again with the purpose of making corrections with first-order effects on the estimated neutral rates.

The neutral rate estimate consists in the use of long-term market rates, discounted accordingly, as direct estimates for the neutral interest rate, i.e. $R_t^{n,market} = R_t^{market} - term\ premium$. Results are presented in Figure 5. Values for 2023Q1 are between 4.7% and 5.1%.

Figure 5 – Real NTN-B rates discounted of the term premium



1.4. Uncovered interest parity

In an open economy with capital flows, the domestic and foreign interest rates are related by uncovered interest parity. Since this relationship should be present in the long run, it is reasonable to suppose that it also relates the natural interest rates of the respective economies. Therefore, the domestic neutral real interest rate can be estimated as the sum of the foreign neutral real interest rate and properly measured risk premia. Note that deflating nominal rates amounts imposes long run purchasing power parity. Among the relevant risk factors, this box considers sovereign and foreign exchange risks.

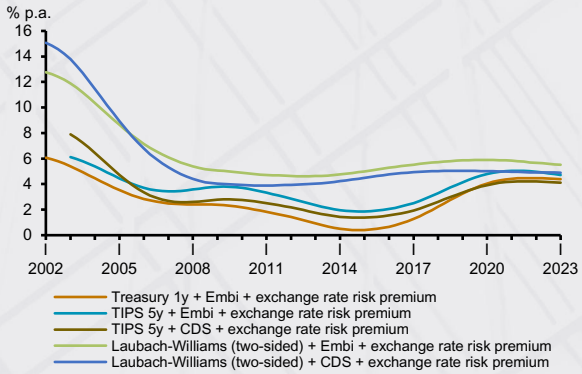
Taking the US economy as the reference foreign country, this exercise considers a nominal US rate deflated by inflation expectations, a US market real rate, and a US neutral interest rate estimated in the literature. More precisely, the nominal foreign interest rate considered here is the 1-year Treasury rate deflated by inflation expectations one year ahead, and smoothed with the HP filter[7]. In addition, the box also uses the 5-year real rate from Treasury Inflation-Protected Securities (TIPS) also smoothed by the HP filter, and the full sample smoothed neutral real interest rate estimated by the Federal Reserve Bank of New York (FED-NY)[8].

For the sovereign risk premia, this box uses the Embi+ and the 5-year CDS for Brazil, both of them HP filtered to obtain long run trends. To calculate the foreign exchange risk premium, the starting point is the parity relationship between the domestic interest rate in BRL (represented in the DI market) and the domestic interest rate in USD (represented in the exchange rate coupon market). According to this parity relationship, the difference between rates should correspond to the sum of the expected BRL depreciation against the USD and the foreign exchange risk premium. The Focus survey in the corresponding time horizon is used again to calculate the expected foreign exchange depreciation implicit in the interest rate differential and thus obtain the risk premium. Similarly to the sovereign risk indicators, an HP filter is applied to the foreign exchange risk premia.

The resulting neutral real interest rates obtained through this approach for the three real representative US interest rates can be seen in Figure 6. Values for 2023Q1 are between 4.1% and 5.5%.

7/ Expectations obtained from the Survey of Professional Forecasters, conducted by the Federal Reserve Bank of Philadelphia.
8/ Bilateral estimate using the Laubach-Williams model.

Figure 6 – Neutral rates based on foreign rates and risk premium



1.5. Neutral interest rate filtered by the semi-structural small-scale model

This approach combines several elements from the previous approaches. In particular, the aggregate model estimates the behavior of aggregate demand (IS curve), monetary authority (Taylor rule), price makers (Phillips curve), and investors arbitraging international interest rates (uncovered interest parity). All these elements were considered in isolation in the previous methods. In the aggregate model, however, all these elements are considered together and properly weighted in the filter that estimates the natural real interest rate trend.[9] In an exercise that imposes a neutral rate of 4.5% in 2023Q3, the figures for 2023Q1 are around 4.8%.

1.6. Neutral interest rate in the Samba model

The Samba model approach will now be considered. Compared to the small-scale model of the previous sub-section, the Samba model encompasses a wider range of patterns in agent's behavior and considers long run trends consistent with economic theory.

Following the usual definition in the literature, the natural rate of the Samba model is the real interest rate in a counterfactual economy where there is no price and wage nominal rigidity.[10] In other words, it is the real interest rate in an hypothetical economy where only real supply and demand shocks determine its evolution over time. For the purpose of comparison with neutral interest rate measures obtained by the other methods in this box, the presentation follows Del Negro *et al.* (2017) by computing the natural interest rate extracted from the Samba model as its expectation for 2 and 5 years ahead. By adopting this procedure, the presented values tend to isolate short-term components – similarly to what filters do in previous methodologies.

The evolution of the natural rate of the Samba model largely tracks the expected variation in productivity within the model. In fact, productivity is a key element in DSGE models for estimating the natural rate, in as far as it links present consumption decisions with the future possibility of higher consumption just by raising productivity.[11] The natural rate reached its lowest values during the 2014-2016 crisis, when the average growth of the Brazilian economy showed a strong deceleration, remaining at a very low level

9/ Further details on the model are available in the box "Revision of the small-scale aggregate model", of the December 2021 IR.

10/ See Del Negro *et al.* (2017) on the formal definition of the natural interest rate in a more recent context, and Zhang *et al.* (2021) on the calculation of natural rates for small open economies.

11/ In technical terms, productivity affects the expected variation for consumption in the Euler equation that determines intertemporal choice of household consumption. The discount factor for this intertemporal choice – the real interest rate – considers the expected productivity of the economy.

(Figures 7 and 8). During the pandemic, the natural interest rate assumes negative values, reflecting the strong deceleration of aggregate demand in the period, with the consequent need for stimuli to reach the "natural" output level. With the end of the pandemic and economic activity recovery, the rate rose again. For 2023Q1, the estimated neutral interest rate lies between 4.5% and 4.8%.

It should be highlighted that the rate presented here is conditional on the DSGE model's structure defined *a priori*. Therefore, on the one hand, the choices about the value of the stationary state in the model justify the fluctuations of the natural interest rate around 4% p.a. in the entire sample. On the other hand, missing elements in the model, such as the financial accelerator, capable of relating economic activity to risk premium measures, may affect the estimation of the natural rate.

Figure 7 – Natural interest rate – 2 years
Samba model

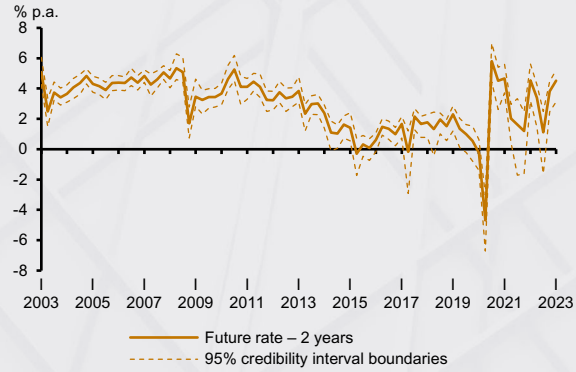
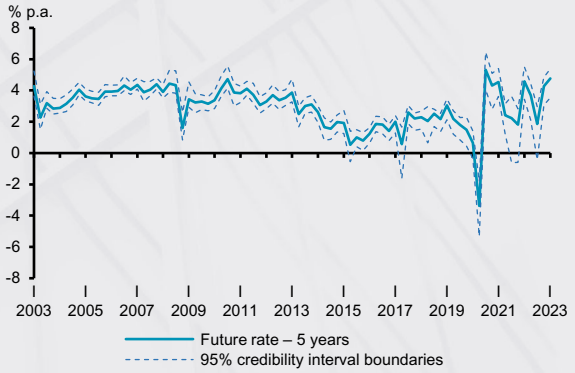


Figure 8 – Natural interest rate – 5 years
Samba model



2. Neutral real interest rates estimated by economic analysts consulted by the BCB

On several occasions over the past few years, in order to consult economic analysts' estimates for the Brazilian economy's neutral interest rate, the BCB has sent the PCQ[12] to participants in the Market Expectations System.[13] Tables 2 and 4 summarize the survey results, which help to contextualize the analysis made by the BCB throughout the box.

Considering the median response (Figure 9), one can see that between 2017 and 2020 the analysts' estimate for the neutral real interest rate decreased for all time horizons[14]. Between June 2020 and August 2021, when the current domestic monetary tightening cycle had already begun, estimates of the short-term and two-year ahead neutral rate rose, but long-term ("five years from now") estimates remained stable. From August 2021 to the most recent consultation, estimates for all time horizons have risen. The sharpest increase is between August and December 2021, with subsequent adjustments being more moderate.

Also according to the same data, one notes that in 2017, analysts' estimate for the neutral rate was higher at the near-term, at 5%, than at the more distant horizons, at 4.5% in two years and 4% in five years. The opposite is seen in June 2020 (around the most acute moment of the global economic crisis associated with the Covid-19 pandemic), when estimates of the short-term neutral real interest rate, at 2%, were at a lower level than estimates for more distant time horizons, at 2.5% in two years and 3% in five years. In the

12/ Further information about this survey may be obtained at https://www.bcb.gov.br/controleinflacao/precopom.

13/ In April 2017 and June 2020, the question was "What is your estimate for the neutral interest rate of the Brazilian economy, in the short term, two years from now, and five years from now?" On the other occasions, the question became explicit about the neutral real interest rate and the exact wording was "What is your estimate for the neutral real interest rate of the Brazilian economy, in the short term, two years from now, and five years from now?"

14/ These data were published on the PCQ page or in previous IR, except for the June 2020 data that had not been released so far.

following surveys, analysts' expectation was for a relatively stable neutral real interest rate between the short term and the next five years.

Finally, data from the most recent survey show less dispersion between point estimates of the neutral rate in the short term, when the range between percentiles 25 and 75 is 4.5% to 5%, than in the medium to long term, when the range is 4% to 5% (see Tables 2 to 4 and Figure 10).

Figure 9 – Median of the neutral interest rate for different time horizons according to the PCQ

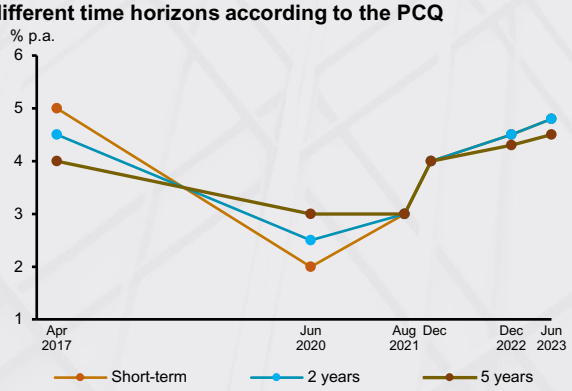


Figure 10 – Quartiles of the neutral interest rate two years ahead according to the PCQ

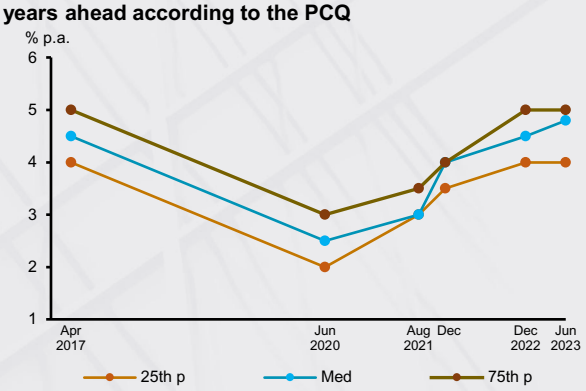


Table 2 – Quartiles of the neutral real interest rate for the short-term according to the PCQ

% p.a.

	25th p	med	75th p
Apr 2017	4.8	5.0	5.5
Jun 2020	1.0	2.0	2.5
Aug 2021	3.0	3.0	3.5
Dec 2021	3.2	4.0	4.2
Dec 2022	4.0	4.5	5.0
Jun 2023	4.5	4.8	5.0

Table 3 – Quartiles of the neutral real interest rate for 2 years ahead according to the PCQ

% p.a.

	25th p	med	75th p
Apr 2017	4.0	4.5	5.0
Jun 2020	2.0	2.5	3.0
Aug 2021	3.0	3.0	3.5
Dec 2021	3.5	4.0	4.0
Dec 2022	4.0	4.5	5.0
Jun 2023	4.0	4.8	5.0

Table 4 – Quartiles of the neutral real interest rate for 5 years ahead according to the PCQ

% p.a.

	25th p	med	75th p
Apr 2017	3.5	4.0	4.5
Jun 2020	2.5	3.0	3.3
Aug 2021	3.0	3.0	3.5
Dec 2021	3.2	4.0	4.0
Dec 2022	4.0	4.3	4.9
Jun 2023	4.0	4.5	5.0

3. Conclusion

Table 5 summarizes the different measures for 2023Q1, including the more recent PCQ presented in the previous section. The median and average of the neutral real interest rate obtained by the different methodologies are both at 4.8%, with an interval from 4.5% to 5.0% considering the 25th and 75th percentiles.

The neutral real interest rate is an unobservable variable whose estimation is subject to high uncertainty. In general, estimates pointed to a downward trend of the neutral interest rate, which reaches a trough in early 2020, due to the Covid-19 pandemic, and then starts an upward trajectory.

Table 5 – Neutral real interest rate in Brazil
Estimates for 2023Q1

Methodology	Rate (% p.a.)
Ex-ante real Selic rate from the Focus survey	
Real Selic expected in 4 years	4.7
Real Selic expected in 1 year, HP filter	5.0
High frequency neutral rates	
Band-Pass gap	4.9
Beveridge-Nelson gap	5.4
Semi-structural model gap	4.3
Low frequency neutral rates	
Band-Pass gap	4.3
Beveridge-Nelson gap	4.4
Semi-structural model gap	4.1
Real market rates discounted of the term premium	
5 years	4.7
10 years	4.9
20 years	5.0
5 to 10 years	5.1
5 to 20 years	5.1
10 to 20 years	5.1
Uncovered interest rate parity	
Treasury 1y + Embi + exchange rate risk premium	4.4
TIPS 5y + Embi + exchange rate risk premium	4.7
TIPS 5y + CDS + exchange rate risk premium	4.1
Laubach-Williams (two-sided) + Embi + exchange rate risk premium	5.5
Laubach-Williams (two-sided) + CDS + exchange rate risk premium	4.9
Natural interest rate from the Samba model	
Two years future rate	4.5
Five years future rate	4.8
Neutral real interest rate from the PCQ[1]	
Short-term median	4.8
2 years median	4.8
5 years median	4.5
Summary	
Mean	4.8
Median	4.8
25th percentile	4.5
75th percentile	5.0

1/ Survey of June 2023.

References

ARAUJO, G.; and VICENTE, J. (2017). "*Estimação da Inflação Implícita de Curto Prazo*", Banco Central do Brasil, Working Paper 460.

BLINDER, A. (1998). "Central banking in theory and practice", Cambridge: MIT Press.

FASOLO, A. M.; ARAÚJO, E.; VALLI JORGE, M.; KORNELIUS, A.; and MARINHO, L. S. G. (2023). "Brazilian macroeconomic dynamics redux: Shocks, Frictions, and Unemployment in SAMBA Model", Banco Central do Brasil, Working Paper 578, March

DEL NEGRO, M.; GIANNONE, D.; GIANNONI, M.P.; and TAMBALOTTI, A. (2017), "Safety, Liquidity, and the Natural Rate of Interest," Brookings Papers on Economic Activity, The Brookings Institution, vol. 48-1 (Spring), pp. 235-316.

ROBERTS, J. M. (2018). "An Estimate of the Long-Term Neutral Rate of Interest", FEDS Notes, Board of Governors of the Federal Reserve System, United States.

ZHANG, R.; MARTÍNEZ-GARCÍA, E.; WYNNE, M. and GROSSMAN, V. (2021). "Ties that bind: estimating the natural rate of interest for small open economies", Journal of International Money and Finance, vol. 113, pp. 1-34.

Appendix

Banco Central do Brasil Management

Monetary Policy Committee (Copom)

Banco Central do Brasil Management

Board of Governors

Roberto de Oliveira Campos Neto
Governor

Carolina de Assis Barros
Deputy Governor for Administration

Fernanda Magalhães Rumenos Guardado
Deputy Governor for International Affairs and Corporate Risk Management

Diogo Abry Guillen
Deputy Governor for Economic Policy
Deputy Governor for Monetary Policy

Maurício Costa de Moura
Deputy Governor for Institutional Relations and Citizenship

Otávio Ribeiro Damaso
Deputy Governor for Regulation

Paulo Sérgio Neves de Souza
Deputy Governor for Supervision

Renato Dias de Brito Gomes
Deputy Governor for Licensing and Resolution

Members of the Monetary Policy Committee (Copom)

Members

Governor
Roberto de Oliveira Campos Neto

Deputy Governor
Carolina de Assis Barros

Deputy Governor
Diogo Abry Guillen

Deputy Governor
Fernanda Magalhães Rumenos Guardado

Deputy Governor
Maurício Costa de Moura

Deputy Governor
Otávio Ribeiro Damaso

Deputy Governor
Paulo Sérgio Neves de Souza

Deputy Governor
Renato Dias de Brito Gomes

Heads of Department Participating in the Copom Meetings (Resolution nr. 61/2021)

Department of Banking Operations and Payments System – Deban
Rogério Antônio Lucca

Department of Economics – Depec
Ricardo Sabbadini

Department of Foreign Reserves – Depin
Alan da Silva Andrade Mendes

International Affairs Department – Derin
Fabia Aparecida de Carvalho

Open Market Operations Department – Demab
André de Oliveira Amante

Research Department – Depep
André Minella

Acronyms

3MMA	3-month moving average
ABPO	Brazilian Corrugated Board Association
ANS	National Supplementary Health Agency
BCB	Banco Central do Brasil
BNDES	Brazilian Development Bank
BPM6	IMF Balance of Payments 6th Issue
CCT	Collective Bargaining
CDS	Credit Default Swap
CMN	National Monetary Council
Cofins	Contribution for Social Security Financing
Continuous PNAD	Continuous National Household Sample Survey
Copom	Monetary Policy Committee
Covid-19	Coronavirus disease 2019
CPI	Consumer Price Index
Depec	Department of Economics
Depep	Research Department
Derin	International Affairs Department
DSTAT	Department of Statistics
EC	Constitutional Amendment
ECB	European Central Bank
Empapel	Brazilian Association of Paper Packaging
FCI	Financial Conditions Indicator
FDIC	Federal Deposit Insurance Corporation
Fed	Federal Reserve
FGI	Investment Guarantee Fund
FGV	Getulio Vargas Foundation
FOMC	Federal Open Market Committee
GAV	Gross Added Value
GDP	Gross Domestic Product
GFCF	Gross Fixed Capital Formation
GNL	Liquefied Natural Gas
HAC	Heteroskedasticity and autocorrelation
HGDNI	Household Gross Disposable National Income
HICP	Harmonized Consumer Price Index
IBC-Br	Central Bank Economic Activity Index
IBGE	Brazilian Institute of Geography and Statistics
IC-Br	Commodities Index – Brazil
ICMS	State Value-Added Tax on Sales and Services
IFI	Independent Fiscal Institution
IIE-Br	Economic Uncertainty Index
INPC	National Consumer Price Index

INSS	National Social Security Institute
IPA-DI	Producer Price Index – Domestic Supply
IPCA	Extended National Consumer Price Index
IPVA	Tax on Automotive Vehicle Ownership
IR	Inflation Report
LC	Complementary Law
LPG	Liquefied Petroleum Gas
LSPA	Systematic Survey of Agricultural Production
MBS	Mortgage-backed securities
Mediator	Labor Collective Bargaining System
MF	Ministry of Finance
MP	Provisional Measure
MTE	Ministry of Labor and Employment
Não usar sigla	Direct investment liabilities
New Caged	New General Registry of Employed and Unemployed Persons
Nuci	Industry Installed Capacity Usage Level
OLS	Ordinary Least Square
OPEC+	Organization of the Petroleum Exporting Countries Plus
p.a.	Per annum
p.p.	Percentage points
PCQ	Pre-Copom Questionnaire
PEAC	Emergency Employment Support Program
PF	Natural person, individuals
PIA	Working Age Population
PIM	Monthly Industrial Survey
PIS	Social Integration Program
PJ	Legal entity, companies
PLP	Complementary bill
PMC	Monthly Retail Trade Survey
PMS	Monthly Survey of Services
PPP	Purchasing Power Parity
Proconve	Air Pollution Control Program for Motor Vehicles
PTC	Quarterly Credit Conditions Survey
s.a.	Seasonally adjusted data
Selic	Special System for Clearance and Custody
SFN	National Financial System
SGS	Time Series Management System
STF	Federal Supreme Court
US	United States of America
VIX	Chicago Board Options Exchange Volatility Index