# MONETARY **POLICY REPORT**

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BANCO DE LA REPUBLICA
COLOMBIA

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# MONETARY **POLICY REPORT**

* Presented by the technical staff to the Board of Directors for its meeting on 27 January 2023.

*Banco de la República*
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# Monetary Policy in Colombia

*Banco de la República* (the Central Bank of Colombia) is required by the Constitution to maintain the purchasing power of Colombia's currency in coordination with general economic policy[1]. In order to fulfill this mandate, *Banco de la República*'s Board of Directors (hereafter BDBR) has adopted a flexible inflation-targeting scheme, by which monetary policy actions (MP) seek to lead inflation to a specific target and achieve maximum levels of sustainable output and employment.

The flexibility of this scheme allows the BDBR to maintain an adequate balance between reaching its inflation target and smoothing output and employment fluctuations around their sustainable growth paths. The BDBR has set a 3% inflation target based on annual change in the consumer price index (CPI). In the short term, inflation may be affected by factors outside of monetary policy control, such as changes in food prices due to climate-related phenomena. To factor in this reality, the BDBR has also set a ±1 percentage point range outside its inflation target (i.e., 3.0 ± 1 pp). This range does not represent a monetary policy target, but rather reflects the fact that inflation can fluctuate around the target and will not always be equal to 3%.

The main instrument used by the BDBR to control is the policy interest rate (overnight repo rate, or benchmark interest rate). Given that monetary policy actions take time to have their full effect on the economy and inflation[2], the BDBR assesses the inflation forecast and inflation expectations vis-à-vis the inflation target, as well as the current situation and outlook of the economy, in order to determine their value.

The BDBR meets once a month, producing monetary policy decisions in eight of its meetings (January, March, April, June, July, September, October, and December). In principle, no such decisions are made in the BDBR's four remaining meetings (February, May, August, and November)[3]. At the end of the meetings in which monetary policy decisions are produced, a press release is published and a press conference held by the Governor of the Central Bank and the Minister of Finance. The minutes of the meeting describing the positions that led the BDBR to its decision are published on the following business day. Additionally, the Monetary Policy Report (MPR)[4], produced by the Central Bank's technical staff, is published in January, April, July, and October, together with the minutes. On the Wednesday of the week following the Board meeting, the Governor clarifies concerns about the minutes, and the Bank's Deputy Technical Governor presents the MPR. This dissemination scheme[5] seeks to deliver relevant and up-to-date information to contribute to better decision-making by the agents of the economy.

1 Political Constitution of Colombia (1991), Article 373 and Decision C-481/99 of the Constitutional Court.

2 For further details, see M. Jalil and L. Mahadeva (2010). "Transmission Mechanisms of Monetary Policy in Colombia", Universidad Externado de Colombia, Faculty of Finance, Government, and International Relations, ed. 1, vol. 1, no. 69, October.

3 A Board Member may request an extraordinary meeting at any time to make MP decisions.

4 Formerly known as the Inflation Report.

5 The current communication scheme was approved by the BDBR in its August 2019 meeting

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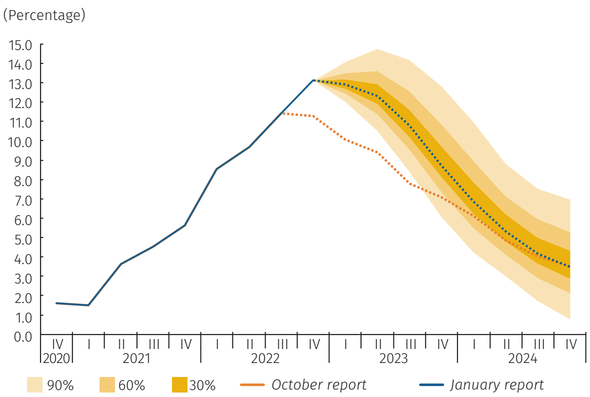
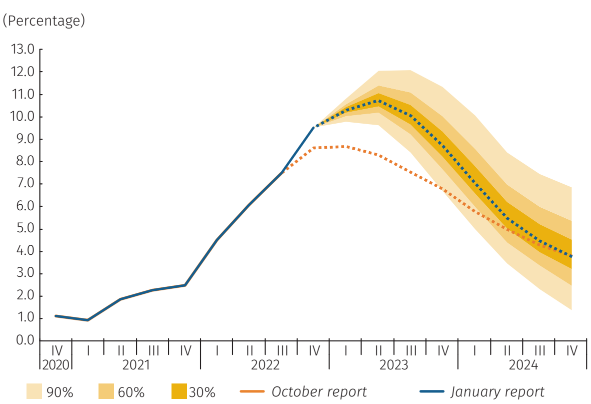
# 1. Summary

Graph 1.1
Consumer Price Index [a/b/]
(annual change; end-of-period)




a/ This graph presents the forecast probability distribution on an eight-quarter time horizon. Density characterizes the prospective balance of risks with areas of 30%, 60%, and 90% probability surrounding the central forecast (mode), through a combination of densities from the *Patacon* and the 4GM monetary policy models.
b/ The probability distribution corresponds to the forecast exercise from the *January report*.
Source: DANE – calculations and projections by *Banco de la República*.

Graph 1.2
CPI excluding food and regulated items [a/b/]
(annual change; end-of-period)




a/ This graph presents the forecast probability distribution on an eight-quarter time horizon. Density characterizes the prospective balance of risks with areas of 30%, 60%, and 90% probability surrounding the central forecast (mode), through a combination of densities from the *Patacon* and the 4GM monetary policy models.
b/ The probability distribution corresponds to the forecast exercise from the *January report*.
Source: DANE – calculations and projections by *Banco de la República*.

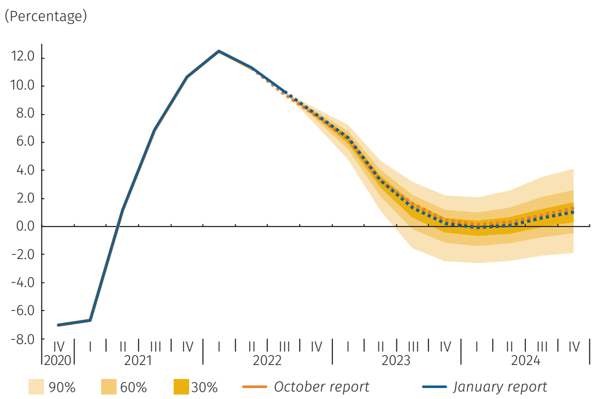
## 1.1 Macroeconomic Summary

**In December, headline inflation (13.1%) and the average of the core inflation measures (10.3%) continued to trend upward, posting higher rates than those estimated by the Central Bank's technical staff and surpassing the market average. Inflation expectations for all terms exceeded the 3.0% target.** In that month, every major group in the Consumer Price Index (CPI) registered higher-than-estimated increases, and the diffusion indicators continued to show generalized price hikes. Accumulated exchange rate pressures on prices, indexation to high inflation rates, and several food supply shocks would explain, in part, the acceleration in inflation. All of this is in a context of significant surplus demand, a tight labor market, and inflation expectations at different terms that exceed the 3.0% target. Compared to the October edition of the *Monetary Policy Report*, the forecast path for headline and core inflation (excluding food and regulated items: EFR) increased (Graphs 1.1 and 1.2), reflecting heightened accumulated exchange rate pressures, price indexation to a higher inflation rate (CPI and the producer price index: PPI), and the rise in labor costs attributed to a larger-than-estimated adjustment in the minimum wage. Nevertheless, headline inflation is expected to begin to ease by early 2023, although from a higher level than had been estimated in October. This would be supported initially by the slowdown forecast for the food CPI due to a high base of comparison, the end anticipated for the shocks that have affected the prices of these products, and the estimated improvement in external and domestic supply in this sector. In turn, the deterioration in real household income because of high inflation and the end of the effects of pent-up demand, plus tighter external and domestic financial conditions would contribute to diluting surplus demand in 2023 and reducing inflation. By the end of 2023, both headline and core (EFR) inflation would reach 8.7% and would be 3.5% and 3.8%, respectively, by December 2024. These forecasts are subject to a great deal of uncertainty, especially concerning the future behavior of international financial conditions, the evolution of the exchange rate, the pace of adjustment in domestic demand, the extent of indexation of nominal contracts, and the decisions taken regarding the domestic price of fuel and electricity.

**In the third quarter, economic activity surprised again on the upside and the growth projection for 2022 rose to 8.0% (previously 7.9%). However, it declined to 0.2% for 2023 (previously 0.5%). With this, surplus demand continues to be signifi-**

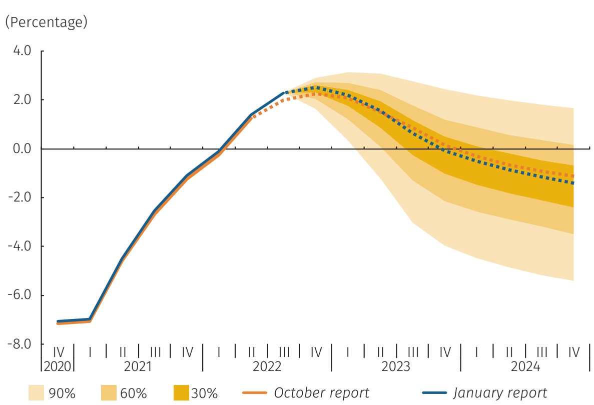
**cant and is still expected to weaken during the current year.** Annual economic growth in the third quarter (7.1 % SCA)[1] was higher than estimated in October (6.4 % SCA), given stronger domestic demand specifically because of higher-than-expected investment. Private consumption fell from the high level witnessed a quarter earlier and net exports registered a more negative contribution than anticipated. For the fourth quarter, economic activity indicators suggest that gross domestic product (GDP) would have remained high and at a level similar to that observed in the third quarter, with an annual variation of 4.1%. Domestic demand would have slowed in annual terms, although at levels that would have remained above those for output, mainly because of considerable private consumption. Investment would have declined slightly to a value like the average observed in 2019. The real trade deficit would have decreased due to a drop in imports that was more pronounced than the estimated decline in exports. On the forecast horizon, consumption is expected to decline from current elevated levels, partly because of tighter domestic financial conditions and a deterioration in real income due to high inflation. Investment would also weaken and return to levels below those seen before the pandemic. In real terms, the trade deficit would narrow due to a lower momentum projection for domestic demand and higher cumulative real depreciation. In sum, economic growth for all of 2022, 2023, and 2024 would stand at 8.0%, 0.2% and 1.0%, respectively (Graph 1.3). Surplus demand remains high (as measured by the output gap) and is expected to decline in 2023 and could turn negative in 2024 (Graph 1.4). Although the macroeconomic forecast includes a marked slowdown in the economy, an even greater adjustment in domestic absorption cannot be ruled out due to the cumulative effects of tighter external and domestic financial conditions, among other reasons. These estimates continue to be subject to a high degree of uncertainty, which is associated with factors such as global political tensions, changes in international interest rates and their effects on external demand, global risk aversion, the effects of the approved tax reform, the possible impact of reforms announced for this year (pension, health, and labor reforms, among others), and future measures regarding hydrocarbon production.

Graph 1.3
Gross Domestic Product, four quarter accumulation [a/b/c/]
(annual change)




a/ This graph presents the forecast probability distribution on an eight-quarter time horizon. Density characterizes the prospective balance of risks with areas of 30%, 60%, and 90% probability surrounding the central forecast (mode), through a combination of densities from the *Patacon* and the 4GM monetary policy models.
b/ Seasonally adjusted and corrected for calendar effects.
c/ The probability distribution corresponds to the forecast exercise from the *January report*.
Source: DANE, calculations and projections by *Banco de la República*.

Graph 1.4
Output gap [a/b/c/] - Predictive Densities
(four-quarter accumulation)




a/ The historical output gap estimate is calculated as the difference between observed GDP (four-quarter accumulation) and potential GDP (trend; four-quarter accumulation) based on the 4GM model.
b/ This graph presents the forecast probability distribution on an eight-quarter time horizon. Density characterizes the prospective balance of risks with areas of 30%, 60%, and 90% probability surrounding the central forecast (mode), through a combination of densities from the *Patacon* and the 4GM monetary policy models.
c/ The probability distribution corresponds to the forecast exercise from the *January report*.
Source: DANE, calculations and projections by *Banco de la República*.

**In 2022, the current account deficit would have been high (6.3 % of GDP), but it would be corrected significantly in 2023 (to 3.9 % of GDP) given the expected slowdown in domestic demand**. Despite favorable terms of trade, the high external imbalance that would occur during 2022 would be largely due to domestic demand growth, cost pressures associated with high freight rates, higher external debt service payments, and good performance in terms of the profits of foreign companies.[2] By 2023, the adjustment in domestic demand would be reflected

1 Seasonally and calendar adjusted.

2 In the current account aggregate, the pressures for a higher external deficit come from those companies with FDI that are focused on the domestic

in a smaller current account deficit especially due to fewer imports, a global moderation in prices and cost pressures, and a reduction in profits remitted abroad by companies with foreign direct investment (FDI) focused on the local market. Despite this anticipated correction in the external imbalance, its level as a percentage of GDP would remain high in the context of tight financial conditions.

**In the world's main economies, inflation forecasts and expectations point to a reduction by 2023, but at levels that still exceed their central banks' targets. The path anticipated for the Federal Reserve (Fed) interest rate increased and the forecast for global growth continues to be moderate.** In the fourth quarter of 2022, logistics costs and international prices for some foods, oil and energy declined from elevated levels, bringing downward pressure to bear on global inflation. Meanwhile, the higher cost of financing, the loss of real income due to high levels of global inflation, and the persistence of the war in Ukraine, among other factors, have contributed to the reduction in global economic growth forecasts. In the United States, inflation turned out to be lower than estimated and the members of the Federal Open Market Committee (FOMC) reduced the growth forecast for 2023. Nevertheless, the actual level of inflation in that country, its forecasts, and expectations exceed the target. Also, the labor market remains tight, and fiscal policy is still expansionary. In this environment, the Fed raised the expected path for policy interest rates and, with this, the market average estimates higher levels for 2023 than those forecast in October. In the region's emerging economies, country risk premia declined during the quarter and the currencies of those countries appreciated against the US dollar. Considering all the above, for the current year, the Central Bank's technical staff increased the path estimated for the Fed's interest rate, reduced the forecast for growth in the country's external demand, lowered the expected path of oil prices, and kept the country's risk premium assumption high, but at somewhat lower levels than those anticipated in the previous *Monetary Policy Report*. Moreover, accumulated inflationary pressures originating from the behavior of the exchange rate would continue to be important.

**External financial conditions facing the economy have improved recently and could be associated with a more favorable international context for the Colombian economy**. So far this year, there has been a reduction in long-term bond interest rates in the markets of developed countries and an increase in the prices of risky assets, such as stocks. This would be associated with a faster-than-expected reduction in inflation in the United States and Europe, which would allow for a less restrictive course for monetary policy in those regions. In this context, the risks of a global recession have been reduced and the global appetite for risk has increased. Consequently, the risk premium continues to decline, the Colombian peso has appreciated significantly, and TES interest rates have decreased. Should this trend consolidate, exchange rate inflationary pressures could be less than what was incorporated into the macroeconomic forecast. Uncertainty about external forecasts and their impact on the country remains high, given the unpredictable course of the war in Ukraine, geopolitical tensions, local uncertainty, and the extensive financing needs of the Colombian government and the economy.

**High inflation with forecasts and expectations above 3.0%, coupled with surplus demand and a tight labor market are compatible with a contractionary stance on monetary policy that is conducive to the macroeconomic adjustment needed to mitigate the risk of de-anchoring inflation expectations and to ensure that in-**

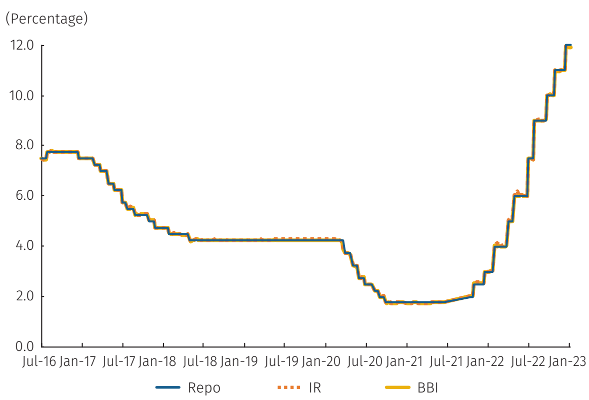
market. In contrast, profits in the mining and energy sectors are more than offset by the external revenue they generate through exports.

**flation converges to the target.** Compared to the forecasts in the October edition of the *Monetary Policy Report*, domestic demand has been more dynamic, with a higher observed level of output exceeding the productive capacity of the economy. In this context of surplus demand, headline and core inflation continued to trend upward and posted surprising increases. Observed and expected international interest rates increased, the country's risk premia lessened (but remains at high levels), and accumulated exchange rate pressures are still significant. The technical staff's inflation forecast for 2023 increased and inflation expectations remain well above 3.0%. All in all, the risk of inflation expectations becoming unanchored persists, which would accentuate the generalized indexation process and push inflation even further away from the target. This macroeconomic context requires consolidating a contractionary monetary policy stance that aims to meet the inflation target within the forecast horizon and bring the economy's output to levels closer to its potential.

## 1.2 Monetary Policy Decision

At its meetings in December 2022 and January 2023, *Banco de la República*'s Board of Directors (BDBR) agreed to continue the process of normalizing monetary policy. In December, the BDBR decided by a majority vote to increase the monetary policy interest rate by 100 basis points (bps) and in its January meeting by 75 bps, bringing it to 12.75% (Graph 1.5).

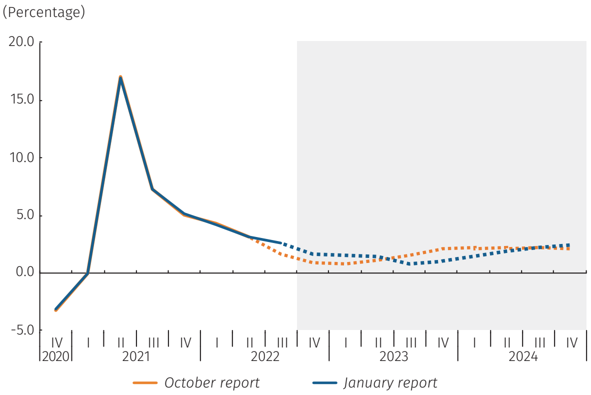
Graph 1.5
Monetary policy interest rate, interbank rate and BBI[a/]
(weekly data)




a/ IR: interbank rate. BBI: benchmark banking indicator (right axis). Repo: Monetary policy rate.
Sources: Office of the Financial Superintendent of Colombia and *Banco de la República*.

# 2. Macroeconomic Forecasts and Risk Analysis

Graph 2.1 Real GDP, main trade partners
(Annualized change, projections according to full-year assumption)




Sources: Bloomberg, statistics offices and central banks, calculations and projections by *Banco de la República*.

## 2.1 International Outlook

### 2.1.1 Foreign Demand

**In 2023, the country's relevant foreign demand would decelerate significantly (Graph 2.1),** against a backdrop where most of our trading partners would continue with inflation above their targets (Graph 2.2), a restrictive monetary policy, and relatively high international interest rates and high global uncertainty. This amid the continuance of various shocks, such as Russia's invasion of Ukraine and the energy crisis in Europe. Consequently, the outlook for international trade and world economic growth has deteriorated,[3] although multilateral organizations do not yet foresee a central scenario of a global economic recession. For 2023, the growth assumption for the country's trading partners has been revised down (1.2% versus 1.4% in the previous report) and anticipates a slowdown, in contrast to the 3.0%[4] growth estimated for 2022. Finally, the forecast anticipates a 2.0% growth for 2024, lower than the historical average for this indicator[5] (Table 2.1). Furthermore, the considerable uncertainty around this assumption and the international economic environment as a whole is of note, particularly due to the potential effects of China's lifting of COVID-related restrictions and the likelihood that inflation in developed countries may be easing faster than expected.

**A sharp slowdown in the U.S. economy is expected for 2023.** After the surprise on the upside for growth in the third quarter of 2022, real GDP in the United States is expected to decelerate to some extent during the last quarter of the year.[6] Looking ahead, it is anticipated that private consumption dynamics will continue to be affected by inflation that, despite its slowdown, is anticipated will remain high, accompanied by deteriorating financial conditions and household confidence that remains relatively low. This coupled with the weakening of the real estate and construction sectors, as well as setbacks

Table 2.1
Economic growth forecast of main trade partners [a/]

| Main Partners | 2021 (pre) | 2022 (proj) | 2023 (proj) | 2024 (proj) |
|---|---|---|---|---|
| United States | 5.9 | 2.0 | 0.6 | 1.2 |
| Eurozone | 5.3 | 3.3 | -0.2 | 1.4 |
| China | 8.1 | 3.0 | 4.6 | 4.9 |
| Ecuador | 4.2 | 2.9 | 2.0 | 2.3 |
| Brazil | 5.0 | 3.1 | 0.6 | 1.7 |
| Peru | 13.6 | 2.7 | 2.3 | 2.8 |
| Mexico | 4.7 | 3.0 | 1.2 | 1.8 |
| Chile | 11.7 | 2.5 | -1.0 | 2.3 |
| WA trade partners [a/] | 7.1 | 3.0 | 1.2 | 2.0 |

(pre): preliminary, (proj): projected
a/ Weighted average based on trade contribution.
Sources: Bloomberg, Focus Economics, national statistics offices, and central banks (observed data), calculations and projections by *Banco de la República*.

3 In its January report, the World Bank revised down its global economic growth forecast for 2023 from 3.4% to 2.2%. In addition, for this year, the Bank considers world trade volumes would grow by 1.6%, lower than those projected in the previous report (4.3 %).

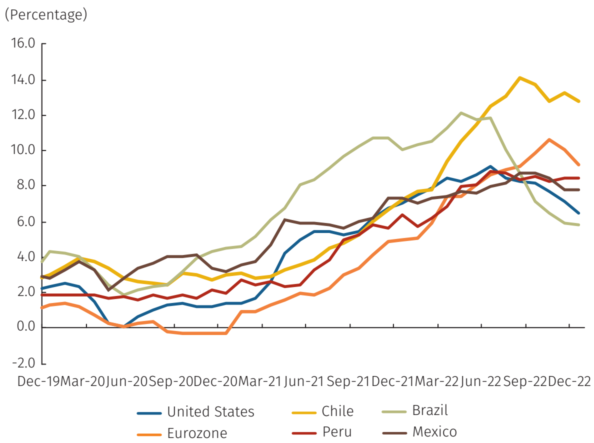
4 Higher estimate than the October report assumption (2.5%).

5 The historical average annual growth rate of trading partners between 2001 and 2021 was 2.8%.

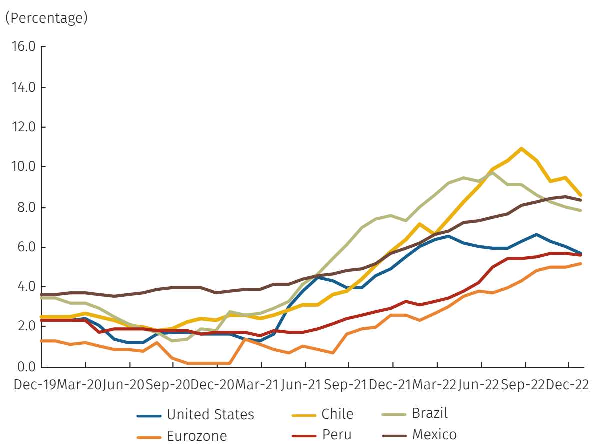
6 For the third quarter of 2022, U.S. real GDP grew by 3.2% quarterly annualized (q.a.) after two consecutive contractions, (-1.6% in the first quarter and -0.6% in the second quarter). At the close of this report, according to preliminary Graphs the GDP of the United States expanded by 2.9% quarterly annualized in the fourth quarter of 2022.

Graph 2.2
Total inflation, selected main trading partners

A. Headline Inflation




B. Core Inflation




Source: Bloomberg.

in industrial production. These factors would be partially offset by a tighter labor market.[7] In addition, the eurozone's GDP for the third quarter decelerated (1.2% quarterly annualized, q.a.), although at a lesser pace than expected by the market. In the fourth quarter of 2022, economic activity would have contracted on a quarterly basis for this set of countries. The weakening of economic activity in the eurozone is expected to continue in the future given the pressures from the energy crisis, high uncertainty, high inflation (Graph 2.2), low confidence among economic agents, a global economic slowdown and tightening of monetary policy (Graph 2.3, panel A). Hence, taking into account the third quarter results and the estimate for the fourth quarter, the growth assumption for the United States and the eurozone was revised upward for the whole of 2022, but a slowdown in the United States and a moderate contraction in the euro area are expected for 2023.[8] China, on the other hand, experienced a 3.0% increase in economic growth during 2022, less than that anticipated in the previous report, partly attributed to the negative impact of the Covid-19 restrictions.[9] For 2023, this country's economic activity would improve as a result of the easing of the pandemic-related restrictions and extensive government stimulus measures. Nevertheless, its growth would continue to be affected by lower demand for its exports, the weakening of its real estate sector and potential further impacts on economic activity due to new virus outbreaks.

**In 2023, a slowdown in growth (1.3%) is expected for Latin America's main trading partners[10] following the 2.9% estimated for 2022.** In the third quarter of 2022, the economic activity of Latin America's main trading partners was higher than expected, with the exception of Peru. Taking into account the above and the fourth quarter estimates, the real GDP growth forecast was revised upward for Brazil, Chile, Ecuador and, to a greater extent, Mexico for the whole of 2022. However, the economies of the region continue to face high inflation (Graph 2.2), although for some countries this indicator could have peaked in 2022. In turn, the contractionary stance of monetary policy (Graph 2.3, panel B) would have an impact on the momentum of these economies, although in some cases this policy is expected to begin to temper over the course of 2023. Moreover, political, and social uncertainty in some countries will continue to affect domestic demand. Externally, a deceleration is expected in a situation of lower and more volatile international commodi-

7 In December 2022, the unemployment rate decreased (3.5%) and there were surprises on the upside in job creation.

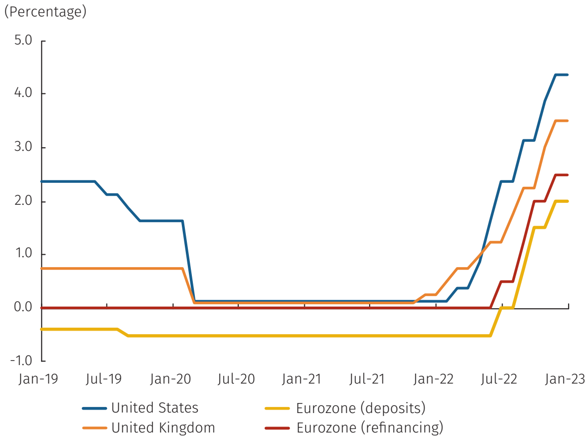
8 In particular, the European Central Bank foresees a slight contraction in its central scenario for early 2023.

9 For Q4 2022, China's real GDP slowed (2.9%) due to supply disruptions and weakening domestic demand along with a surge of Covid-19 flare-ups.

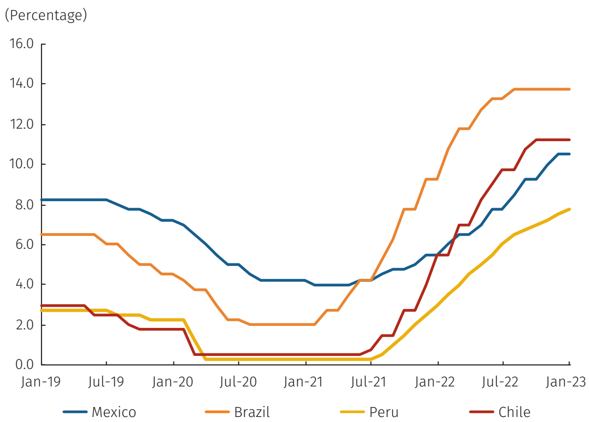
10 This corresponds to the average trade-weighted real GDP for Ecuador, Brazil, Chile, Mexico, and Peru.

Graph 2.3
Monetary policy interest rate, selected main trading partners

A. Developed Economies

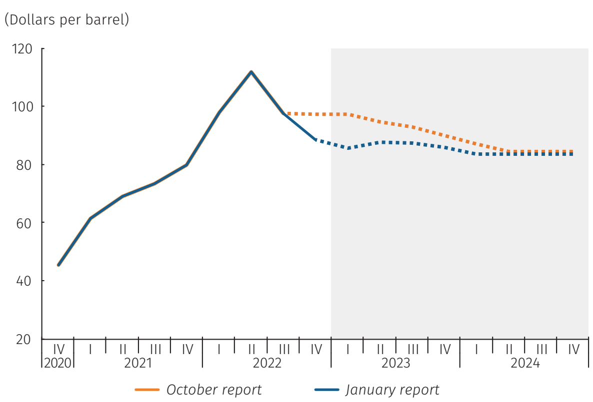



B. Latin America




Note: January 2023 includes data observed on the 24th of said month. For the United States, data is for the midpoint of the range.
Source: Bloomberg

Graph 2.4
Assumed quarterly oil price




Source: Bloomberg, calculations and projections by *Banco de la República*.

ty prices and a slowdown in global economic growth. Consequently, economic growth for Peru, Mexico and, particularly Chile - where a sharp economic contraction is expected - was revised down for 2023; in the case of Brazil and Ecuador, the predicted slowdown remains at comparable rates to those forecast in the previous report.

### 2.1.2 International Prices

**The oil price forecast was revised down from the previous report, with lower average prices expected in 2023 and 2024 versus 2022 (Graph 2.4)**. In the fourth quarter of 2022, the average Brent crude oil benchmark price was close to USD 89 per barrel (bl), lower than the Graph projected by the technical staff in the October report. However, thus far this year to January 20, this indicator stood at around USD 83 per barrel. This decline in oil prices has occurred in a scenario of improved gas supplies and a milder European winter, the impact of the pandemic on China's economy, the rerouting of Russian oil exports and a relatively strong US dollar (Graph 2.5, panel A), as well as the implementation of an oil price cap on Russia crude exports by the G7 and Australia. The above, together with the expectation of lower global economic growth, a more restrictive monetary policy by the Fed and increased oil production by several countries, [11] explains the anticipated lower oil average Brent benchmark price of close to USD 87/bl in 2023 and USD 84/bl in 2024. This assumption remains relatively high and above the pre-pandemic level, given the current scenario of continued production cuts by the Organization of the Petroleum Exporting Countries and its allies (OPEC+), low inventory levels (Graph 2.5, panel B), restrained sector reaction despite high international prices and the abrupt elimination of the harsh Covid-related restrictions in China. In general, uncertainty about the future course of oil prices remains high due to the manifold shocks affecting this market. In turn, a moderate annual decrease in the terms of trade is expected for 2023, as the lower prices of the primary goods exported by the country (oil, coal and coffee) would be partially offset by a drop in imports priced in US dollars as global supply chains regularize (Graph 2.6) and global demand pressures decrease.

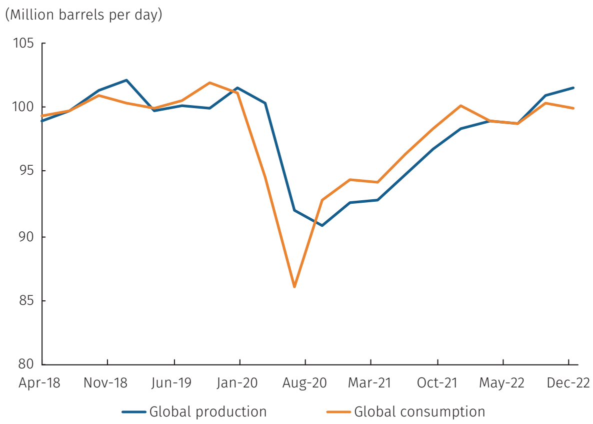
**By 2023, global inflation is expected to moderate from the high levels seen in 2022 amid weakening demand, tighter monetary policy, lower commodity prices and the tempering of global supply shocks.** According to the World Bank, [12]global headline CPI inflation would have peaked at 7.6% in 2022. In particular, inflation was above target in practically all countries that have adopted an inflation-targeting regime. By

11 Countries that would increase their production include the United States, Norway, Brazil, Canada, and Guyana, among others.

12 World Bank. 2023. *Global Economic Prospects, January 2023.*

Graph 2.5
Global oil and other liquid fuels market

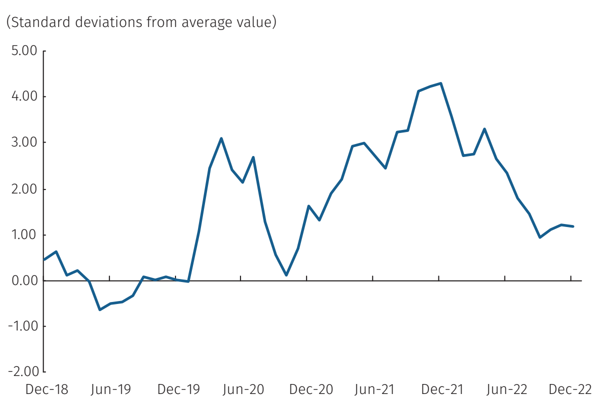
A. Global production and consumption balance




B. Commercial inventory, OECD countries


Sources: U.S. Energy Information Administration.

Graph 2.6
Global Supply Chain Pressure Index a/




a/ For its construction the authors used international shipping indicators (Baltic Dry Index (BDI), Harpex index, among others) and certain subcomponents of the Purchase Manager Index (PMI) surveys for the Eurozone, China, Japan, South Korea, Taiwan, the UK, and the US.
Sources: Gianluca Benigno, Julian di Giovanni, Jan J. J. Groen, and Adam I. Noble, "A New Barometer of Global Supply Chain Pressures" Federal Reserve Bank of New York Liberty Street Economics, 04 January 2022.

2023 and 2024, global CPI headline inflation would moderate to 5.2% and 3.2%, respectively, yet remain above the average 2.3% experienced in the five pre-pandemic years (2015-2019). According to this agency, although a decrease in headline inflation is expected during the current year, there are signs that higher core inflation could persist. In December, headline and core annual inflation in the United States declined to 6.5% and 5.7%, respectively, versus the 7.1% and 6.0% levels seen in November (Graph 2.2). Lower energy prices and lower inflationary pressures on goods contributed to the decrease in annual headline inflation. Nevertheless, the services component, particularly housing costs[13] and food prices, is placing upward pressure on inflation. For its part, this month the annual headline inflation in the eurozone fell to 9.2% from the 10.1% recorded in November, while core inflation increased to 5.2% from the 5.0% seen in the previous month (Graph 2.2). Forward-looking market expectations for the United States and the eurozone suggest that headline inflation will continue to diminish, although inflation will remain above its target (2.0%) for the current year.

### 2.1.3 International financial developments

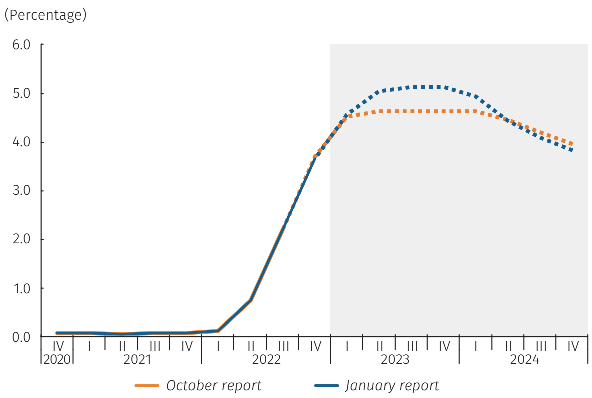
**For 2023, the monetary policy interest rate in the United States was adjusted up and additional increases are expected during the first part of the year (Graph 2.7). For 2024, interest rate reductions are anticipated, which would place it at between 3.50% and 3.75% by the end of the year.** At its December 13-14 meeting, the Federal Open Market Committee (FOMC) reduced its pace of increases and raised the target range for the federal funds rate to 50 bp, placing it between 4.25% and 4.50%, in line with the technical staff's expectation in the previous report. At the same time, the FOMC indicated that it would continue to monitor money market conditions as it continues with its balance sheet reduction. This has occurred within a context of a tight labor market and a moderation in inflation and its expectations, although inflation remains at levels above its target. Simultaneously, for the end of 2023 and 2024, the median of the new FOMC projections considers a higher monetary policy interest rate relative to that forecast in September.[14] For 2023, market and futures survey-based[15] estimates related to the monetary policy interest rate show a steeper benchmark interest rate path than that contemplated in the October report. In view of the above, the

13 Housing-related services increased in annual terms, climbing from 7.1% in November to 7.5% in December, while all other services remained at 6.4%.

14 For yearend 2023, the forecast median climbed to 5.1% from 4.6% in September; for yearend 2024, the modification was from 3.9% to 4.1%.

15 The median of the New York Federal Reserve's surveys of both primary dealers (SPD) and market participants (SMP) increased from 3.88% in September to 4.88% December for the last quarters of 2023 and from 2.63% in September to 3.25% and 3.13% in December for the last quarters of 2024.

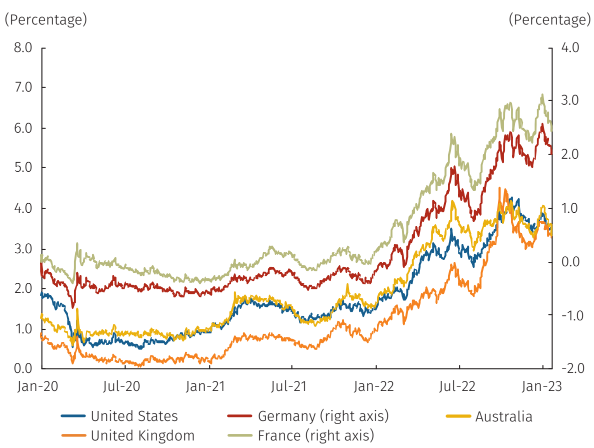
Graph 2.7
Assumed U.S. Federal Reserve quarterly interest rate



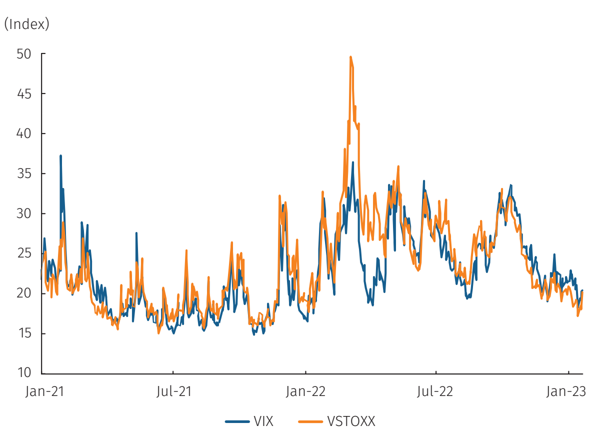

Source: Federal Reserve Bank of Louis, calculations and projections by *Banco de la República.*

Graph 2.8
U.S. Treasury bonds and risk indicators for select developed economies

A. 10-year government bonds yield curve, developed economies




B. Risk indicators in advanced economies




Note: Data to January 19, 2023
Sources: Bloomberg.

assumption for the United States' monetary policy interest rate was revised up for the current year. Specifically, increases of 25 basis points are expected in each of the following three meetings, placing the rate between 5.00% and 5.25% in May, and remaining unchanged until the fourth quarter of 2023. As of the first quarter of 2024, reductions would begin to bring the interest rate to a range of 3.50% to 3.75% by yearend as inflation approaches its target. On the other hand, in December, the European Central Bank (ECB) increased its benchmark interest rates by 50 bps, restraining its degree of increases. According to market expectations, there will be additional increases in its benchmark rates in the coming months.[16] In general, the central banks of several countries would maintain or tighten their monetary policy, seeking to steer inflation to its target.

**During the fourth quarter of 2022, international financial conditions remained tight.** On the one hand, the average interest rates of long-term public debt securities in developed economies increased in comparison with the previous quarter (Graph 2.8, panel A). In addition, the yield curve in the United States remained inverted and reached its steepest negative slope in recent quarters (2 months and 10 years). The average liquidity of the U.S. public debt market was significantly lower than in the previous quarter. Likewise, at the close of 2022, the world's main securities exchanges and debt markets recorded their worst performance in years.[17] For Colombia, local foreign exchange cash balance data point to foreign investments portfolio outflows in the fourth quarter of the year of USD 343 million (m). This is in contrast to inflows of USD 965 m recorded during the third quarter of the year, and investment portfolio inflows registered in emerging economies totaling USD 48,600 m during the fourth quarter of 2022, the highest recorded during the year.[18]

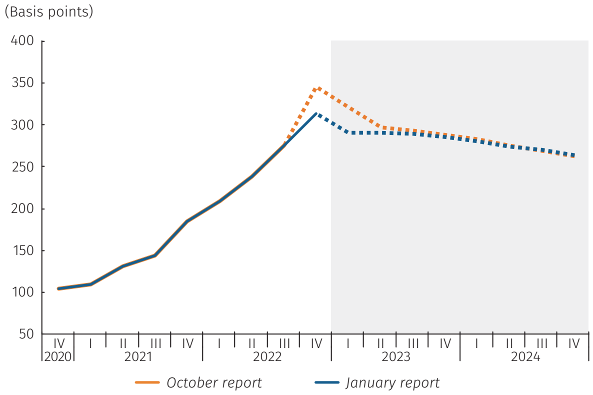
**The forecast horizon assumes a slightly lower risk premium for Colombia than that of the October report. Nevertheless, it would remain above its historical average (Graph 2.9).** During the last two months of 2022, volatility indicators in developed countries (Vix and Vstoxx) declined from the highs reached in October (Graph 2.8, panel B). The same was true for risk premiums in several emerging countries (Graph 2.10,

16 The median responses of the survey conducted by the ECB anticipates that the main refinancing operations (MRO) rate would rise from 2.50% in December 2022 to 3.25% by the end of 2023; the deposit facility rate (DFR) from 2.00% to 2.75%, respectively; and the marginal lending facility (MLF) rate from 2.75% to 3.50% in the same horizon.

17 According to the MSCI Indexes in USD, between 31 December 2021 and 30 December 2022, the securities market in China fell by 24%, those of emerging countries by 22%, in the United States by 21%, those of Europe by 20% and Japan's by 19%. For the same period, the J.P. Morgan Emerging Markets Bond Index Global Diversified (EMBIGD) recorded the biggest drop since its creation in 1994 (-21.6%).

18 According to Institute of International Finance (IIF) data.

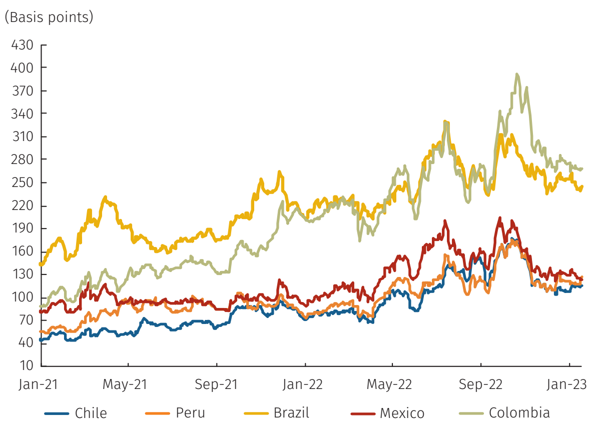
Graph 2.9
Colombia's assumed quarterly risk premium (CDS) [a/]




a/ Five-year credit default swaps.
Source: Bloomberg, calculations and projections by *Banco de la República*.

Graph 2.10
Behavior of nominal exchange rate and risk premium for select Latin American countries

A. Five-year credit default swaps




B. Nominal exchange rate


Note: Data to January 19, 2023
Source: Bloomberg, calculations by *Banco de la República*.

panel A). In the case of Colombia, the average five-year credit default swap (CDS) went from 352 bps in October (a thirteen-year high) to 276 bps in December. However, the country risk premium remained above its historical average and above what was observed before the pandemic, averaging 314 bps in the fourth quarter of 2022 (lower than the 346 bps expected by the technical staff in the October report). Likewise, the US dollar's global strength tempered during the last two months of last year, although this trend was less evident for the Colombian peso.[19] (Graph 2.10, panel B). The high levels at which Colombia's risk premium remains are observed against a backdrop of global factors including high geopolitical uncertainty, the expectation of additional interest rate increases in advanced economies, the possibility of a resurgence of Covid-19 after the reopening of the Chinese economy, and fears of a global economic recession. This is in addition to idiosyncratic aspects including the fiscal and current account deficit and public debt levels, local uncertainty and a foreign currency credit rating that remains below investment grade. Given the above, a slightly lower risk premium is assumed with respect to the October report, which would average 289 bps in 2023, with an expected decrease in 2024 to average 272 bps that year, consistent with an improvement in the international financial situation and the expected reduction of the country's macroeconomic imbalances.

**Recently, the international financial conditions the economy is facing have improved and could be associated with more favorable international conditions.** So far this year, a reduction in long-term bond interest rates in advanced countries' markets and an increase in the prices of risky assets, such as stock, has been observed. This could be associated with a faster-than-expected inflation decrease in the United States and Europe, which could allow for a less restrictive monetary policy path in those regions. In this context, global recession risks have moderated, and the global risk appetite has increased. Consequently, in recent weeks the Colombian peso has appreciated significantly, and TES interest rates have dropped. As of January 24, 2023, the risk premium (CDS) continued to decrease and reached 261 bps, while the Colombian peso showed a tendency to appreciate.[20] Should this trend materialize, inflationary pressures from the exchange rate could be lower than those included in the macroeconomic outlook.

19 According to J.P. Morgan Emerging Market Currency Index (EMCI), emerging economies' currencies appreciated 2.1 % in November and 2.7% in December with respect to their average value recorded in October. In contrast, the Colombian peso depreciated monthly by nearly 4% in November, while it appreciated by nearly 3% in December.

20 Between January 1 and January 23, 2023, the USD:COP market exchange rate fell by COP 259, reflecting an 5.4% appreciation of the Colombian peso in that period.

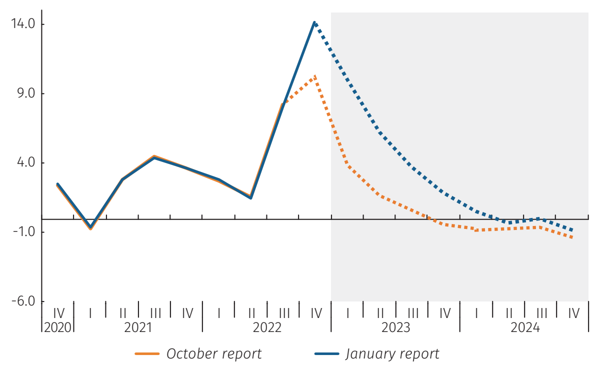
## 2.2 Macroeconomic projections[21]

### 2.2.1 Inflation

**In this report, the projection for consumer inflation over the forecast horizon was revised sharply upward, although it is still expected to remain on a path of gradual convergence towards the target as of the first quarter of 2023, partly as a result of monetary policy tightening**. Upward inflation surprises in the fourth quarter, higher cumulative exchange rate pressures by yearend 2022, and indexation to higher inflation levels were the main factors that led to an increase in the inflation path for all of 2023 and part of 2024. For the current year, significant cumulative exchange rate pressures are expected to remain, higher than previously seen, although they should gradually ease, as suggested by the real exchange rate inflation gap (Graph 2.11). The expected decline in inflation should also contribute towards a gradual decline in international prices and costs, a phenomenon that began in the last months of 2022 and should continue in 2023. This will be accompanied by an expected increase in agricultural supply as various supply shocks that occurred in the fourth quarter of 2022 dissipate, the weather normalizes, incentives stemming from the high prices of the previous year come into force and bottlenecks in the production chains of some sectors resulting from the road blockades experience in mid-2021 are overcome. As the year progresses, the aforementioned downward pressures would be reinforced by a gradual reduction of excess demand in an environment of contractionary monetary policy. All this would allow total annual inflation to fall to 8.7% by the end of 2023, and to register 3.5% by the end of 2024 (Graph 2.12).

Graph 2.11
Quarterly RER inflationary gap a/
(Annual change, end-of-period)

(Percentage)

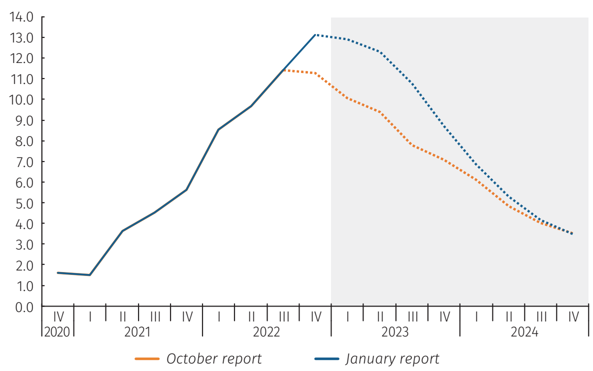



a/ The real exchange rate (RER) inflationary gap captures inflationary pressures caused by the exchange rate. Positive values imply upward inflation pressures. The gap is calculated as the deviation in the real exchange rate relative to a non-inflationary trend estimate under the 4GM monetary policy model.
Source: *Banco de la República*.

**Core inflation should gradually decline over the forecast horizon as supply shocks abate and through the expected effects of monetary policy tightening**. However, it would continue on a steeper path than that anticipated in the previous report, given the significant weight of indexation and accumulated depreciation. These factors, together with the surprises registered in several sub-baskets, would result in deferring the decline of core inflation to the second half of 2023 (Graph 2.13). A large share of the goods and some services that have significant weights in the consumer sub-basket (such as food away from home (FAH) through processed foods, tourism, and automobile insurance, among others) would continue to face direct or indirect (through costs) upward pressures associated with a higher accumulated depreciation than those considered in the previous report. These pressures occur within a framework where the output gap will continue to be positive. As the year progresses, exchange rate pressures will ameliorate and the output gap will close, which, together

Graph 2.12
Consumer Price Index (CPI)
(Annual change, end-of-period)

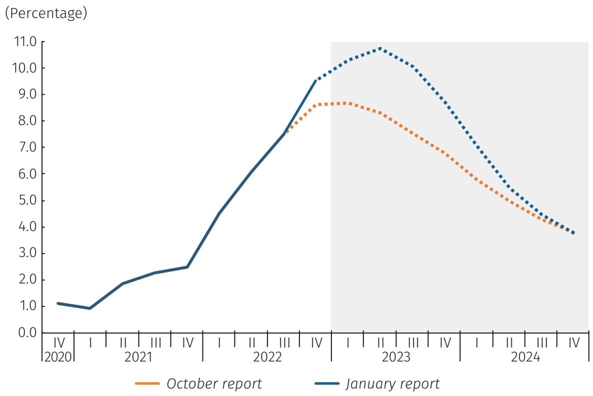
(Percentage)




Source: DANE, calculations and projections by *Banco de la República*.

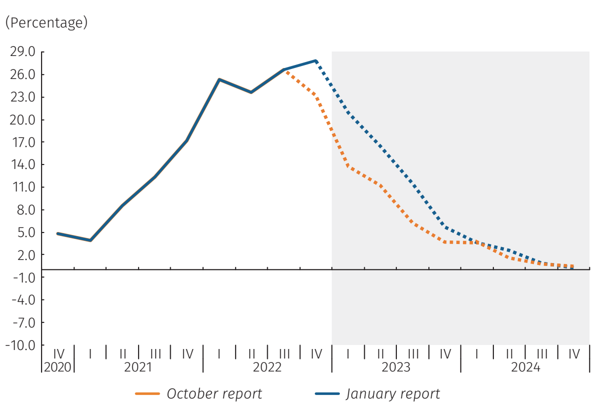
21 Projections assume active monetary policy wherein *Banco de la República's* monetary policy interest rate is adjusted to guarantee compliance with the inflation target.

Graph 2.13
CPI excluding food and regulated items
(Annual change, end-of-period)




Source: DANE, calculations and projections by *Banco de la República*.

Graph 2.14
CPI for foods
(Annual change, end-of-period)



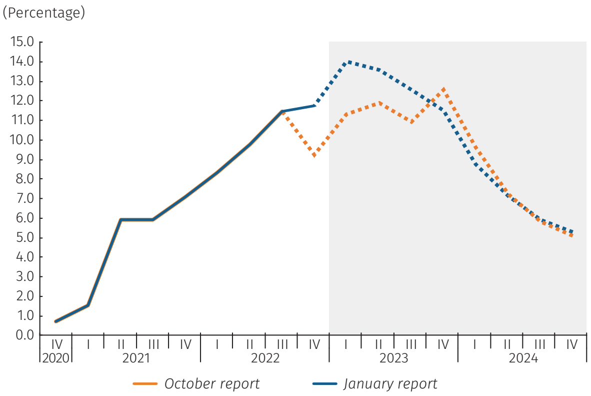

Source: DANE, calculations and projections by *Banco de la República*.

with the expected decrease in external prices and costs, will allow the upward trend of core inflation to recede. Within this sub-basket, the annual change in the CPI for services would only begin to decline at the end of 2023 and would follow a steeper path than expected in the previous report, given the index weighting and the increase in the minimum wage, the latter being somewhat higher than that foreseen in the October report. Added to this is the upward shock expected at the beginning of the year resulting from the full reinstatement of indirect taxes on airline tickets, services associated with tourism and food away from home. The path of the annual change in the CPI for goods was revised upward due to accumulated depreciation; however, it is expected to decline as of the start of the year as exchange rate pressures should begin to ease and the shocks associated with the reversal of indirect taxes and VAT-free days, which twelve months ago caused considerable increases in this sub-basket, should fade. Given the above, core inflation (without food or regulated items) at the end of 2023 is expected to fall to 8.7%. By 2024, this indicator should continue the desired convergence path towards the target, assisted by the complete reversal of supply shocks, the total decrease of excess demand and the re-anchoring of inflation expectations to the target, largely due to the role of monetary policy. By the end of the year, core inflation is forecast at 3.8%.

**The path for the annual variation of the CPI for food was revised up given the upward surprises observed at the end of 2022. However, it is still expected to decline as of the first quarter of 2023 as supply and exchange rate shocks are overcome.** The higher accumulated depreciation of the Colombian peso and impacts on certain food supplies, partly due to prolonged excess rainfall, support the higher projected path for the annual change in the CPI for food. This report estimates that during the first quarter of 2023, these prices will continue to be affected by weather-related supply shocks. Additionally, the minimum wage adjustment was above that forecast in the previous report. Nevertheless, a substantial decline is still expected for the CPI for food indicator throughout the year, particularly owing to the role played by lower international prices and costs, the dilution of exchange rate shocks and the recovery of the domestic supply of perishable foodstuffs. The latter should occur as weather conditions stabilize and the high domestic prices that have been observed during the past few months encourage investment in the sector. Consequently, it is expected that the annual change in the IPC for food at yearend 2023 will be 5.7% and at yearend 2024 0.3% (Graph 2.14).

**Changes in the CPI for regulated items would continue to be contingent on significant upward pressures due to the 2023 indexation and would largely depend on the authorities' decisions regarding fuel and electricity prices**. The forecast for annual CPI changes for this sub-basket was revised up for the

Graph 2.15
CPI for regulated items
(Annual change, end-of-period)

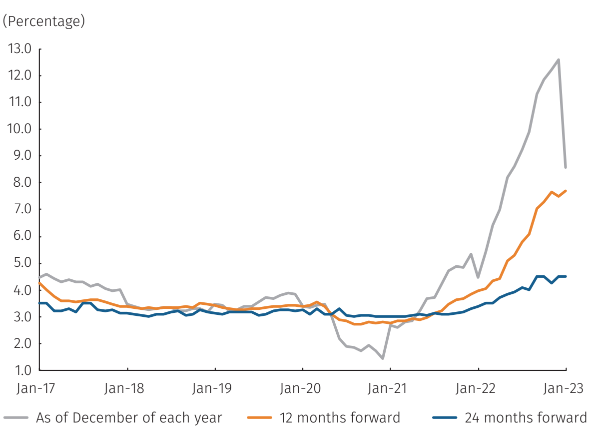



Source: DANE, calculations and projections by *Banco de la República.*

first three quarters of 2023 due to higher upward pressures from the high levels reached by the CPI, the PPI, the exchange rate and the international prices of some raw materials by the end of 2022, all of which affect the tariff formulas for public utilities and other regulated items. Furthermore, after assimilating the January COP 400 increase in the price of gasoline, the CPI for fuels would continue with adjustments very similar to those foreseen in the previous report. Regarding the CPI for electricity, the expected adjustments take into account the tariff agreements between the Government and several service providers. Because exchange rate pressures would ease in the medium term, the international price of oil would remain stable and consumer inflation would begin to ease, the forecast for 2024 anticipates a significant drop in the annual change of the CPI for regulated items. Thus, annual changes of this sub-basket would continue to rise until the first three months of 2023 (14.0%) but, as the second quarter of the year, would begin to decline to end 2023 at 11.5%, and yearend 2024 at 5.3% (Graph 2.15).

**Compared to October's figures, one-year ahead inflation expectations increased once again, while two-year ahead expectations remained steady, and longer-term expectations derived from breakeven inflation (BEI) decreased. Nevertheless, they remain well above the target for all time horizons**. The expectations of economic analysts, obtained from the monthly survey conducted by *Banco de la República* between January 6 and 12 (Graph 2.16), suggest a year-end total median inflation expectation for 2023 of 8.6% (6.7% in the October survey) and 8.0% for inflation expectations excluding food (6.3% in the October survey). By the end of 2024, according to the survey results, these values would drop to 5.0% and 4.6%, respectively. Moreover, in said survey, the two-year ahead inflation expectation remained at 4.5%, while the five-year ahead inflation expectation increased slightly to 3.4% (3.1% in the October survey). Additionally, with information to January 20, the expectations based on public debt bonds (breakeven inflation, BEI), adjusted by the inflation and liquidity[22] risk premiums, show two-, three- and five-year ahead inflation expectations of 8.2%, 7.5% and 6.4%, respectively (8.3%, 7.7% and 6.6%, respectively, in October).

Graph 2.16
Inflation forecasts from banks and stockbrokers [a/]



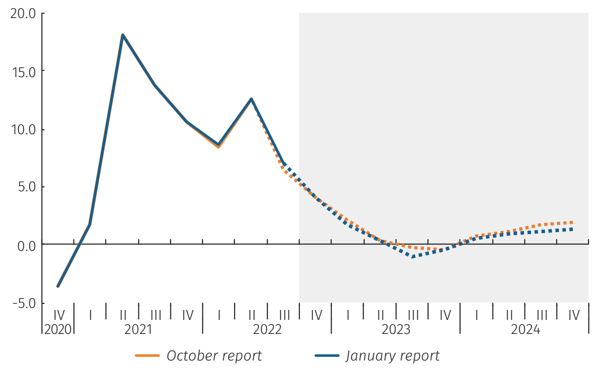

a/ Corresponds to the median of the responses of *Banco de la República*'s Monthly Survey of Economic Analysts' Expectations.
Source: DANE; calculations and projections by *Banco de la República.*

22 Inflation expectations net of inflationary and liquidity risk premiums are calculated as the difference between nominal and real rates excluding risk based on public debt markets at multiple terms (Abrahams et al., 2015; Espinosa et al., 2015). Consequently, the so-called inflationary risk premium is derived by subtracting the premium by term on the TES in UVR from the premium on the TES curve in pesos. The differences between these term premiums can reflect uncertainty over future inflation, however it can also be influenced by friction in particular markets, such as the preference of some agents to invest in certain types of bonds. Meanwhile, the liquidity component is calculated as the difference between the liquidity premium from the TES curve in pesos and the premium from the TES curve in UVR. As a result, total BEI calculated with this methodology can be disaggregated by expected inflation, the inflationary risk premium, and a liquidity component.

### 2.2.2 Economic activity

**Available economic activity indicators suggest that by yearend 2022, the Colombian economy would have entered a slower growth phase, in line with a more sustainable long-term GDP path**. This would occur after the economy reached surprising and historically high GDP levels during the third quarter, as explained in Chapter 3 of this report. For the fourth quarter of this year, available indicators suggest that economic activity would have shown a moderate growth rate, consistent with less favorable internal and external market environments resulting from inflation increases, a more restrictive monetary policy, a decline in business and consumer confidence, moderate credit growth and a slowdown in the economies of our trading partners. In this context, an annual GDP growth of 4.1% is expected (Graph 2.17) (similar to the 4.2% forecast in the October Report), which would imply a significant tempering of the rate of expansion compared to that observed in previous quarters, and levels of economic activity that would remain very similar to those recorded in the third quarter, with a quarterly growth (seasonally and calendar adjusted series) of -0.2%. On the supply side, which has the most updated information, arts and entertainment, information and communications, and construction would be the most dynamic sectors, while agricultural and livestock activities would continue to perform poorly, with lower levels than those observed a year ago. It should be noted that, although the macroeconomic forecast includes a marked slowdown in the economy, an even greater adjustment in domestic absorption cannot be ruled out. This is due to the cumulative effects of tighter external and internal fiscal conditions, among other reasons.

Graph 2.17
Quarterly GDP a/
(Annual change)



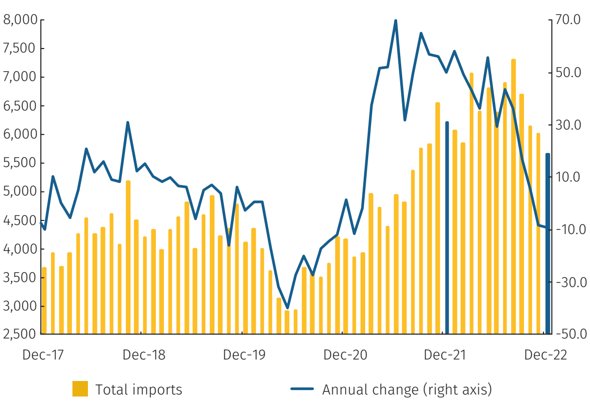

a/ Seasonally and calendar adjusted
Source: DANE, calculations and projections by *Banco de la República*.

**In the fourth quarter, total consumption is expected to expand slightly as a result of a moderation in household spending**. After recording a fall in the third quarter from the very high levels reached in the second quarter, private consumption is expected to have stabilized in the last months of the year, as suggested by various indicators. Thus, for this report, quarterly growth for private consumption of close to 0% is expected, which despite the figure implies a significant annual growth, given the continued escalation of the already high levels of spending. In particular, consumption of services would have remained dynamic, with a slight increase between quarters but with a slight slowdown as compared to previous periods. Consumption of goods, on the other hand, would have shown a decline as compared to the third quarter, with a focus on the durable and semi-durable segments. All the above is apparent in the figures such as the economic monitor indicator (ISE), retail sales, commercial bank transactions, consumer goods imports, vehicle registrations, and consumer credit disbursements. In general, the moderation of household spending would be the result of the depletion of surplus savings accumulated during the pandemic, a contractionary monetary policy by yearend 2022, the deterioration of consumer confidence and the absence of additional stimuli such as VAT-free days, among other factors. On the other hand, public spending would have continued to grow on a quarterly basis, largely driven by salary expenses associated with public hiring and by an increase in spending on education (as a result of the return to face-to-face classes). Given the above, total consumption is expected to increase by 4.3% in annual terms and by 0.4% in quarterly terms.

**For the final months of the year, investment levels are expected to decline following the high levels reached in previous quarters**. This decline would primarily have affected investments in machinery and equipment, as suggested by preliminary import figures as of December, which point to lower spending on transportation equipment. It should be noted that, despite this reduction, the amounts of these investments would have remained elevated and not very far from the historical highs observed in previous quarters. The level of investment in construction is expected to somewhat improve over those observed in the third quarter, mainly as a result of civil works, despite still reporting levels far below those before the pandemic. Housing investment should remain at the relatively high levels reported for the previous quarter. Thus, notwithstanding quarterly decrease, the gross fixed capital formation would have continued to show a double-digit annual growth rate.

**The slight growth of consumption and the decrease in investment would lead to a moderation in domestic demand quarterly growth.** In contrast with the significant dynamism observed since the middle of last year, domestic demand would not have grown in quarterly terms. This suggests that the economy is entering a growth pace more in line with both its long-term sustainable values and inflation converging towards target. In any case, as is the case with other GDP components, the high levels of domestic demand achieved in the third quarter guarantee significant annual growth, which would remain higher than the average of aggregate economic activity.

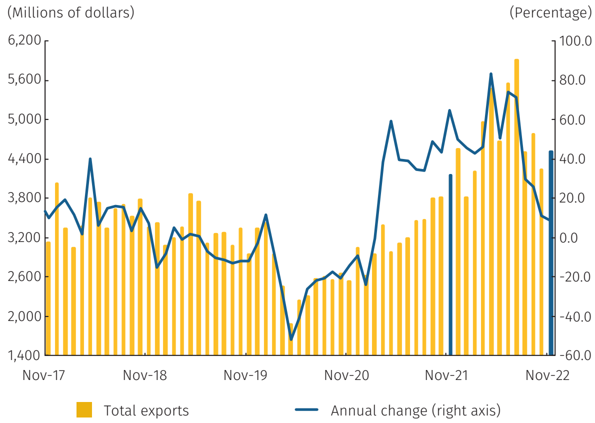
Graph 2.18
Total imports of goods (CIF)
(Monthly)




Source: DANE and DIAN (preliminary foreign trade data), calculations by *Banco de la República*.

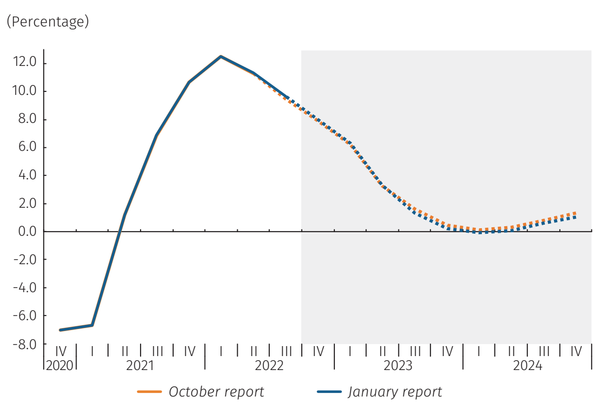
**The slowdown in domestic demand would have led to a reduction in imports in constant Colombian pesos, which would have subsequently allowed for a certain degree of correction in the trade deficit.** Preliminary figures as of December suggest that the decline in imports in the fourth quarter was mainly the result of a decrease in the purchase of raw materials and capital goods (Graph 2.18). Thus, the import levels would have been close to those recorded in the second quarter, which in any case continue to be high and significantly above those recorded during the pre-pandemic period. Concerning exports, the figures observed as of November point to a slight fall in this component, although less than that of imports (Chart 2.19). This behavior would be explained by a decline in the international sales of ferronickel, coffee, coal and oil. Some

Graph 2.19
Total exports of goods (FOB)
(Monthly)




Source: DANE and calculations by *Banco de la República*.

Graph 2.20
GDP, four-quarter cumulative [a/]
(Annual change)



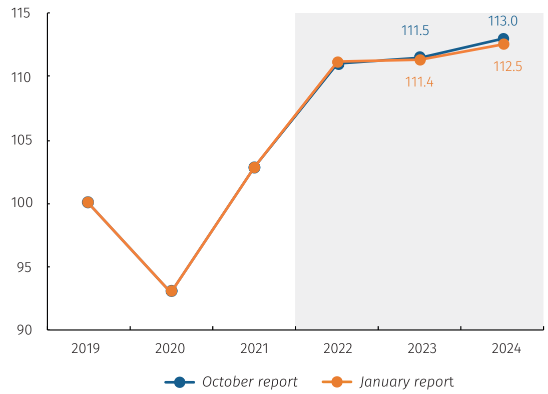

a/ Seasonally and calendar adjusted
Source: DANE, calculations and projections by *Banco de la República*.

moderation in the performance of non-traditional exports is also expected for the end of the year. In contrast, exports of services would have continued to show significant dynamism, driven by non-resident tourism. As a result of the above, the external deficit in constant pesos would have shown a certain degree of correction, and thus its contribution to the annual variation of GDP would have been less negative.

**Given the above, this report forecasts GDP growth of 8.0 % for the entire year, a figure similar to that estimated in the previous report (7.9%) (Graph 2.20).** This correction would be mainly the result of the surprise growth recorded for the third quarter of 2022, which would have been instigated by a better domestic demand dynamic than expected in the October report, in particular the boost in housing investment. With this growth, total GDP for 2022 would be close to 11% above that of 2019. These levels of economic activity have been buoyed by significant increases in macroeconomic imbalances, including the widening of the external deficit. In addition, significant disparities remain in terms of supply growth, with productive sectors such as construction and mining still reporting performances below pre-pandemic levels.

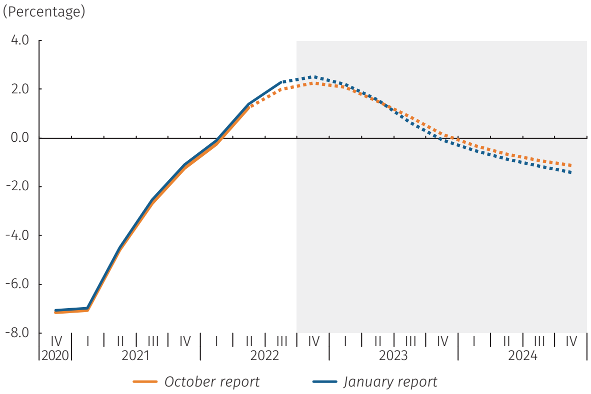
**For the current year and 2024, the Colombian economy will experience relatively low expansion rates, which will allow it to gradually reduce excess demand and move towards levels more compatible with meeting long-term inflation targets**. The central forecast scenario contemplates less comfortable external conditions for the present and coming year, with high financing costs and a high country-risk premium. In addition, trading partner growth in 2023 would be less than that contemplated in past reports, given high external inflation and a more restrictive global monetary policy. Nevertheless, it is assumed that the Colombian economy would continue to gain access to external financing. On the domestic front, this is reflected in more restrictive financial conditions, coupled with lower consumer confidence in a high inflation environment and less attractive growth prospects. These factors would all lead to a drop in total consumption levels, mainly for the first semester of 2023, and stunted growth for the rest of the forecast horizon. Investment would also lose much of its current dynamism, with small setbacks throughout 2023, yet maintaining higher levels than those estimated in the previous report. In 2023, the civil works component would represent a positive contribution to investment, primarily driven by advances made in local and regional government programs. Given the above, a significant slowdown in economic growth is still expected as compared to that observed in 2021 and 2022. Thus, a 0.2% GDP growth is forecasted for 2023 with a slight upturn for 2024, with a 1.0% growth (compared to the 0.5% and 1.3% contemplated in the October report, respectively) (Graph 2.21). It is worth noting that there is still substantial uncertainty surrounding these estimates due to internal and

Graph 2.21
GDP levels




Source: calculations and projections by *Banco de la República*.

Graph 2.22
Output gap a/
(Four-quarter cumulative)




a/ The historical estimate of the output gap is calculated as the difference between observed GDP (four-quarter cumulative) and potential GDP (trend; four-quarter cumulative) from the 4GM model; for the forecast, it is calculated as the difference between the technical staff's GDP estimate (four-quarter cumulative) and potential GDP (trend; four-quarter cumulative) from the 4GM model.
Source: calculations and projections by *Banco de la República*.

external risks that may affect the fundamental factors implicit therein.

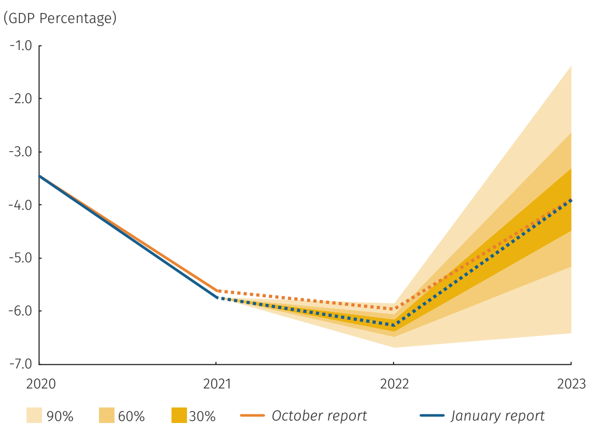
**Given the recent behavior of the labor market and the economic activity forecasts contemplated in this report, the unemployment rate is expected to increase during 2023, averaging 11.3% (in a range between 9.8% and 12.9%).** The information provided by the General Integrated Household Survey (GEIH) shows a labor market that registers steady employment growth. However, in recent months, no change has been observed in employment, which corresponds to very different dynamics in urban and rural employment levels; the former has continued to report growth, while the latter has shown a contraction. Furthermore, in terms of employment positions, the non-salaried segment has contracted in recent months, while the salaried segment continues to grow. However, other sources of information on salaried and formal employment, including those recorded for PILA pension contributors and family compensation fund affiliates, indicate a more moderate expansion and signs of stabilization. Other labor demand indicators such as the job openings rate show a rapid margin contraction, despite remaining at a high level. The domestic seasonally adjusted aggregate unemployment rate (UR) has remained stable during the last few months, as a result of contractions in the urban workforce and a slight increase in rural areas, consistent with employment behavior. Based on information up to November, in a moving quarter, the domestic aggregate UR averaged 10.8% (see Chapter 3). Based on these dynamics and the macroeconomic scenario foreseen in this report, the technical staff estimated that the unemployment rate will continue to rise during 2023. In particular, the annual domestic aggregate could average between 9.8% and 12.9%, with 11.3% as the most likely value. In urban areas, the annual average could fall between 9.4% and 12.5%, with 11% as the most likely value. These estimates suggest a negative urban unemployment gap, which would imply a tighter labor market that could be generating inflationary pressures. However, the easing of these pressures is expected for early 2023, given the economic slowdown anticipated (see the January 2023 Labor Market report).

**Strong GDP growth in 2022, particularly in private consumption, accompanied by increases in inflation, results in an estimated positive output gap, which consequently indicates that the economy is operating under a shortage scenario. This shortage is expected to disappear by yearend 2023 and the gap is expected to be in negative territory by 2024 (Graph 2.22).** GDP behavior, domestic demand, and the labor market as well as the upward surprises in headline inflation and the various core inflation indicators suggest that the Colombian economy is operating above its productive capacity. Thus, for 2022, this report's forecast scenario envisages a positive annual output gap of 2.5%, slightly higher than that estimated in the October report (2.3%), with potential annual output growing by 4.3%. By 2023, shortages are expected to gradually disappear, in line with tighter external financial conditions, an estimated correction in domestic demand, an expected fiscal adjustment and a contractionary monetary policy. Consequently, the annual output gap is estimated at close to zero by yearend 2023, before falling into negative territory (-1.4%) during 2024. These estimates would be consistent with potential output registering slight increases in its levels and growing at annual rates of 2.8% and 2.4%, in 2023 and 2024 respectively. It should be noted that these estimates are surrounded by considerable uncertainty due to the internal and external risks mentioned in other sections of this report.

### 2.2.3 Balance of payments

**The current account deficit for 2022 is estimated at 6.3% of GDP (USD 21,366 m), a higher figure than the 5.7% observed in 2021 (Graph 2.23).**[23] In 2022 the external imbalance is considerable and may primarily be the result of an increase in domestic demand, international prices and costs pressures, higher external debt servicing expenditures and the positive results obtained by foreign companies.[24] In particular, higher consumption could explain the boom in imported goods and services, the dynamics of which were also driven by higher international prices of producer goods, such as inputs for industry and agriculture, and fuels. The rise in foreign debt interests and high international freight rates also drove the external deficit upwards. In turn, high export prices, the increase in the number of arrivals of international tourists, and an increase in external demand for non-traditional goods, together with historically high workers' remittances, would have mitigated the expansion of the current deficit. It should be noted that in 2022, the quantities of the main traditional goods exported did not grow significantly, and exports in effect fell in certain cases, such as coffee, thus limiting export growth. Finally, the estimated deficit for 2022 was revised up from the October report (6.0% of GDP).

Graph 2.23
Annual current account a/, b/
(Four-quarter cumulative)




a/ The graph displays the probability distribution and its most likely path for 2022 and 2023. Densities characterize the balance of potential risks with areas of 30%, 60% and 90% probability around the central forecast (mode), using primarily as reference the densities from the *Patacon* model.
b/ The probability distribution is derived from the forecasting exercise of the January report.
Source: *Banco de la República.*

23 For the first three quarters of 2022, the current deficit represented 6.4% of GDP. High net factor income outflows and trade disbursements may explain this result. For the fourth quarter, a current account deficit of close to 5.9% of GDP is expected, which represents a correction compared to what has been observed so far this year. The lower deficit at the end of 2022 would be due to the effect of a deceleration in economic activity regarding current expenditures and an increase in income from remittances.

24 In the current account aggregate, the pressures for a larger external deficit arise from those companies with FDI focusing on the domestic market. In contrast, the profits of the mining and energy sectors are more than offset by the external revenues they generate through exports.

**In 2023, the current account deficit would be reduced to 3.9% of GDP (USD 13,595 m), in line with the expected domestic demand adjustments (Graph 2.23)**. Restraint is expected regarding economic activity, in particular, the adjustment of total consumption from 2022 levels would be reflected in the reduction of the country's external outflows, especially imports and the profits of foreign companies operating in the local market. There would also be a resultant decrease in external outlays due to the reduction in international prices of raw materials, which would affect the generation of profits in the extractive sectors, such as mining and oil, and would reduce the nominal value of imports of inputs and fuels. Moreover, lower payments for the transportation of goods and positive performance of international tourism would contribute to the correction of the external imbalance. On the other hand, the current deficit estimate for 2023 considers some dynamics that would limit a more pronounced annual correction. Specifically, a fall in traditional exports is envisaged, given lower prices and relatively low production levels of the main raw materials (such as oil, coal and coffee), higher foreign debt interest, a deceleration in trading partner growth, and a fall in income from workers' remittances given the expected downturn of the labor market in the countries where migrants reside. The estimated balance of payments incorporates a moderate annual reduction in the terms of trade in 2023 as a result of a greater decrease in the prices of exported products compared to imported products. From a macroeconomic balance outlook on savings and investment, the adjustment of the current account deficit would be consistent with the reduction of the fiscal imbalance. It should be noted that uncertainty surrounding local and global financial and economic conditions remains high, which implies enduring risks in external account forecasts.

**In 2023 the country would retain access to external financing, albeit under tighter financial conditions and high volatility in capital markets**. In 2022, the increase in international benchmark interest rates and the higher perception of local risk resulted in higher borrowing costs, conditions that would continue throughout this year, particularly due to expected increases in external interest rates. However, forecasts indicate that capital flows would continue to finance the country's external imbalance. In particular, FDI would continue to finance a significant portion of the current deficit. However, the levels seen in 2022[25] are not expected to continue in 2023 due to the slowing pace of economic activity, the expected decrease in hydrocarbon prices and the high baseline resulting from one-off operations that occurred during the first quarter of 2022.[26] As for the remaining capital flows associated with the private sector, during 2022 capital inflows from external indebtedness were observed, which were subsequently offset in part by the incorporation of foreign assets by residents. By 2023, the private sector is expected to increase its net foreign assets in instruments other than FDI. Furthermore, the public sector, which in 2022 increased its foreign liabilities to obtain financing, would continue to contribute to foreign funding during 2023, albeit at a slower pace, as indicated by the outlooks for the reduction of the country's fiscal deficit.

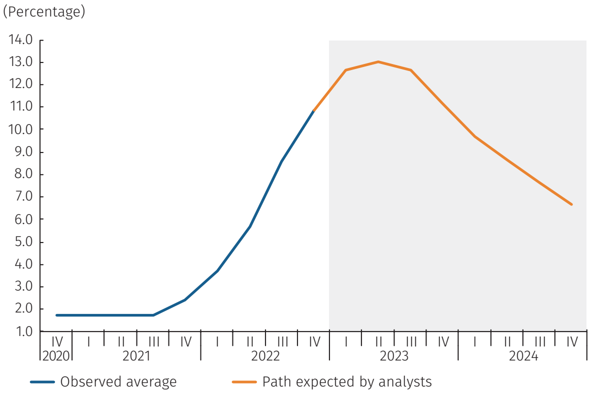
### 2.2.4 Monetary policy and interest rates expected by analysts

**The median analyst expectation for policy rates is 12.7% for the first quarter of 2023 (median of 13% for the meeting of January) and 11.2 % for the final quarter**

25 In 2022, the increase in FDI was associated with economic growth, high oil and coal prices, and one-time capital inflows for the acquisition of Colombian companies.

26 In particular, capital inflows for the purchase of Nutresa and Grupo Sura shares were obtained in the first quarter of 2022 and were accounted for as FDI and private sector external indebtedness.

Graph 2.24
Monetary policy interest rate: average observed quarterly, and rate expected by analysts [a/]




a/ These projections are calculated considering the quarterly average of the current rate according to the median response to *Banco de la República's* monthly survey of analyst expectations from January 2022
Source: *Banco de la República*.

**of the year (Graph 2.24)**. According to *Banco de la República's* monthly survey of analyst expectations carried out at the beginning of January, the median responses suggest that the current policy interest rate during the first quarter of 2023 would stand at 12.7%, would reach a maximum of 13% in the second quarter of the year, and would close 2023 at 11.2%. For the last quarter of 2024, analysts estimate an average rate of 6.7%. In the forecast horizon contemplated in this report, cumulative exchange rate pressures, a positive output gap in 2023 and the persistent supply shocks that have affected inflation result in a higher inflation path forecast than in the previous report, which is consistent with the increases in policy rates established by *Banco de la República's* Board of Directors. These increases and the future path of interest rates are also consistent with a gradual convergence of inflation toward its monetary policy target. It is worth noting that the analysts' inflation forecast for the end of 2024 is higher than that of the technical staff. Accordingly, the technical staff expects an interest rate path that is higher on average (eight quarters of the forecast horizon) than that expected by the market in the January 2023 survey.

### 2.3 Balance of macroeconomic risks

**Although several of the upside risks to inflation have materialized and have been factored into forecast paths, uncertainty associated with idiosyncratic factors facing the Colombian economy persists.** This report reflects the continued high levels of uncertainty surrounding several factors that have affected inflation estimates. Indexation to higher inflation rates, higher degrees of indexation, the risk of an increase in some regulated product prices (fuels and public services) and food, given the recent shocks that could affect agricultural supply, are some of the factors worth noting. Additionally, there are short-term downward biases in economic activity and uncertainty about the speed and intensity at which the Colombian economy would decelerate.

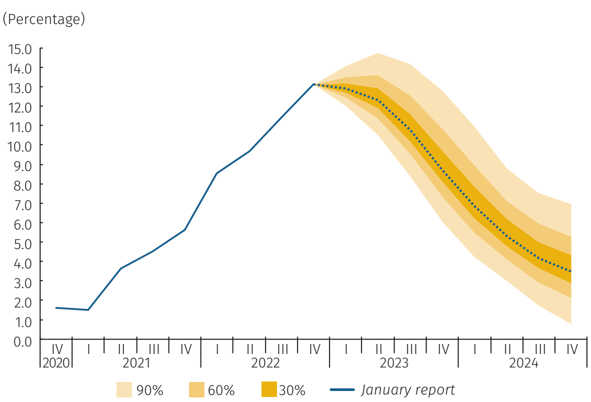
**Risks stemming from changes in international financial conditions, commodity prices and global economic activity are at the core of external uncertainty in the predictive density (PD) exercise,[27] although to a lesser extent than in the previous report**. The balance of risks considered in the forecast horizon includes factors including high uncertainty regarding the Fed's interest rate decisions, the probability of lower oil prices than those contemplated in the central scenario, a high-risk premium volatility and the possible weakening of global economic activity during 2023. These factors generate upward biases

27 Technical details on the construction of the balance of risks through the exercise of predictive densities can be found in the paper "Characterization and communication of the balance of risks of macroeconomic forecasts: a predictive density approach for Colombia" (Méndez-Vizcaíno et al., 2021) and in Box 1 of the July 2021 Monetary Policy Report.

in the uncertainty intervals of inflation paths, and downward biases in terms of economic activity. However, given the observed drop in inflation in the United States and the recent improvements in Colombia's financial conditions, these risks are now more balanced.

**The PD exercise includes high levels of uncertainty and an upward bias in inflation; however, the materialization of risks has led to a more even-keeled balance than in the October report**. Uncertainty surrounding the effects of indexation on items such as food away from home prices and rents is expected to remain high and with a positive bias, particularly in a scenario in which the output gap is positive and may close over the course of 2023. On the other hand, the possibility that exchange rate pressures resulting from external conditions will continue to affect the basket of goods remains. Substantial uncertainty continues to affect food basket inflation, with an upward bias, the risk factors of which are associated with exchange rate pressures and supply shocks. The regulated products basket assumes risks associated with greater adjustments in fuel prices and some utility rates. Given the above, the projected PD for headline inflation in the forecast horizon shows an upward bias (Graphs 2.25 and 2.26).

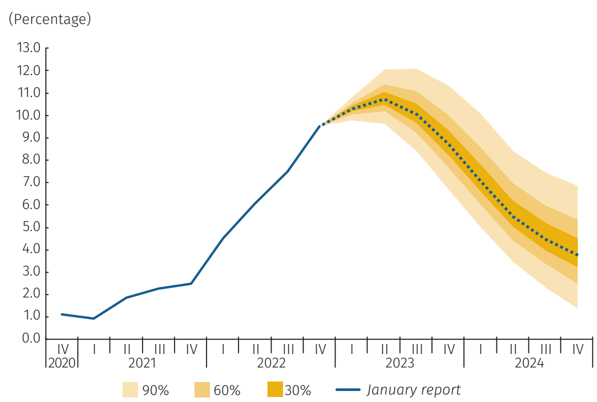
Graph 2.25
Consumer price index, predictive density [a/, b/]
(Annual change, end-of-period)




| | 1Q 2023 | 4Q 2023 | IVQ 2024 |
|---|---|---|---|
| Mode | 12.9 | 8.7 | 3.5 |
| < Mode | 55% | 62% | 57% |
| | Intervals | | |
| <2 | 0.0% | 0.0% | 15.9% |
| 2 a 3 | 0.0% | 0.0% | 16.7% |
| >3 | 100.0% | 99.8% | 67.2% |

a/ The graph displays the probability distribution and its most likely path on an eight-quarter forecast horizon. Densities characterize the balance of potential risks with areas of 30%, 60% and 90% probability around the central forecast (mode), using a combination of densities from the *Patacon* and 4GM models.
b/ The probability distribution is derived from the forecasting exercise of the January report
Source: DANE; calculations and projections by *Banco de la República*.

Graph 2.26
CPI excluding food and regulated items, predictive density [a/, b/]
(Annual change, end-of-period)



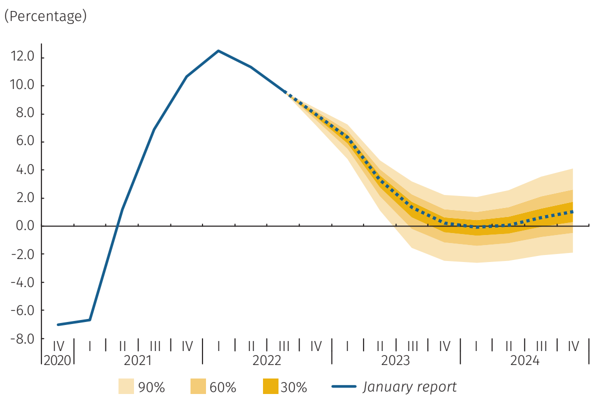

| | 1Q 2023 | 4Q 2023 | IVQ 2024 |
|---|---|---|---|
| Mode | 10.3 | 8.7 | 3.8 |
| < Mode | 50% | 59% | 57% |
| | Intervals | | |
| <2 | 0.0% | 0.0% | 10.8% |
| 2 a 3 | 0.0% | 0.0% | 15.3% |
| >3 | 100.0% | 99.9% | 73.7% |

a/ The graph displays the probability distribution and its most likely path on an eight-quarter forecast horizon. Densities characterize the balance of potential risks with areas of 30%, 60% and 90% probability around the central forecast (mode), using a combination of densities from the *Patacon* and 4GM models.
b/ The probability distribution is derived from the forecasting exercise of the January report
Source: DANE, calculations and projections by *Banco de la República*.

**The PD exercise captures downward biases in economic activity resulting from tighter local financial conditions amid high uncertainty surrounding a consumption slowdown.** In the risk assessment there are several factors that continue to generate downward biases in both GDP growth (Graph 2.27) and the output gap (Graph 2.28). Included in these factors are those associated with a stronger adjustment in domestic demand, tighter local financial conditions needed to bring inflation closer to its target, the possibility of a slowdown in global economic activity and escalating geopolitical tensions. In this context, for 2023 and 2024, the risk to the annual output gap forecast has a negative bias.

**In summary, the balance of macroeconomic risks is characterized by a high level of uncertainty, with a downward GDP growth bias for 2023, as well as an upward inflation bias over the forecast horizon.** Considering the above, there is a 90% probability that headline inflation would lie between 6.0% and 12.8% by yearend 2023 and between 0.8% and 6.95% by yearend 2024. Core inflation would stand between 6.7% and 11.3% by the end of 2023 and between 1.4% and 6.9% by the fourth quarter of 2024, with the same degree of certainty. The probability that headline and core inflation will place below 4% during the fourth quarter of 2024 is 53% and 48%, respectively. Regarding economic activity, estimated GDP growth is between -2.5% and 2.2% for 2023 and between -1.9% and 4.1% for 2024, with a 90% probability.

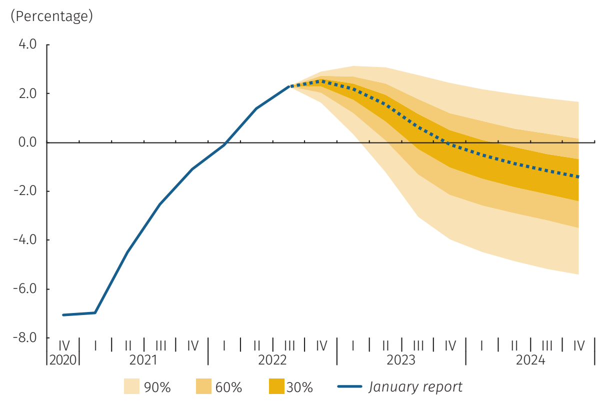
Graph 2.27
GDP, four-quarter cumulative, predictive density [a/, b/]
(Annual change)




| | 4Q 2022 | 4Q 2023 | 4Q 2024 |
|---|---|---|---|
| Mode | 8.0 | 0.2 | 1.0 |
| < Mode | 61% | 59% | 50% |
| | Intervals | | |
| <0 | 0.0% | 53.0% | 28.3% |
| 0 a 2 | 0.0% | 40.1% | 41.2% |
| 2 a 5 | 0.0% | 6.7% | 28.6% |
| >5 | 100.0% | 0.0% | 1.7% |

a/ The graph displays the probability distribution and its most likely path on an eight-quarter forecast horizon. Densities characterize the balance of potential risks with areas of 30%, 60% and 90% probability around the central forecast (mode), using a combination of densities from the *Patacon* and 4GM models.
b/ The probability distribution is derived from the forecasting exercise of the January report
Source: DANE, calculations and projections by *Banco de la República*.

Graph 2.28
Output gap, predictive density [a/, b/]
(Four-quarter cumulative)

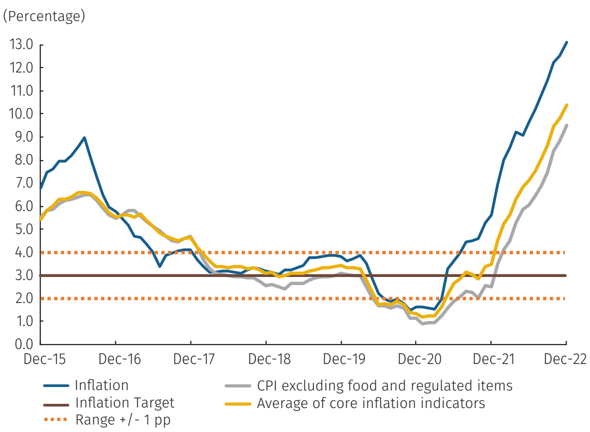



| | 4Q 2022 | 4Q 2023 | 4Q 2024 |
|---|---|---|---|
| Mode | 2.5 | -0.1 | -1.4 |
| < Mode | 65% | 63% | 58% |
| | Intervals | | |
| < -2 | 0.0% | 25.8% | 46.9% |
| -2 a 0 | 0.0% | 37.7% | 33.0% |
| 0 a 2 | 22.3% | 27.9% | 15.8% |
| >2 | 77.7% | 8.6% | 4.3% |

a/ The graph presents the probability distribution of the forecast and its most probable path for a 8-quarter horizon. The density characterizes the prospective balance of risks with areas of 30%, 60% and 90% probability around the central forecast (mode), by combining the densities of the Patacon and the 4GM.
b/ The probability distribution corresponds to the forecasting exercise of the January Report.
Source: DANE; calculations and projections by *Banco de la República*.

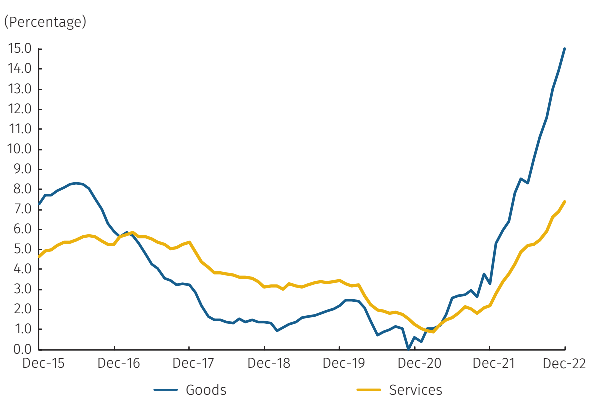
# 3. Current Economic Situation

Graph 3.1
CPI and core inflation indicators
(Annual change)




Sources: DANE and *Banco de la República*.

Graph 3.2
CPI for goods and services, excluding food and regulated items
(Annual change)




Sources: DANE and calculations by *Banco de la República*.

## 3.1 Inflation and Price Behavior

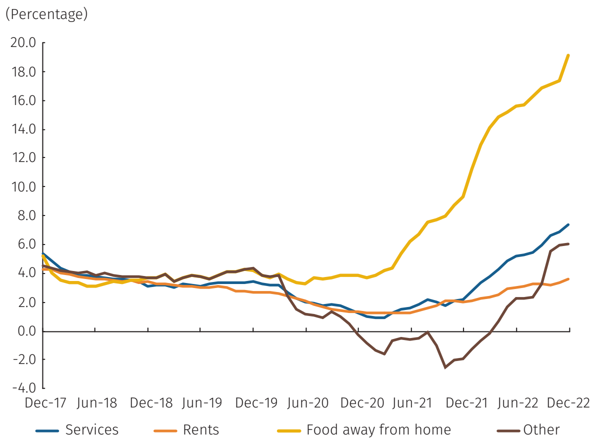
**During the fourth quarter, annual inflation continued its upward trend, surpassing expectations from previous reports, mainly driven by the exchange rate and supply shocks.** The year-end figure for 2022 closed at 13.12%, higher than that of September (11.44%) (Chart 3.1), and the highest for any December since 1998. All main sub-baskets registered increases in their annual variations, while core inflation (excluding food and regulated items) also recorded an upward trend, closing at 9.51%. The exchange rate pressures that emerged during the second semester of 2022, originating from the significant depreciation of the Colombian peso against the US dollar, became apparent and started to transfer to a wide range of goods and services, including food. These pressures surpassed certain reductions that began to be evinced in certain international prices and costs. The exchange rate pressures were reinforced by a demand that, despite initial moderation, remained at very high levels, exceeding the economy's productive capacity, thus resulting in a positive output gap. Likewise, price adjustments occurred under inflation expectations that remained well above target, which further contributed to upward pressure on prices.

**During the fourth quarter, the CPI for goods registered a sharp increase, attributable largely to the depreciation of the peso against the dollar**. The annual variation in the CPI for goods continued to follow the positive trend observed since the beginning of the year, increasing from 11.6 % in September to 15.0 % in December (Graph 3.2). This upward dynamic may be explained by the transference of the significant depreciation of the peso over the second half of the year to domestic prices. This depreciation would be overcompensating for the slower growth rate of international prices and costs, whose downward dynamic, however, has been lower than expected due to continued adverse external factors, such as the war in Ukraine. In addition, the demand for durable consumer products, especially means of transportation (vehicles, motorcycles, bicycles), has been strong. Moreover, in 2021, three VAT-free days took place during the fourth quarter[28] which implied a lower statistical comparison base and caused prices to rebound in this segment of the household basket during this period.

**The CPI for services continued its upward trend during the yearend, boosted by robust private consumption, high in-**

28 Three VAT-free days were scheduled for 2021: October 28, November 19, and December 3.

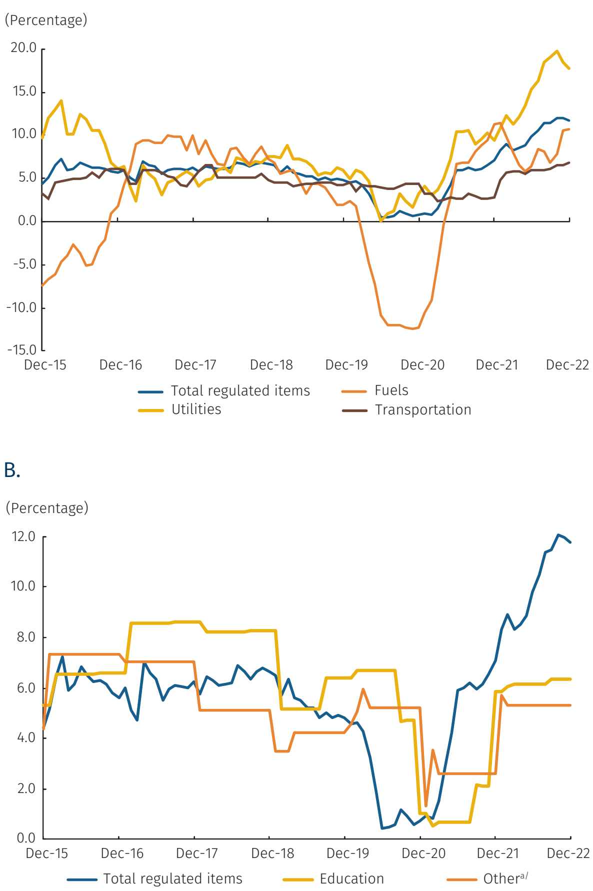
Graph 3.3
CPI for services excluding food and regulated items, and its components
(Annual change)




Sources: DANE, calculations by *Banco de la República*.

Graph 3.4
CPI for regulated items and its components
(Annual change)

A.



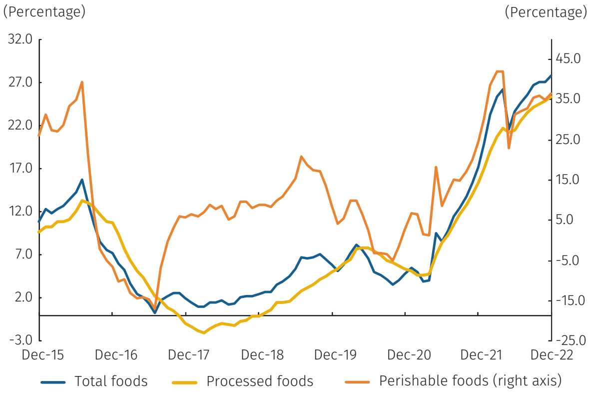

a/ Includes moderated EPS quotas, administrative certificates and documents, and professional fee payments
Sources: DANE, calculations by *Banco de la República*.

**dexation, and strong wage increases**. In December, the annual price adjustment reached 7.4%, which is higher than the figure observed in September (5.9%) (Chart 3.3). Rent, which tends to incorporate prior inflation increases at a slow pace, registered the lowest annual growth rate in December at 3.6% (Chart 3.3). Food away from home (FAH) was the main driver of the increase in the services sub-basket, which by the end of the fourth quarter recorded an annual variation of 19.1%, a figure that surprised once again to the upside. The significant cumulative growth in 2022 in the prices of food, public services, and the minimum wage has contributed to the strong and persistent upward trend of the food away from home component.

**Despite the government's announcement of a reduction in electricity tariffs, the annual variation of the CPI for regulated services continued to increase over the last three months of the year.** In December, this figure stood at 11.8%, which represents a higher rate than that observed in September (11.5%) (Graph 3.4, panel A). Notably, the CPI for public services was the only component of the CPI for regulated items that exhibited a fall in its annual growth rate between September (19.0%) and December (17.7%), a trend that reflects the significant reduction in electricity tariffs resulting from the implementation of the *Pacto por la Justicia Tarifaria* (Pact for Fair Rates) signed in September (see Box 1 of this report). However, tariffs for water and gas continued to increase during the period, reflecting higher consumer inflation (in the case of water), high domestic fuel prices, and the cumulative depreciation of the exchange rate (in the case of gas). In addition, fuels assimilated the increases decreed by the government for domestic gasoline prices aimed at reducing the gap with international prices. As a result, by yearend, this component recorded an annual increase of 10.7%, which is higher than the September figure (6.8%). Prices for the remaining items in the regulated products basket (education and others) remained stable during the fourth quarter of the year (Graph 3.4, Panel A and B).

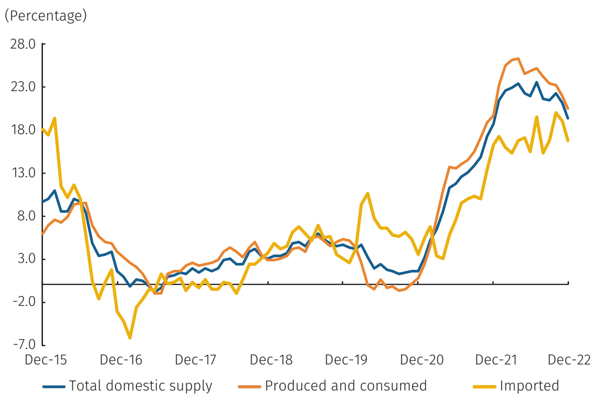
**During the fourth quarter, food prices experienced significant upward pressure due to supply, costs, and weather shocks, in addition to exchange rate pressures.** The annual variation in food prices increased from 26.6% in September to 27.8% in December (Chart 3.5). The increase in prices was observed in both perishable and processed foods, with the former experiencing an increase of 36.4 % and 25.3% respectively each December. During the last months of 2022, food prices saw significant and widespread increases across all food classes that added to the increases of previous quarters due to a combination of both domestic and external shocks. Domestically, prices were affected by the aggregated depreciation throughout the year, the delayed effect of the road blockade in mid-2021 (See Box 1 IMP October 2022), excess rainfall caused by the La Niña phenomenon, and an increase in exports, among others. Externally,

Graph 3.5
CPI for foods and its components
(Annual change)



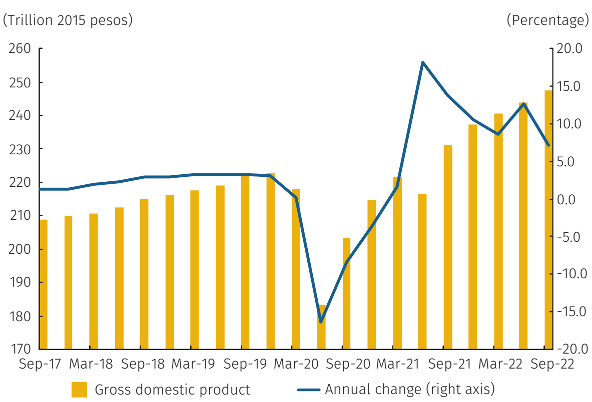

Sources: DANE, calculations by *Banco de la República*.

Graph 3.6
PPI by origin
(Annual change)




Sources: DANE, calculations by *Banco de la República*.

Graph 3.7
Gross domestic product a/
(Quarterly and annual change)




a/ Seasonally and calendar adjusted
Sources: DANE, calculations by *Banco de la República*.

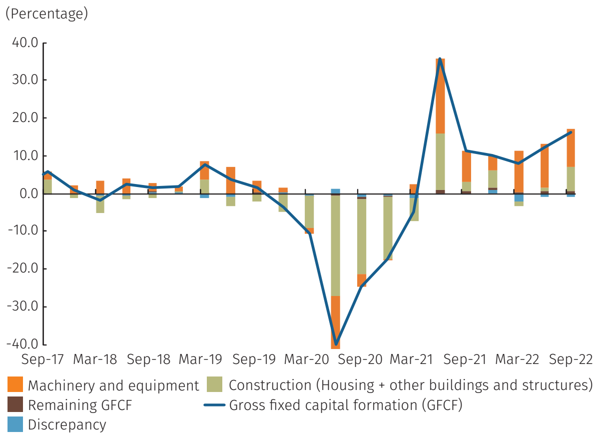
the ongoing war in Ukraine and disruptions in global logistics and transport chains have contributed to high food and agrochemical prices, despite a recent decrease. Additionally, food sovereignty policies and extreme droughts in some countries have limited the global supply and flow of food.

**During the last months of the year, the increase in producer inflation came to a halt due to the domestic component.** The annual change in December's domestic supply PPI was 19.4%, which is lower than what was observed in September and December 2021 (21.4% and 18.6% respectively). Such levels, which are close to or above 20%, have not been observed since 1992 (see Graph 3.6). The contraction in producer inflation in the fourth quarter was mainly due to the local component of the PPI, which moderated its annual growth from 23.3% in September to 20.5% in December. Meanwhile, the annual price adjustment of the imported segment of the PPI (16.8%) remained unchanged from September. Within the local component, there were lower price adjustments across the agricultural, mining, and industrial sectors. Specifically, there were lower adjustments in the prices of citrus, cassava, coffee, fossil fuels extraction, and metallurgical products. Despite the lower growth rate of producer inflation in the last months of 2022, it still maintains a very high level. This can be explained by external factors, such as the increase in the price of energy products and raw materials for agroindustry caused by Russia's invasion of Ukraine, the production contraction in China, limitations on international trade by some exporting countries, and droughts in some regions of the world. Additionally, various idiosyncratic shocks have contributed to maintaining high producer inflation. These include adverse agricultural cycles, excessive rainfall, higher agricultural exports (fruit and beef), and even persistent damage to agricultural production resulting from last year's road blockades.

## 3.2 Growth and domestic demand

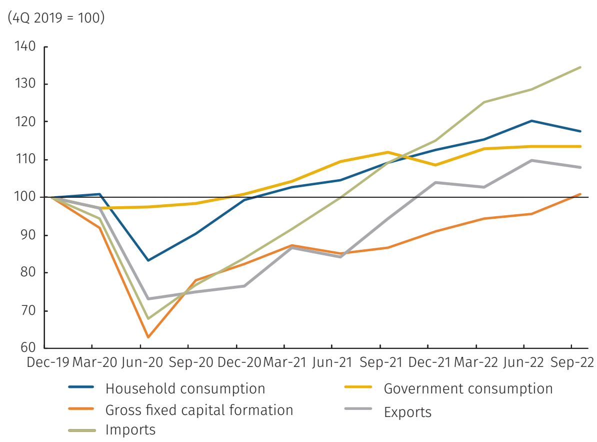
**In the third quarter, the economy continued to display a robust growth momentum, surpassing the forecast of the previous report**. The original series of the Colombian economy grew annually by 7.0%, while the seasonally and calendar-adjusted series increased by 7.1%, which was higher than the 6.4% annual growth anticipated in the October report. This implied an expansion of 6.4% in annualized quarterly terms. As a result, the Colombian economy reached high GDP levels that were 11.2% above those observed in the fourth quarter of 2019 (Graph 3.7). Growth was driven by domestic demand, supported by a labor market that continued to generate employment gains and credit that expanded at positive real rates. However, external financial conditions were tighter and the slowdown in trading partners' economies was reflected in

Graph 3.8
Quarterly gross fixed capital formation [a/]
(Annual change, contributions)



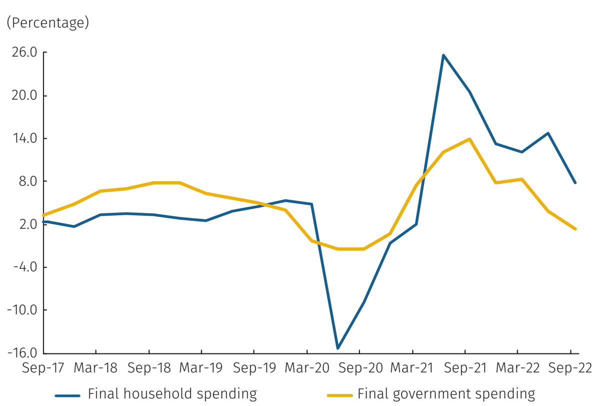

a/ Seasonally and calendar adjusted
Sources: DANE, Calculations by *Banco de la República*.

Graph 3.9
Demand components levels relative to 4Q 2019 [a/]




a/ Seasonally and calendar adjusted
Sources: DANE, calculations by *Banco de la República*.

Graph 3.10
Final household and general government spending [a/]
(Annual change)




a/ Seasonally and calendar adjusted
Sources: DANE; calculations by *Banco de la República*.

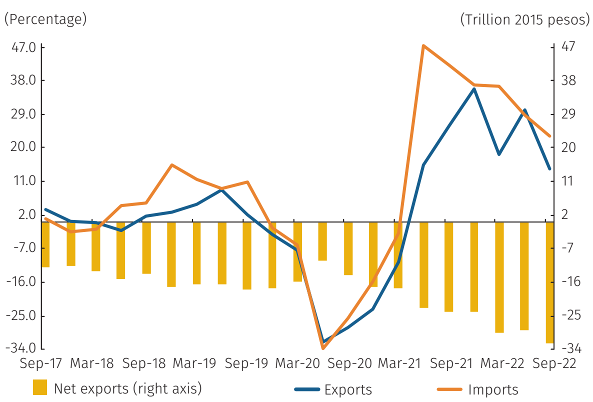
a lower contribution of exports to GDP growth. On the supply side, arts and entertainment activities, commerce, and manufacturing continued to show a strong pace of growth. The agricultural and livestock sector was the only one to register declines.

**Third-quarter growth can be explained by the good performance of domestic demand, mainly driven by investment.** Domestic demand grew at an annual rate of 9.7% and a quarterly rate of 2.1%. The most dynamic component, gross fixed capital formation, increased significantly in this period and accelerated its annual and quarterly growth (Graph 3.8), which placed it above the levels observed before the pandemic shock (Graph 3.9). The fastest growing segment of gross fixed capital formation between quarters was investment in housing, which registered a quarterly leap (24.9%) and year-on-year growth (15.3%) much higher than expected. This performance was explained by the completion of a significant number of residential works, mainly associated with public housing (VIS). Investment in machinery and equipment also increased in quarterly terms, presenting annual growth rates above 20% for the third consecutive quarter, with transportation equipment expenditure being the most dynamic component. However, investment in other buildings and structures had the most modest performance, still lagging considerably behind pre-pandemic levels and showing no sign of recovery.

**Final consumption experienced a quarter-on-quarter decline, although levels remain high.** The decline in final consumption was primarily driven by private consumption, which contracted by 2.2% compared to the second quarter. Despite this, the annual growth rate (7.8%) continued to outperform the average economic activity (Graph 3.10). Within private consumption, the most significant decline was observed in non-durable goods, while the durable segment remained stable, and services continued to increase quarter-on-quarter. Factors influencing the deceleration of private consumption include higher interest rates and inflation, which may have eroded household purchasing power. Additionally, it should be noted that durable and semi-durable consumption had reached exceptionally high levels in previous quarters due to the VAT-free days incentives. Without these incentives during the third quarter, such expenditures would likely have normalized. Regarding public consumption, this demand component remained at elevated levels compared to the previous quarter, primarily due to the favorable performance of bonuses, fees, and general expenses.

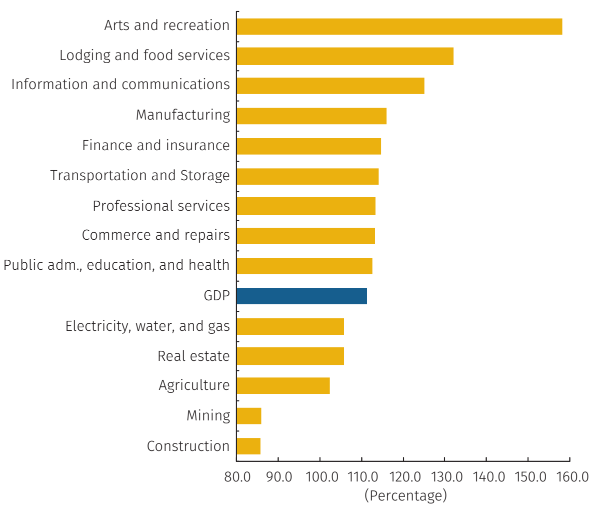
**The external deficit in constant pesos further expanded beyond the levels observed in previous quarters, due to a significant increase in imports and a modest performance of exports.** The dynamism of domestic demand, particularly investment, led to a notable increase in imports during the third quarter (23.2% annually and 4.5% quarterly). The main driver

Graph 3.11
Exports, imports, and trade balance a/
(Annual change and trillion 2015 pesos)




a/ Seasonally and calendar adjusted
Sources: DANE, calculations by *Banco de la República*.

Graph 3.12
Sectoral value added in 3Q 2022 relative to 4Q 2019 a/
(4Q 2019 = 100%)




a/ Seasonally and calendar adjusted
Sources: DANE, calculations by *Banco de la República*.

behind this growth were imports of capital goods. Conversely, exports contracted quarterly by 1.8% although they continued to expand at a significant annual rate (14.4%). The decrease in this component would have been mainly explained by the sale of basic goods to foreign markets. In contrast, the most dynamic sectors were once again non-traditional exports and services, especially non-resident tourism. Given the above, a larger trade deficit in constant pesos was recorded in the third quarter compared to the first semester of the year (Graph 3.11), reaching historically high values, while its contribution to the annual GDP change remained negative.

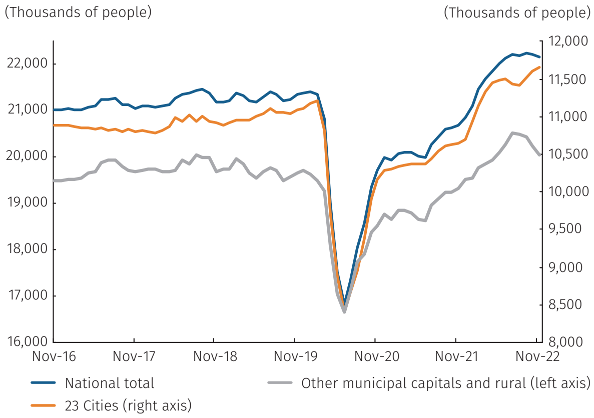
**Except for the agricultural sector, major supply activities recorded positive annual growth, with notable results in art and entertainment activities, and building construction.** During the third quarter of 2022, secondary activities (manufacturing and construction) recorded better-than-expected results than those stated in the October report. The manufacturing industry maintained its solid growth pattern, as observed since mid-2021, and construction also showed improvement, driven by increased residential construction mainly in the public housing segment. However, construction levels remained significantly lower than those in the fourth quarter of 2019. Tertiary activity performance (services), in particular art and entertainment activities, is worth noting, with an annual growth of 37% driven by the strong dynamics of gambling and online gaming, as well as the boost from large-scale concerts and local festivals held during that period. The trade, transportation, and lodging sector also recorded quarterly gains, primarily driven by transportation activities associated with domestic and international air travel. On the other hand, the lodging and food services sector experienced a quarterly setback but remained 32% higher than before the pandemic (Graph 3.12). In contrast, primary activities (agriculture and mining) underperformed expectations, mainly due to the adverse effects of negative weather conditions on coffee production and coal extraction.

## 3.3 Labor market[29]

**Recent labor market information shows growing year-on-year employment dynamics, despite the relatively stable levels observed in recent months.** In the rolling quarter ending in November, the results of the Integrated Household Survey (GEIH) show annual employment growth of 7.1%, which equals 1.5 million new jobs. However, in recent months, employment has remained stable, as employment growth in urban areas is offset by contractions in rural areas. Specifically, between October and November, changes in employment in both areas were 0.4% and -1% respectively (Graph 3.13). Annual employ-

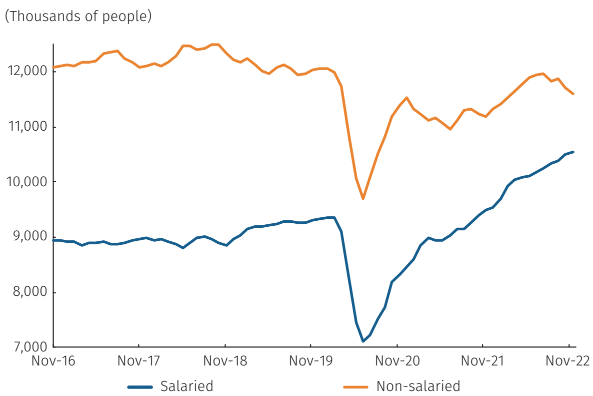
29 For a more detailed analysis of the labor market, we invite you to consult *Banco de la República's* Labor Market report, available at https://www.banrep.gov.co/es/reporte-mercado-laboral

Graph 3.13
Employed population by location



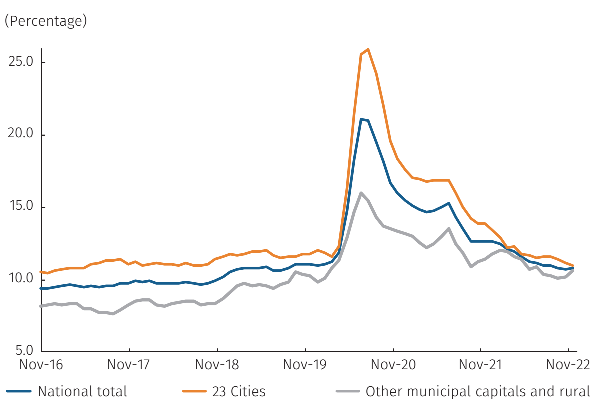

Note: corresponds to rolling seasonally adjusted data
Sources: DANE (GEIH), calculations by *Banco de la República*.

Graph 3.14
Jobs by type of employment: national total




Note: corresponds to rolling seasonally adjusted data
Sources: DANE (GEIH), calculations by *Banco de la República*.

Graph 3.15
Unemployment rate by location




Note: corresponds to rolling seasonally adjusted data
Sources: DANE (GEIH), calculations by *Banco de la República*.

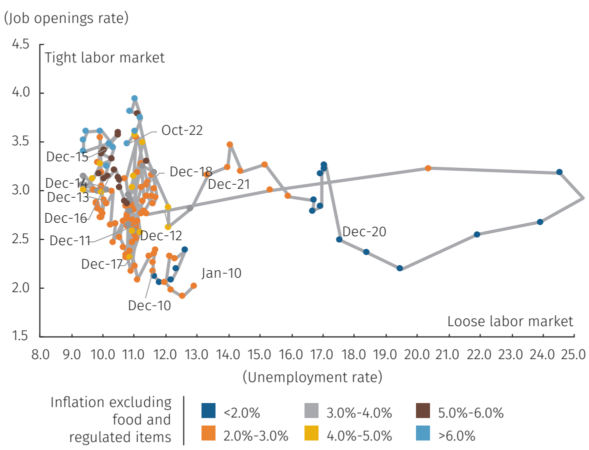
ment change by sector in November was primarily driven by strong performances in trade and lodging, manufacturing, and recreation and other services, which collectively contributed 5.1 percentage points to the total annual employment change for said month. Alternatively, the agricultural sector experienced recent employment contractions mainly in the annual agricultural crop group, possibly due to the effects of the La Niña phenomenon, which explains the lower employment dynamics in rural areas.

**Non-salaried employment has slowed down, while salaried employment continues to grow.** In November, rolling three-month data showed divergent behaviors in the national aggregate between the salaried and non-salaried segments, with annual growth rates of 11.3% and 3.5%, respectively. Annual employment behavior has moderated between October and November 2022, with an increase of 0.6% for the salaried segment, while the non-salaried segment contracted by 1.1% (Graph 3.14). Other sources of information on salaried and formal employment, such as pension contributions in the Comprehensive Contribution Settlement System (PILA) and the records of affiliates to family compensation funds (CCF), also indicate an expansion of the salaried employment sector, albeit at a more moderate pace, and a possibility of it leveling off. The growth of salaried and formal employment, along with the slowdown in the informal segment, has driven the recent decline in the informality rate. For the rolling quarter ending in November, this national indicator stood at 58.1%, remaining at historic low levels.

**The national unemployment rate has tended towards stabilization**. In November, the rolling three-month unemployment series reached 10.8%, with an annual contraction of 1.9 percentage points. However, in recent months, its level has leveled off as a result of offsetting the divergent dynamics between rural and urban areas. Additionally, given the lower demand for rural labor, recent increases have been observed in the corresponding unemployment rate, which reached 10.6% in the last month. In contrast, the urban unemployment rate continued to drop, standing at 11%, as a result of better labor demand dynamics and an overall stable participation rate (Graph 3.15). The cities that presented the largest drops in annual unemployment rates were Tunja (-5.5 percentage points) and Medellin (-4.4 percentage points), while the most significant increases were recorded in Quibdó (3.8 percentage points), Ibagué (2.4 percentage points), Armenia (0.9 percentage points), Riohacha (0.3 percentage points), and Cúcuta (0.2 percentage points). As regards to unemployment by gender, the 2022 indicator for women reported better forces at work than for men. Consequently, the gender gap continued to narrow in recent months, standing at 5 percentage points in November, a lower level than that observed immediately before the pandemic.

**Demand indicators continue to show a tight labor market despite the appearance of factors that suggest an easing during 2023**. The job vacancy indexes obtained from different sources, including classified ads and hiring data from the GEIH and PILA figures, remain high, although a rapid contraction would have been observed in recent months. The job vacancies index computed from the Public Employment Service (PES) for October and November, decreased by 5% and 7%, respectively. This is consistent with the hiring expectations in *Banco de la República's* monthly Survey of Economic Expectations (EMEE), which indicates that, as of the third quarter of 2022, organizations would be tapering off their short-term plans to make changes to their workforce. The difference between those who expect to increase their workforce and those who would not stands at 2.3% after recording historically high levels of close to 20% at the beginning of 2022. The recent drop in urban unemployment rates and relatively high levels of job vacancy rates suggests, according to a Beveridge curve[30] (Graph 3.16), a tighter labor market that is consequently inflicting inflationary pressures. However, recent job vacancy behaviors and hiring expectations suggest that this could begin to ease during 2023. Labor income information from the household survey (GEIH) shows that nominal income for the salaried segment continues on an upward path at a similar rate to that of the 2022 minimum wage. Meanwhile, labor income for non-salaried workers reported a quicker upturn for the year. Consequently, the median real income of salaried workers fell annually by 3.4% and that for non-salaried workers by 6.3%, respectively.

Graph 3.16
Beveridge curve for the seven largest cities




Notes: Seasonally adjusted series, rolling quarter. GEIH Vacancy rate estimated based on hires according to Morales, Hermida and Dávalos methodology (2019).
Sources: DANE (GEIH), calculations by *Banco de la República*.

### 3.4 Financial and money market

**The transfer of increases in the monetary policy interest rate (MPR) to market interest rates continued during the last quarter of 2022. Loan dynamics showed more measured behavior yet continue to show significant increases.** The contractionary monetary policy needed to drive inflation to its 3% target has resulted in higher money market, savings, and loan interest rates. This, in an environment with tighter external financial conditions, higher country risk premiums, strong aggregate demand dynamics exceeding the economy's productive capacity, and the deterioration of the current loan portfolio and delinquency indicators. In turn, annual loan portfolio growth has slowed due to consumer loan behavior which continues to record increases well above inflation. On the other hand, sound solvency indicators were reported by credit institutions, in addition to posting profits, adequate risk coverage, and proving stress test resilience.

**Interbank, deposit, and loan interest rates continue on an upward trend within an environment of monetary policy rate**

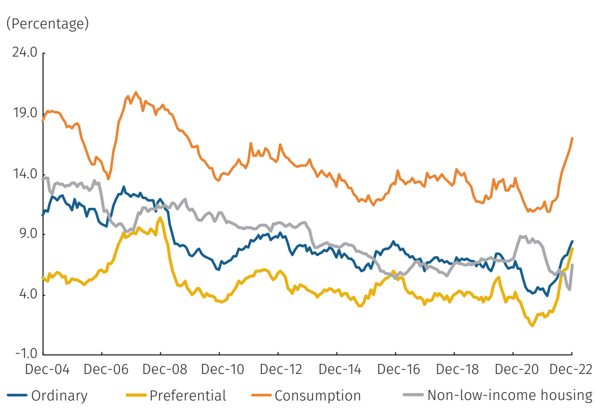
30 The Beveridge curve is a graphical representation of the relationship between unemployment and the job vacancy rate.

Table 3.1
Average monthly interest rates
(Percentage)

| | Sep-21 | Dec-21 | Jun-22 | Sep-22 | Dec-22 |
|---|---|---|---|---|---|
| **Interbank** | | | | | |
| Policy rate | 1.75 | 2.70 | 6.00 | 9.05 | 11.48 |
| Interbank overnight | 1.79 | 2.73 | 6.06 | 9.07 | 11.47 |
| BBI overnight | 1.77 | 2.72 | 6.02 | 9.05 | 11.46 |
| BBI 1-month | 1.93 | 2.96 | 6.77 | 9.74 | 11.81 |
| BBI 3-months | 2.27 | 3.36 | 7.78 | 10.61 | 12.10 |
| BBI 6-months | 2.76 | 3.96 | 8.71 | 11.25 | 12.32 |
| BBI 12-months | | | 9.78 | 11.81 | 12.20 |
| **Deposits** | | | | | |
| Savings | 0.97 | 1.19 | 2.82 | 4.43 | 5.72 |
| DTF 90-days | 2.05 | 3.08 | 7.72 | 10.99 | 13.42 |
| CDT* 180-days | 2.45 | 3.71 | 8.40 | 12.54 | 15.58 |
| CDT 360-days | 3.16 | 5.10 | 10.75 | 14.80 | 17.08 |
| CDT > 360-days | 3.68 | 7.14 | 14.37 | 17.01 | 19.15 |
| **Credit** | | | | | |
| Preferential | 4.98 | 6.00 | 10.82 | 14.86 | 18.57 |
| Ordinary | 7.34 | 8.18 | 12.62 | 16.10 | 19.27 |
| Non-public housing purchases | 9.06 | 9.40 | 12.01 | 14.63 | 17.17 |
| Public housing purchases | 10.98 | 11.55 | 13.68 | 14.89 | 16.74 |
| Personal loan consumption | 17.09 | 17.51 | 23.08 | 27.26 | 31.23 |
| Payroll loan consumption | 11.23 | 11.65 | 13.83 | 16.86 | 19.45 |
| Credit card | 23.49 | 24.47 | 28.02 | 32.49 | 39.01 |

*CDT (term deposit certificates)
Sources: Office of the Financial Superintendent of Colombia, calculations by *Banco de la República*.

Graph 3.17
Real credit interest rates
(Average monthly data deflated with CPI excluding foods)




Sources: Office of the Financial Superintendent of Colombia, calculations by *Banco de la República*.

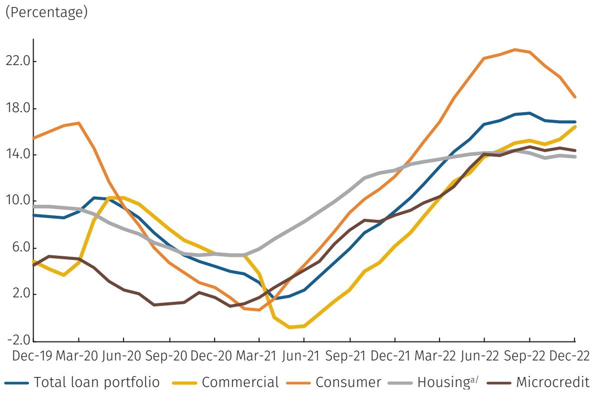
**(MPR) adjustments, higher country risk premiums, and deteriorating loan delinquency indicators (see Box 2).** Between September 2021 and December 2022, the MPR increased from 1.75% to 12.0%. During this period, the inter-bank rate (TIB) and bank benchmark index (BBI) for maturities equal to or less than three months increased and by December had reached levels similar to the MPR. In the case of longer maturities (six to twelve months), IBBs remained above the MPR, partly due to expectations of further monetary policy adjustments, although to a lesser extent than in previous reports. The higher balance of savings deposits can be explained by term deposit certificate (CDTs) behavior, which has experienced interest rate increases above those of the MPR, particularly for longer terms. The increase in the cost of funds, the rise in country risk premiums, and the deterioration in delinquency indicators for new loans, among other factors, have driven the increases in loan interest rates. During the monetary policy adjustment period, interest rate hikes for credit cards, automatic payroll deduction consumer loans, and ordinary and preferential commercial loans have exceeded the increases in the MPR. As has been customary in previous periods, the transfer of changes in the MPR to housing loan interest rates has been slower than that of other loan sectors (Table 3.1). In real terms, loan interest rates (excluding housing loans) stand above the historical average computed since 2003 (Graph 3.17).

**By yearend 2022, the annual consumer loan growth tapered off, but it keeps showing significant nominal and real increases. Outstanding housing loans exhibited relatively stable growth, close to inflation, while commercial loans ramped up.** In the fourth quarter of 2022, annual consumer loans tapered off, reaching 19.0% in December (8.2% in real terms), a decrease of 3.8 percentage points compared to September figures (Graph 3.18). This decrease was driven by a 14% quarter-on-quarter decline in disbursements and a 22% year-on-year contraction. Throughout 2022, terms were shortened for this type of loan, and automatic deduction payroll loans became more relevant.[31] Other household debt, portfolio and mortgage loans, remained relatively stable during the quarter, recording an annual growth of 13.9%.[32] Meanwhile, household debt-to-income indicators stand at historically high levels (see Box 2). Outstanding domestic commercial loans ramped up during the quarter, with an annual growth rate of 16.4% (5.8% in real terms), or 1.1 percentage points above that of September. Based on disbursement data, company demand for funding continues to focus on loans with short-term maturities, particularly on preferential loans. These operations would reflect financing needs arising from increasing production costs.

31 As of December 2022, the over five-year consumer loan portfolio represented 55% of this group (46% a year earlier) and payroll loans represented 74% (57% a year earlier).

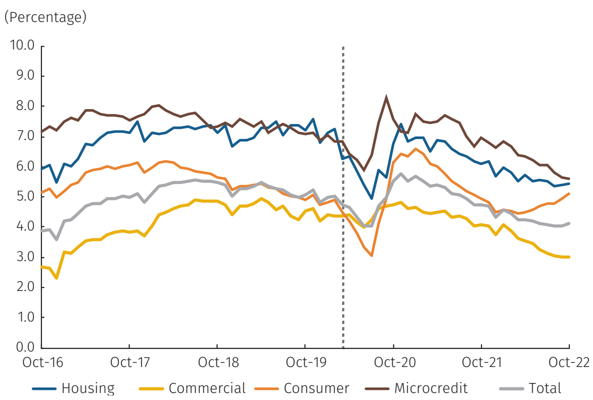
32 In 2022 non-public housing represented 71% of home purchase loans against 79% in 2021.

Graph 3.18
Gross national loan portfolio in COP
(Annual change, average monthly data)




a/ Adjusted housing: banking portfolio plus securitizations
Sources: Office of the Financial Superintendent of Colombia, calculations by *Banco de la República*.

Graph 3.19
NPL Indicator
(Past due portfolio/ Total portfolio)




Sources: Office of the Financial Superintendent of Colombia, calculations by *Banco de la República*.

Other funding sources available to companies, including loans granted by foreign banks and bond issuances, have decreased.[33] Meanwhile, annual microcredit growth stood at close to 14.4%, centered primarily on disbursements agreed for terms longer than one year

**Credit institutions maintain high solvency adequacy ratios, profits have stabilized, delinquency is covered, and they show resilience in adverse scenarios.** As of October 2022, basic solvency and risk-based solvency indicators stood at 14.2% and 17.9%, respectively, representing a wide margin compared to the minimum requirements (4.5% and 9.0%, respectively). The twelve-month profit amount (COP 18.6 billion) exceeded the previous year's figure by 38%, though lower than those calculated for mid-year (COP 20.5 billion). This decrease resulted from the dilution effect of extraordinary income associated with capital investments by the entities. Throughout the year, the delinquency rate for consumer loans increased from 4.5% to 5.1%, but defaults are covered at a rate of 144% (Graph 3.19). For other loan categories, delinquency continued its downward trend. Finally, the most recent results of financial stress exercises,[34] which simulate extreme macroeconomic scenarios, suggest that the institutions' equity would be able to absorb the shocks and meet the capital adequacy ratios required to continue operating.

33 Compared to 2021, the loan portfolio in US dollars for the final quarter of the year recorded a decrease of 7.0%, while bond issuance decreased by 3.0%.

34 See the "Sensitivity Exercises" sections included in the Financial Stability Reports published by *Banco de la República* https://www.banrep.gov.co/en/financial-stability-report

# Box 1
# Electricity Rates: Recent Developments and Indexation

**Édgar Caicedo García**
**Pablo Montealegre Moreno**
**Álex Fernando Pérez Libreros***

According to the World Bank, the increase in energy prices over the past two years has been the steepest since the 1973 oil crisis, and the rise in international food and fertilizer prices has been the sharpest since 2008. This has occurred against a backdrop of a global energy crisis mainly resulting from Russia's invasion of Ukraine to a degree that the widespread rise in energy prices has been even more pronounced than the recent surge in world food prices (Graph R1.1). Global energy prices are estimated to have risen by nearly 50% in 2022, before dropping in 2023 and 2024.[1]

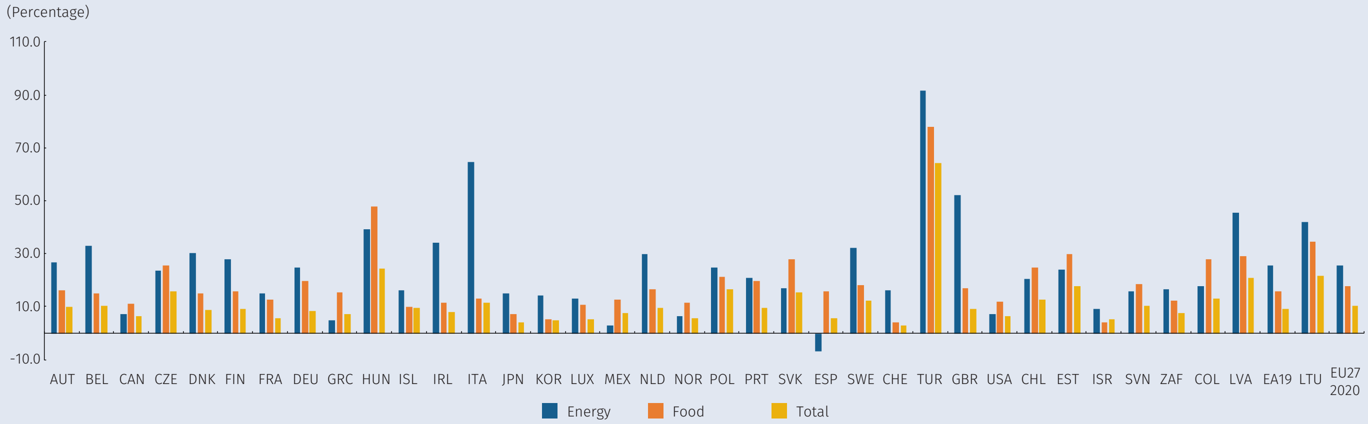
In Colombia, the price of electricity has also increased significantly. In the months before the pandemic and until April 2021, this indicator did not show a defined tendency and kept oscillating at a figure close to the inflation target. However, from May 2021, it began an upward climb as of its annual rate adjustment, reaching its recent peak in October of last year (28.53%), a figure not seen since November 2000 (28.40%). In the last two months of 2022, owing to the adjustment of the regulatory rate structure announced by the Government, the CPI for energy curbed its growth, closing 2022 at 22.4 % (Graph R1.2).

The energy market is highly complex, as is the fixing of rates in each of the stages required to bring the service to the end user. The purpose of this Box is to describe some of these determinants that partly explain the recent price dynamics, to identify the stages where price indexation plays a key role, and to summarize the measures implemented by the sector's authorities at the end of 2022.

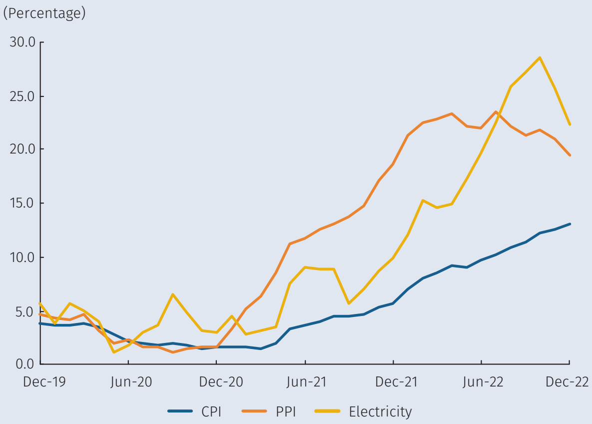
* Messrs Caicedo and Montealegre are analysts at *Banco de la República's* Programming and Inflation Department and Mr. Perez works at in the Bank's Cali branch. The views and opinions expressed herein do not necessarily reflect those of the Bank or its Board of Directors.

1 See: https://www.worldbank.org/en/news/press-release/2022/04/26/food-and-energy-price-shocks-from- ukraine-war

Graph B1.1
Headline inflation, food, and energy as of December 2022
(annual change)



Graph B1.2
Electricity price vs. PPI and CPI
(annual variation)




## 1. General developments in the electricity market and rate regulation

In 1994, the Colombian Congress passed Laws 142 and 143 that defined the regulatory framework for structuring and developing the electric power market among the agents involved in the four primary sector activities: generation, transmission, distribution, and commercialization. Subsequently, through Energy and Gas Regulatory Commission (CREG) Resolution 131 of 1998, electric energy service users were classified as regulated or unregulated. The regulated market, comprising the majority of consumers, consists of industrial, commercial, and residential users whose energy demands total less than 55 MWh/month. In 2007, the CREG approved the general rate formula (Resolution 119), whereby the electricity retailers (includes utilities) determine the costs and prices for the provision of services to regulated users in the National Interconnected System (SIN). The unregulated market is a free market comprised of industry and non-industry users whose energy demand exceeds or equals 55 MWh/month. Unlike the regulated market, in the non-regulated market, the price of energy is freely agreed upon through negotiations between the consumer and the supplier.

Regulated market rates are determined based on the unit cost of service (UC):

$$UC\ (\$/\text{kWh}) = G + T + D + C + L + R$$

Where UC is the unit cost of providing the service ($/kWh); G is the generation cost, namely the cost of producing the energy (contracts indexed to the PPI and CPI, and energy purchases on the exchange); T is the cost of transporting the energy to the power plants (updated with the PPI); D is the cost of distributing it to the end user (updated with the IPP and the ADD);[2] C is the commercialization cost of buying and selling energy (updated monthly with the CPI);[3] L is the energy losses for providing the service;[4] and R is the costs that restrict the energy transmission capacity.[5]

In addition, in the case of households, a specific value is added or subtracted from the unit cost of the service according to the socioeconomic strata of said household. Users in strata 1, 2, and 3 receive a subsidy over their subsistence consumption[6] of 60%, 50%, and 15%, respectively. Strata 4 pays the unit cost of the service, while users in strata 5 and 6, together with commercial and

2 The electricity service distribution areas (ADD for its Spanish acronym) structure unified the fees for the use of the local and regional networks, which led to variability in user rates. For those that paid higher fees than the uniform ADD their fees decreased; while those who had lower fees than those established for the ADD saw rate hikes.

3 Is the sales margin resulting from the cost of buying from the generators and selling the energy, which includes billing, meter readings, and customer service costs, among others.

4 Losses in this context includes both technical and non-technical losses. The former are those generated through the provision of the service due to losses in the transmission of energy to the end user. Non-technical losses are energy losses resulting from illegal connections to the transmission lines, defaults, etc.

5 Restrictions correspond to costs generated by technical conditions of the network (obsolescence), which limit the capacity to transport energy, increasing the unit cost of providing the service.

6 Subsistence consumption was defined by the Mining and Energy Planning Unit's Resolution UPME 0355/2004 as up to 130 kWh/month for users located at an altitude above 1,000 meters above sea level and up to 173 kWh/month for users located below 1,000 meters above sea level.

industrial users, pay a 20 % surcharge on their electricity costs to cover the subsidies granted to users in the lower-income strata.

### 2. Recent developments in electricity service rates

By December 2022, the electricity generated in Colombia was mostly hydroelectric (76.9 %), and to a lesser extent thermal (14.2 %) while other sources represented 8.9 %. In this month, the daily useful volume of water in reservoirs averaged 79.04%.[7] This value tends to fluctuate in periods with less rainfall, for example during the El Niño phenomenon, a meteorological event that reduces the level of reservoirs and hydraulic generation and is offset with greater thermal generation that has higher production cost and thus increases energy rates. The current La Niña event has been favoring hydroelectric power generation and limiting the increase of energy prices, as present-day rates would be higher if we were experiencing a period of low rainfall or an El Niño phenomenon.

Despite the favorable condition of the reservoirs, most contracts for the sale of electricity from generators to retailers are indexed to the PPI of internal supply, which underwent an annual adjustment as of December 2022 of 19.4%. As described above, the generation rate factor is not the only one indexed to the PPI, as transportation and distribution are also updated monthly with this indicator. Consequently, these pricing factors have been contributing significantly to the marked annual change of the CPI for electricity in recent months. Similarly, the commercialization component, which is tied to the CPI, has been reflecting in its behavior the high consumer inflation, which in December stood at 13.1%.

In addition to the indexation of most of the components that determine the unit cost of the electric energy service, in 2020, in response to the economic crisis resulting from the Covid-related pandemic, the sector authorities established a rate option (CREG Resolution 012) that deferred the programmed rate increases until the end of the public health emergency, which officially ended in June 2022. Accordingly, as of the following month, the adjustments that were not applied during the pandemic began to be included in the energy service charges.[8] According to information from the Public Services Superintendence, Bogotá would be caught up regarding this deferment, while Medellín and, in general, the cities of the Atlantic Coast show delays in its implementation.[9]

In addition to the above, international prices of fossil fuels (gas, coal, and oil) began to rise sharply in mid-2020 and, although they curbed their growth in the second half of 2022, currently stand at historically high levels. This drives up the cost of thermal energy generation, which, as previously mentioned, represents more than 10% of total electricity generation in the country. Additionally, investments to expand coverage and improve networks in some cities, as well as to transform the energy matrix to clean energy (wind and solar), are compensated within the unit cost of service and consequently drive up electricity rates.

It should be noted that the cities of the Atlantic Coast have the highest electricity unit cost in the entire country. In general, the annual change at yearend 2022 in electricity services for these cities was double the national average. This growth trend observed for the Caribbean region is related to additional regional factors including the instability of the electricity grid, which increases the unit cost. Also, according to estimates by the Colombian Association of Electric Energy Distributors (Asocodis), technical losses (due to network obsolescence), and non-technical losses (due to illegal connections and payment defaults) are higher than those of the rest of the country.[10] Additionally, the increase in electricity rates has been higher in the north of the country, partly due to the implementation of CREG Resolution 010 of 2020, which established a special transitional rate regime in which the percentage of losses recognized in the rates that

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7 *Monthly Executive Report on the Colombian Electricity Market*, Derivex, December 2022.

8 With information to August, it was estimated that close to COP 3.5 trillion remained outstanding. See CREG Resolution 701-019 of 13 September 2002.

9 See: https://www.superservicios.gov.co/sites/default/files/inline-files/informacion_tarifaria_de_energia_principales_comercializadores_integrados_al_operador_de_red_diciembre_2020__0 %20 %281 %29.xlsx

10 See: https://www.larepublica.co/empresas/air-e-y-afinia-son-las-empresas-con-el-mayor-indice-de-perdida-de-energia-por-hurto-3297960

can be assumed by the users in the Caribbean region is 28.1%,[11] and 12.5% for the rest of the country.[12]

### 3. Recent Adjustments in Rate Regulation and Their Effects During Recent Months

In mid-September 2022, the Ministry of Mines and Energy announced a national agreement to lower electricity prices, called the *Pacto por la Justicia Tarifaria* (Pact for Fair Rates). This strategy includes a series of regulations, among which the following stand out: lower service prices for electricity consumers, the renegotiation of bilateral contracts between retailers and generators at lower prices, the oversight of these agreements, and the continuation of dialogues with all the stakeholders in the chain to protect consumers.

Within the portfolio of regulations that this national agreement contains to decrease electricity prices is CREG Resolution 101-029 of September 16, 2022, which aims to temporarily allow changes (between October and December 2022) to the terms of the contracts entered into by retailers in the energy market, the fees for use of the networks and the payment terms stipulated for these contracts. The purpose of the above was to provide greater financial flexibility to the commercialization companies (retailers) without compromising the provision of services. Previously, the retailers had a maximum payment period of thirty calendar days, while the new payment period for deferred amounts would be eighteen months as of January 2023. The retailers will be able to defer up to 20% of their financial obligations for transactions in the wholesale energy market and fees for the use of the national transmission network.

Furthermore, CREG Resolution 101-028 of September 16, 2022 (which will be effective for five months) seeks to optimize the operations of thermoelectric plants according to their number of units and power. These changes are expected to help reduce costs for the restrictions component of the UC rate formula.

Within the new regulations defined by Resolution 101-027 of September 16, 2022, the CREG established that the monthly variation the retailer may apply on the rate will be capped at the CPI of the prior month and the minimum may be equal to or less than 0%. Before this regulation, this component had a floor of 0.6% of the monthly variation (equal to a 7.2% annual adjustment). This allows for the possibility that rate increases may be smaller and may even result in a decrease in rates. Additionally, this same resolution modified the indexers that updated transmission and distribution charges as of 2021. This change also seeks to reduce the base on which these rate components are calculated, so that they are computed on a lower value. Consequently, as of January 2021, these rate components will no longer be indexed to the PPI and will be recalculated between December 2020 and September 2022 with the lower of the CPI, the PPI, or an index proposed by the sector's agents. Finally, CREG Resolution 101-031 of September 30, 2022, which amended Resolution 101-027, stipulates that as of January 2023, the retailers integrated with the network operators (distributors) that have accepted the agreement may increase their rates between December 2022 and September 2023 up to a +0.3 percentage-point monthly variation of the CPI. Those who did not accept the agreement will be able to increase rates only according to the monthly variation of the CPI.

As a result of the Colombian authorities' decisions to reduce electricity rates, the CPI for this service fell over the last two months of 2022. In November, information collected by the National Administrative Department of Statistics, DANE, shows that electricity rates nationally would have fallen by 1.14%, while in December they would have contracted by an additional 0.85%.

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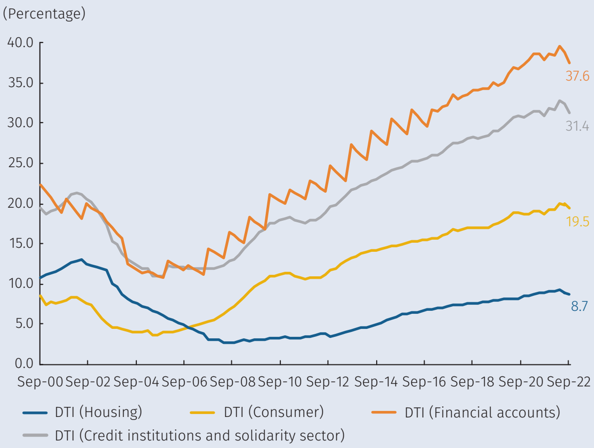
11 Is the average percentage of losses recognized in the rates authorized for the two companies providing service on the Atlantic Coast, Air-e and Afinia (29% and 27.2%, respectively).

12 Amylkar Acosta, September 18, 2022, *"¿Qué hacemos con la hiperinflación de las tarifas de energía?"*, Digital magazine *Razón Pública*. Accessed at: https://razonpublica.com/hacemos-la-hiperinflacion-las-tarifas-energia/

# Box 2
# Indicators of Household Indebtedness

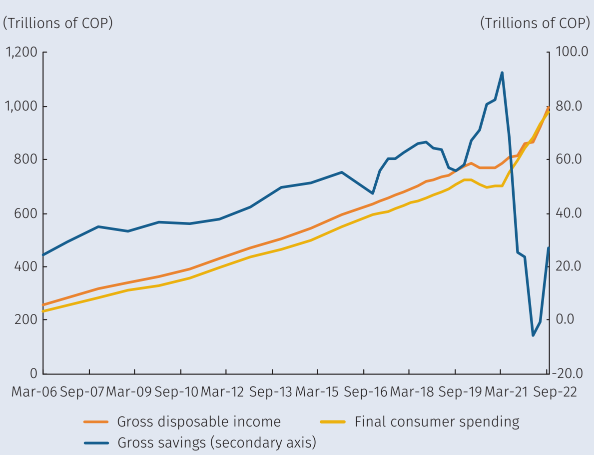
**Camilo Gómez**
**Juan Sebastián Mariño***

Graph B2.1
Debt-to-annualized adjusted net disposable income ratio of households




Note: The graph presents the ratio of debt to gross adjusted household disposable income (DTI: debt-to-income ratio). Income comes from national accounts by institutional sector data published by the DANE. The four measures of indebtedness presented are:
1. Gray line: household debt with credit institutions supervised by the Office of the Financial Superintendent of Colombia, savings and credit cooperatives, employee funds and the Colombian Securitization Office.
2. Orange line: household debt from financial account balances published by Banco de la República. In addition to what is included in the gray line, this line includes microcredits and commercial loans for natural persons, and obligations with other financial institutions. The series presents volatility because it switched in 2015 from an annual frequency before to quarterly.
3. Yellow line: Consumption credit with credit institutions
4. Blue line: housing loans with credit institutions
Sources: Office of the Financial Superintendent of Colombia, Superintendence of Solidarity Economy, calculations by *Banco de la República*.

Graph B2.2
Annualized flow of gross household savings and its components




Sources: DANE

Within a backdrop of a significant rise in household indebtedness, inflation continuing above the target for a prolonged period, a resulting increase in the lending interest rates, and an expected economic slowdown in 2023, it is important to monitor the financial capability of households to face this macroeconomic scenario. This variable has been analyzed in the last three issues of *Banco de la República's Financial Stability Report*,[1] as well as in a complementary special report thereof.[2] The purpose of this Box is to update some of the analyses presented in these documents with more current information, considering indicators of household indebtedness, savings, and financial burden, as well as the most recent delinquency results of household obligations to the financial system.

Graph R2.1 illustrates the debt-to-annualized net disposable income[3] ratio of households. This indicator measures household leverage to the Colombian financial system. As can be seen in this graph, the four indicators have exhibited an upward trend during the last twenty years, reaching historic highs at the beginning of 2022. Although the indicators have fallen slightly since then, household debt as a percentage of income remains at relatively high levels. High indebtedness could imply an increase in the financial burden of households and, therefore, increase their likelihood of default.

Graph R2.2 shows the dynamics of the annualized flow[4] of gross household savings and its causes (gross disposable income and final consumption expenditure). As can be observed, since records have been kept and until 2021, households were net savers for the Colombian economy; namely, the flow of their income exceeded the flow of their expenditures. During the pandemic, partly as a precautionary measure, households increased their savings to historic highs, and then decreased these drastically as the economy reopened, reaching a negative value in early 2022. Although savings turned positive in the most recent measurement, they remain at low levels compared to their historic levels. Lower savings reduce households' capacity to respond to negative shocks to the economy.

In order to evaluate the capability of households to meet their financial obligations, *Banco de la República*, through its *Recent*

* The authors are members of *Banco de la República's* Financial Stability Department.

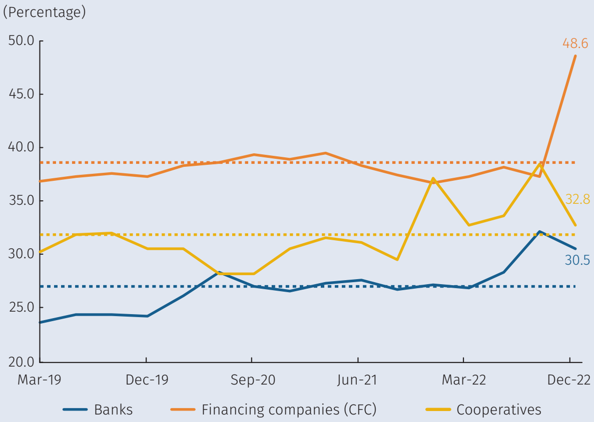
1 For more information, please see Box 2: Recent behavior of household's financial position in the *Financial Stability Report* for the second semester of 2022, available in its Spanish version at: https://repositorio.banrep.gov.co/bitstream/handle/20.500.12134/10568/reporte-estabilidad-financiera-segundo-semestre-2022.pdf

2 For more information, please see the household's financial position information in the *Financial Stability Report* for the second semester of 2022, available in its Spanish version at: https://repositorio.banrep.gov.co/bitstream/handle/20.500.12134/10568/reporte-estabilidad-financiera-segundo-semestre-2022.pdf

3 This income includes social transfers in kind received by households.

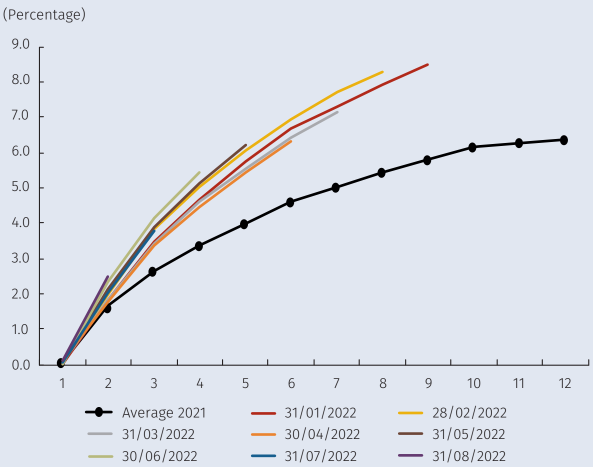
4 Cumulative for the last four quarters.

Graph B2.3
Average financial burden of households accessing new credits




Note: The dotted lines show the historical average of the financial burden reported by each type of credit institution.
Sources: Survey of the Credit Situation in Colombia, December 2022 (available only in Spanish); calculations by *Banco de la República*.

Graph B2.4
NPL of consumption credit vintages




Sources: Office of the Financial Superintendent of Colombia.

*Performance of Credit in Colombia*[5] (available only in Spanish), asks credit institutions information on the average financial burden[6] of debtors that have acquired new loans granted in the most recent quarter. As can be seen in Graph R2.3, the indicator shows relatively high values for the three types of credit institutions versus its historical average. This is consistent with the increase in loan interest rates and the high levels of indebtedness described above.

Finally, to evaluate the materialization of household credit risk in the recent past, Graph R2.4 illustrates the non-performing loans indicator (NPL) of recent consumer credit vintages.[7] Specifically, each line of the graph presents the NPL of loans initiated at a given point in time for a number of months after their origination (horizontal axis). The above allows us to evaluate the progression of delinquency over time for the loans analyzed. As can be observed, those loans granted more recently initiated show an increase in delinquency compared to those granted in the first months of 2022, as well as compared to the average of loans disbursed in 2021, and even compared to those of previous years that presented greater materializations of credit risk. The above behavior has been mainly driven by the unspecified use and credit card segments.

In conclusion, the economic reactivation observed after the pandemic has occurred within a backdrop of accelerated domestic demand, high indicators of household indebtedness, and a decline in household savings. Likewise, higher debt and loan interest rates have resulted in a more excessive financial burden. These dynamics have occurred together with increases in delinquencies of the loans granted throughout 2022. All of the above reduces households' capacity to respond to negative shocks in economic activity. The Office of the Financial Superintendent of Colombia has reacted to the deteriorating consumer loan portfolio by requiring additional provisions[8] from credit institutions for this modality. Likewise, the significant and timely increase in the monetary policy interest rate has transferred into the rates for new loans, which contributes to preventing excessive increases in household leverage within a setting of economic deceleration and a process of disinflation over the next two years.

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5 https://www.banrep.gov.co/en/blog/recent-performance-credit-colombia-only-spanish

6 Financial burden is defined as the percentage of disposable income destined to the payment of installments of loans held by households.

7 The NPL is defined as the percentage of loans that are more than 30 days past due in the total loan portfolio.

8 In response to the recent rapid growth of the consumer loan portfolio, the SFC issued External Circular 026 of 2022, which provides instructions for the creation of risk provisions on the consumer loan portfolio to face the possible materialization of risks. For the above, the term adjustment factor to create individual provisions was modified and the possibility of making additional general provisions was added. For more information, see Chapter 4 of the Financial Stability Report for the second half of 2022, available only in its Spanish version at: https://repositorio.banrep.gov.co/bitstream/handle/20.500.12134/10568/reporte-estabilidad-financiera-segundo-semestre-2022.pdf.

# Annex 1
# Macroeconomic Forecasts by Local and Foreign Analysts a/, b/

| | Units | Jan-23 | Dec-23 | Jan-24 | Dec-24 | Jan-25 |
|---|---|---|---|---|---|---|
| Headline CPI | Monthly variation (average) | 1.61 | n. d. | n. d. | n. d. | n. d. |
| CPI excluding food | Monthly variation (average) | 1.31 | n. d. | n. d. | n. d. | n. d. |
| Headline CPI | Annual variation (average), end of period | 13.06 c/ | 8.63 | 7.86 | 5.05 | 4.59 |
| CPI excluding food | Annual variation (average), end of period | 10.10 c/ | 7.97 | 7.37 | 4.63 | 4.22 |
| Nominal exchange rate | COP per USD, end of period | 4.765 | 4.718 | 4.700 | 4.600 | 4.560 |
| Monetary policy rate | Percentage, end of period | 13.00 | 10.00 | 9.50 | 6.00 | 5.50 |

| | Units | IV-2022 | 2022 | I-2023 | II-2023 | III-2023 | IV-2023 | 2023 | I-2024 | II-2024 | III-2024 | IV-2024 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GDP | Annual change, original series | 4.2 | 8.0 | 2.3 | 1.1 | 0.6 | 0.9 | 1.4 | 2.0 | 2.5 | 2.7 | n. d. |
| Unemployment | Thirteen cities, quarterly average | 9.8 | n. d. | 11.4 | 11.2 | 11.0 | 10.8 | n. d. | 11.7 | 11.2 | 11.0 | n. d. |
| IBR (90 days) | Effective annual rate, end of period | n. a. | n. d. | 13.0 | 12.4 | 11.0 | 10.0 | n. d. | 8.3 | 7.4 | 6.7 | 6.0 |
| DTF | Effective annual rate, end of period | n. a. | n. d. | 13.4 | 13.4 | 12.3 | 10.7 | n. d. | 9.2 | 8.1 | 7.2 | 6.3 |
| Fiscal Deficit (GNC) d/ | Share of GDP | n. d. | n. d. | n. d. | n. d. | n. d. | n. d. | 4.3 | n. d. | n. d. | n. d. | n. d. |
| Direct Account Deficit d/ | Share of GDP | n. d. | n. d. | n. d. | n. d. | n. d. | n. d. | 5.0 | n. d. | n. d. | n. d. | n. d. |

n/a: not available or relevant
a/ As of *the July 2020 Monetary Policy Report*, the survey of local and foreign macroeconomic analysts was suspended, and the data provided here are the results of the Monthly Survey of Economic Analyst
Expectations (EME for its Spanish acronym) conducted by *Banco de la República.*
b/ Is the response median to *Banco de la República's Monthly Survey of Economic Analyst Expectations*, except for the CPI and CPI excluding food, which are the response average.
c/ Data calculated based on the results of *Banco de la República's* Monthly Survey of Economic Analyst Expectations (EME).
d/ Positive values represent deficit and negative values represent surplus.
Sources: *Banco de la República Monthly Survey of Economic Analyst Expectations*, conducted in January 20.

# Annex 2
# Main macroeconomic forecasting variables

| | | Years | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
| Exogenous variables | | | | | | | | | | | | |
| External [a/] | | | | | | | | | | | | |
| GDP of trading partners [b/] | Percentage, annual var., seasonally adjusted | 2.7 | 2.1 | 1.6 | 2.6 | 2.6 | 1.4 | -6.5 | 7.1 | **3.0** | **1.2** | **2.0** |
| Oil price (Brent benchmark) | Dollars per barrel, average of the period | 99 | 54 | 45 | 55 | 72 | 64 | 43 | 71 | 99 | **87** | **84** |
| Federal funds effective rate (Fed) | Percentage, average for the period | 0.09 | 0.13 | 0.39 | 1.00 | 1.83 | 2.16 | 0.36 | 0.08 | 1.68 | **4.96** | **4.33** |
| 5-year Credit Default Swap for Colombia | Basis points, average for the period | 101 | 184 | 212 | 129 | 114 | 99 | 142 | 142 | 259 | **289** | **272** |
| Internal | | | | | | | | | | | | |
| Neutral real interest rate for Colombia | Percentage, average for the period | 1.4 | 1.5 | 1.6 | 1.3 | 1.3 | 1.2 | 1.3 | 1.5 | **2.0** | **2.2** | **2.3** |
| Potential GDP for Colombia (trend) | Percentage, annual change | 3.9 | 3.3 | 2.7 | 2.4 | 2.3 | 2.5 | 0.1 | 4.2 | **4.3** | **2.8** | **2.4** |
| Endogenous variables | | | | | | | | | | | | |
| Prices | | | | | | | | | | | | |
| Total CPI | Percentage, annual change, end of period | 3.66 | 6.77 | 5.75 | 4.09 | 3.18 | 3.80 | 1.61 | 5.62 | 13.12 | **8.71** | **3.50** |
| CPI excluding food [c/] | Percentage, annual change, end of period | 3.28 | 5.25 | 5.51 | 5.03 | 3.51 | 3.45 | 1.03 | 3.44 | 9.99 | . | . |
| CPI for goods (excluding food and regulated items) | Percentage, annual change, end of period | 1.75 | 7.27 | 5.91 | 3.24 | 1.40 | 2.18 | 0.63 | 3.31 | 15.04 | . | . |
| CPI for services (excluding food and regulated items) | Percentage, annual change, end of period | 3.34 | 4.64 | 5.26 | 5.38 | 3.13 | 3.45 | 1.29 | 2.18 | 7.41 | . | . |
| CPI for regulated items | Percentage, annual change, end of period | 4.89 | 4.43 | 5.63 | 6.26 | 6.65 | 4.81 | 0.73 | 7.10 | 11.77 | **11.51** | **5.30** |
| CPI for food [d/] | Percentage, annual change, end of period | 5.24 | 13.08 | 6.65 | 0.48 | 1.87 | 5.80 | 4.80 | 17.23 | 27.81 | **5.74** | **0.29** |
| CPI for perishable food | Percentage, annual change, end of period | 16.74 | 26.03 | -6.63 | 5.84 | 8.88 | 8.66 | 2.49 | 24.42 | 36.44 | . | . |
| CPI for processed food | Percentage, annual change, end of period | 2.54 | 9.62 | 10.74 | -0.91 | -0.08 | 5.04 | 5.43 | 15.32 | 25.33 | . | . |
| Core inflation indicators [e/] | | | | | | | | | | | | |
| CPI excluding food | Percentage, annual change, end of period | 3.28 | 5.25 | 5.51 | 5.03 | 3.51 | 3.45 | 1.03 | 3.44 | 9.99 | . | . |
| Core CPI 15 | Percentage, annual change, end of period | 3.19 | 5.59 | 5.98 | 4.21 | 3.22 | 3.78 | 1.88 | 4.42 | 11.55 | . | . |
| CPI excluding food and regulated items | Percentage, annual change, end of period | 2.82 | 5.50 | 5.48 | 4.67 | 2.57 | 3.10 | 1.11 | 2.49 | 9.51 | **8.69** | **3.77** |
| Average of all core inflation indicators | Percentage, annual change, end of period | 3.10 | 5.44 | 5.66 | 4.64 | 3.10 | 3.44 | 1.34 | 3.45 | 10.35 | . | . |
| Representative market exchange rate (TMR) | Pesos per dollar, average for the period | 2,001 | 2,746 | 3,053 | 2,951 | 2,957 | 3,282 | 3,691 | 3,747 | 4,257 | . | . |
| Real exchange rate Inflationary gap of the | Percentage, average for the period | -0.3 | 9.5 | 2.5 | -1.8 | -0.8 | 3.6 | 6.1 | 2.6 | 6.6 | **5.5** | **-0.2** |
| Economic activity | | | | | | | | | | | | |
| Gross domestic product (sats)* | Percentage, annual change, sats | 4.5 | 3.0 | 2.1 | 1.4 | 2.6 | 3.2 | -7.0 | 10.7 | **8.0** | **0.2** | **1.0** |
| Final consumption expense | Percentage, annual change, sats | 4.3 | 3.4 | 1.6 | 2.3 | 4.0 | 4.3 | -4.2 | 13.9 | **8.9** | . | . |
| Household final consumption expenditure | Percentage, annual change, sats | 4.2 | 3.1 | 1.6 | 2.1 | 3.2 | 4.1 | -5.0 | 14.8 | **9.6** | . | . |
| General government final consumption expenditure | Percentage, annual change, sats | 4.7 | 4.9 | 1.8 | 3.6 | 7.4 | 5.3 | -0.6 | 10.3 | **4.6** | . | . |
| Gross capital formation | Percentage, annual change, sats | 12.0 | -1.2 | -0.2 | -3.2 | 1.5 | 3.0 | -20.5 | 12.2 | **17.2** | . | . |
| Gross fixed capital formation | Percentage, annual change, sats | 9.2 | 2.8 | -2.9 | 1.9 | 1.0 | 2.2 | -23.3 | 11.2 | **11.7** | . | . |
| Housing | Percentage, annual change, sats | 10.4 | 9.5 | -0.2 | -1.9 | -0.4 | -8.9 | -30.3 | 22.6 | **5.9** | . | . |
| Other buildings and structures | Percentage, annual change, sats | 9.6 | 10.2 | 0.0 | 4.6 | -3.5 | 1.1 | -30.9 | -3.0 | **4.3** | . | . |
| Machinery and equipment | Percentage, annual change, sats | 9.2 | -9.3 | -7.9 | 1.4 | 8.6 | 12.3 | -13.4 | 19.1 | **23.0** | . | . |
| Cultivated biological resources | Percentage, annual change, sats | -1.3 | 2.3 | 13.1 | 0.3 | -3.1 | 7.9 | -1.8 | 3.7 | **-7.5** | . | . |
| Intellectual property products | Percentage, annual change, sats | 5.1 | 1.3 | -12.0 | 1.2 | 1.5 | -0.7 | -10.8 | 10.3 | **15.7** | . | . |
| Domestic demand | Percentage, annual change, sats | 6.0 | 2.4 | 1.2 | 1.1 | 3.5 | 4.0 | -7.5 | 13.6 | **10.9** | . | . |
| Exports | Percentage, annual change, sats | -0.3 | 1.7 | -0.2 | 2.6 | 0.6 | 3.1 | -22.7 | 14.8 | **15.7** | . | . |
| Imports | Percentage, annual change, sats | 7.8 | -1.1 | -3.5 | 1.0 | 5.8 | 7.3 | -20.5 | 28.7 | **24.2** | . | . |
| Product gap [f/] | Porcentaje | 1.3 | 1.0 | 0.4 | -0.6 | -0.4 | 0.3 | -7.1 | -1.1 | **2.5** | **-0.1** | **-1.4** |
| Short-term indicators | | | | | | | | | | | | |
| Real production of manufacturing industry | Percentage, var. annual, seasonally adjusted | 1.7 | 2.1 | 3.7 | -0.1 | 2.9 | 1.3 | -8.0 | 15.8 | . | . | . |
| Retail trade sales, excluding fuels or vehicles | Percentage, var. annual, seasonally adjusted | 8.4 | 6.4 | 2.0 | -0.1 | 5.4 | 8.1 | -1.7 | 11.9 | . | . | . |
| Coffee production | Percentage, var. annual, cum. for period | 11.5 | 16.8 | 0.4 | -0.3 | -4.5 | 8.8 | -5.8 | -9.5 | -11.9 | . | . |
| Oil production | Percentage, annual var., period average | -1.9 | 1.6 | -11.7 | -3.7 | 1.4 | 2.4 | -11.8 | -5.8 | . | . | . |
| Labor market [g/] | | | | | | | | | | | | |
| Total national | | | | | | | | | | | | |
| Unemployment rate | Percentage, annual var., period average | 9.4 | 9.2 | 9.5 | 9.7 | 10.0 | 10.9 | 16.5 | 13.8 | **11.2** | **11.3** | . |
| Occupancy Rate | Percentage, annual var., period average | 61.1 | 61.3 | 60.5 | 60.0 | 59.1 | 57.7 | 50.4 | 53.1 | . | . | . |
| Overall participation rate | Percentage, annual var., period average | 67.4 | 67.5 | 66.9 | 66.4 | 65.7 | 64.8 | 60.4 | 61.5 | . | . | . |
| Thirteen cities and metropolitan areas | | | | | | | | | | | | |
| Unemployment rate | Percentage, annual var., period average | 10.2 | 10.1 | 10.3 | 11.0 | 11.1 | 11.5 | 18.9 | 15.2 | **11.2** | **11.0** | . |
| Occupancy Rate | Percentage, annual var., period average | 62.8 | 62.6 | 61.7 | 60.5 | 59.6 | 58.8 | 50.8 | 53.8 | . | . | . |
| Overall participation rate | Percentage, annual var., period average | 69.9 | 69.6 | 68.8 | 67.9 | 67.1 | 66.4 | 62.7 | 63.5 | . | . | . |
| Balance of payments [h/i/] | | | | | | | | | | | | |
| Current account (A + B + C) | Millions of dollars | -19,819 | -18,702 | -12,587 | -9,924 | -14,041 | -14,808 | -9,347 | -17,997 | **-21,366** | **-13,595** | . |
| Percentage of GDP | Percentage, nominal terms | -5.2 | -6.3 | -4.4 | -3.2 | -4.2 | -4.6 | -3.4 | -5.7 | **-6.3** | **-3.9** | . |
| A. Goods and services | Millions of dollars | -12,332 | -19,004 | -13,451 | -8,762 | -10,556 | -14,146 | -13,090 | -20,048 | **-16,919** | **-10,149** | . |
| B. Primary income (factor income) | Millions of dollars | -12,108 | -5,450 | -5,312 | -8,046 | -11,442 | -9,717 | -5,044 | -8,723 | **-16,845** | **-14,724** | . |
| C. Secondary income (current transfers) | Millions of dollars | 4,622 | 5,752 | 6,177 | 6,883 | 7,957 | 9,055 | 8,788 | 10,775 | **12,398** | **11,278** | . |
| Financial account (A + B + C + D) | Millions of dollars | -19,292 | -18,060 | -12,339 | -9,625 | -12,954 | -13,298 | -8,161 | -16,513 | , | , | . |
| Percentage of GDP | Percentage, nominal terms | -5.1 | -6.1 | -4.4 | -3.1 | -3.9 | -4.1 | -3.0 | -5.3 | . | . | . |
| A. Foreign investment (ii - i) | Millions of dollars | -12,270 | -7,403 | -9,341 | -10,011 | -6,172 | -10,836 | -5,772 | -6,201 | . | . | . |
| i. Foreign Investment in Colombia (FDI) | Millions of dollars | 16,169 | 11,621 | 13,858 | 13,701 | 11,299 | 13,989 | 7,459 | 9,381 | . | . | . |
| ii. Colombian abroad | Millions of dollars | 3,899 | 4,218 | 4,517 | 3,690 | 5,126 | 3,153 | 1,686 | 3,181 | . | . | . |
| B. Portfolio investment | Millions of dollars | -11,565 | -9,091 | -4,945 | -1,800 | 862 | 24 | -1,768 | -4,595 | . | . | . |
| C. Other investment (loans, other credits, and derivatives) | Millions of dollars | 106 | -1,981 | 1,781 | 1,641 | -8,831 | -5,820 | -4,949 | -6,371 | . | . | . |
| D. Reserve assets | Millions of dollars | 4,437 | 415 | 165 | 545 | 1,187 | 3,333 | 4,328 | 654 | . | . | . |
| Errors and omissions (E&O) | Millions of dollars | 526 | 642 | 247 | 299 | 1,087 | 1,509 | 1,186 | 1,483 | . | . | . |
| Interest rates | | | | | | | | | | | | |
| Policy interest rate [j/] | Percentage, period average | 3.88 | 4.67 | 7.10 | 6.10 | 4.35 | 4.25 | 2.87 | 1.91 | 7.20 | . | . |
| Policy rate expected by analysts [k/] | Percentage, period average | | | | | | | | | | **12.38** | **8.17** |
| IBR* overnight | Percentage, period average | 3.8 | 4.7 | 7.1 | 6.1 | 4.3 | 4.3 | 2.9 | 1.9 | 7.2 | . | . |
| Commercial interest rate [l/] | Percentage, period average | 8.7 | 9.4 | 12.8 | 11.1 | 9.3 | 8.8 | 7.4 | 6.2 | 13.3 | . | . |
| Consumer interest rate [m/] | Percentage, period average | 17.3 | 17.2 | 19.2 | 19.4 | 17.9 | 16.5 | 15.0 | 14.3 | 21.1 | . | . |
| Mortgage interest rate [n/] | Percentage, period average | 11.1 | 11.0 | 12.4 | 11.6 | 10.6 | 10.4 | 10.1 | 9.1 | 12.9 | . | . |

Note: values in bold are forecasts or assumptions.
sats: seasonally adjusted time series, modified to eliminate the effect of seasonal and calendar influences.
a/ Quarterly data in bold are assumptions based on the annual forecast of each variable.
b/ Calculated with the main trading partners (excluding Venezuela) weighted by their share of trade.
c/ Calculations by *Banco de la República*; excluding the CPI item weight for food and non-alcoholic beverages. Consult González, E.; Hernández, R.; Caicedo, E.; Martínez-Cortés, N.; Grajales, A.; Romero, J. (2020). "Nueva clasificación del Banrep de la canasta del IPC y revisión de las medidas de inflación básica en Colombia", *Borradores de Economía*, No. 122, *Banco de la República*, available at: https://investiga.banrep.gov.co/es/be-1122.
d/ Calculations by *Banco de la República*; equal to the CPI item weight of Food and non-alcoholic beverages produced by DANE (does not include the subclasses corresponding to meals outside the home). See González, E.; Hernández, R. et al, Ibid.
e/ Calculations by *Banco de la República*. See González, E.; Hernández, R. et al, Ibid.
f/ The historical gap estimate is calculated based on the difference between observed GDP (cumulative 4 quarters) and potential GDP (trend; cumulative 4 quarters) resulting from the 4GM model; in the forecast it is calculated from the difference between the technical staff's estimate of GDP (cumulative 4 quarters) and potential GDP (trend; cumulative 4 quarters) resulting from the 4GM model.
g/ Rates are calculated based on seasonally adjusted annual populations.
h/ The results presented follow the recommendations of the sixth edition of the Balance of Payments and International Investment Position Manual (BPM6). See additional information and method changes at http://www.banrep.gov.co/ balance-payments.
i/ Results for 2020 and 2021 are preliminary.
j/ Corresponds to the average annual monetary policy interest rate calculated with the working days of the series.
k/ These projections are calculated as the average of the interest rate that would be in effect in each year according to the median of the monthly responses to the Monthly Survey of Economic Analyst Expectations (EME) conducted by *Banco de la República* in January 2023.
l/ Weighted average of interest rates on ordinary, treasury and preferential loans.
m/ Does not include loans granted through credit cards.
n/ Corresponds to the weighted average of interest rate of the disbursements in COP and UVR (real value unit for its Spanish acronym) for the acquisition of NON-VIS housing (housing that is not social interest housing).

# Annex 2 (continuation)
## Main macroeconomic forecasting variables

| | | 2017 | | | | 2018 | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| Exogenous variables | | | | | | | | | |
| External [a] | | | | | | | | | |
| GDP of trading partners [b] | Percentage, annual var., seasonally adjusted | 2.3 | 3.3 | 3.2 | 3.0 | 2.3 | 3.3 | 1.1 | 1.0 |
| Oil price (Brent benchmark) | Dollars per barrel, average of the period | 55 | 51 | 52 | 61 | 67 | 75 | 76 | 69 |
| Federal funds effective rate (Fed) | Percentage, average for the period | 0.70 | 0.95 | 1.16 | 1.20 | 1.45 | 1.74 | 1.92 | 2.22 |
| 5-year Credit Default Swap for Colombia | Basis points, average for the period | 144 | 130 | 127 | 113 | 99 | 113 | 110 | 132 |
| Internal | | | | | | | | | |
| Neutral real interest rate for Colombia | Percentage, average for the period | | | | | | | | |
| Potential GDP for Colombia (trend) | Percentage, annual change | | | | | | | | |
| Endogenous variables | | | | | | | | | |
| Prices | | | | | | | | | |
| Total CPI | Percentage, annual change, end of period | 4.69 | 3.99 | 3.97 | 4.09 | 3.14 | 3.20 | 3.23 | 3.18 |
| CPI excluding food [c] | Percentage, annual change, end of period | 5.55 | 5.40 | 4.86 | 5.03 | 3.97 | 3.73 | 3.67 | 3.51 |
| CPI for goods (excluding food and regulated items) | Percentage, annual change, end of period | 5.69 | 4.28 | 3.46 | 3.24 | 1.67 | 1.39 | 1.39 | 1.40 |
| CPI for services (excluding food and regulated items) | Percentage, annual change, end of period | 5.87 | 5.55 | 5.02 | 5.38 | 4.09 | 3.79 | 3.60 | 3.13 |
| CPI excluding food | Percentage, annual change, end of period | 4.71 | 6.33 | 6.10 | 6.26 | 6.28 | 6.21 | 6.35 | 6.65 |
| CPI for food [d] | Percentage, annual change, end of period | 1.46 | -1.21 | 0.59 | 0.48 | -0.06 | 1.11 | 1.47 | 1.87 |
| CPI for perishable food | Percentage, annual change, end of period | -13.09 | -14.72 | -0.32 | 5.84 | 7.13 | 8.47 | 9.51 | 8.88 |
| CPI for processed food | Percentage, annual change, end of period | 6.28 | 3.29 | 0.84 | -0.91 | -2.01 | -0.91 | -0.72 | -0.08 |
| Core inflation indicators [e] | | | | | | | | | |
| CPI excluding food | Percentage, annual change, end of period | 5.55 | 5.40 | 4.86 | 5.03 | 3.97 | 3.73 | 3.67 | 3.51 |
| Core CPI 15 | Percentage, annual change, end of period | 5.63 | 5.16 | 4.49 | 4.21 | 3.45 | 3.24 | 3.19 | 3.22 |
| CPI excluding food and regulated items | Percentage, annual change, end of period | 5.81 | 5.13 | 4.50 | 4.67 | 3.28 | 2.99 | 2.87 | 2.57 |
| Average of all core inflation indicators | Percentage, annual change, end of period | 5.66 | 5.23 | 4.62 | 4.64 | 3.57 | 3.32 | 3.24 | 3.10 |
| Representative market exchange rate (TMR) | Pesos per dollar, average for the period | 2,924 | 2,920 | 2,975 | 2,986 | 2,860 | 2,839 | 2,961 | 3,160 |
| Real exchange rate Inflationary gap of the | Percentage, average for the period | -2.9 | -3.2 | -0.7 | -0.2 | -3.3 | -3.8 | -0.4 | 4.5 |
| Economic activity | | | | | | | | | |
| Gross domestic product (sats)* | Percentage, annual change, sats | 1.5 | 1.3 | 1.4 | 1.2 | 2.0 | 2.3 | 3.0 | 2.9 |
| Final consumption expense | Percentage, annual change, sats | 2.2 | 2.3 | 2.6 | 2.3 | 3.8 | 4.1 | 3.9 | 4.0 |
| Household final consumption expenditure | Percentage, annual change, sats | 1.8 | 2.3 | 2.4 | 1.7 | 3.3 | 3.5 | 3.3 | 2.9 |
| General government final consumption expenditure | Percentage, annual change, sats | 4.0 | 2.2 | 3.6 | 4.8 | 6.6 | 7.0 | 7.9 | 7.9 |
| Formación bruta de capital | Percentage, annual change, sats | -0.3 | -1.9 | -4.4 | -6.3 | -6.0 | 1.3 | 0.2 | 11.1 |
| Gross capital formation | Percentage, annual change, sats | -0.8 | 1.4 | 5.9 | 1.0 | -1.8 | 2.5 | 1.5 | 1.9 |
| Housing | Percentage, annual change, sats | 12.7 | -0.6 | -4.4 | -13.2 | -8.8 | -1.6 | 6.2 | 3.6 |
| Other buildings and structures | Percentage, annual change, sats | -4.4 | 6.1 | 11.5 | 5.7 | -6.1 | -0.9 | -6.0 | -1.1 |
| Machinery and equipment | Percentage, annual change, sats | -5.8 | -2.2 | 7.5 | 6.2 | 11.6 | 13.5 | 6.8 | 3.5 |
| Cultivated biological resources | Percentage, annual change, sats | 21.7 | -2.1 | -10.6 | -4.4 | -10.9 | -6.7 | 3.7 | 2.3 |
| Intellectual property products | Percentage, annual change, sats | -5.5 | 2.8 | 4.6 | 3.4 | 2.5 | 3.0 | 0.6 | 0.0 |
| Domestic demand | Percentage, annual change, sats | 1.0 | 1.4 | 1.3 | 0.7 | 1.6 | 3.6 | 3.5 | 5.1 |
| Exports | Percentage, annual change, sats | 1.5 | 5.3 | 3.4 | 0.2 | 0.0 | -2.0 | 1.6 | 2.9 |
| Imports | Percentage, annual change, sats | 3.6 | 1.9 | 1.1 | -2.4 | -1.7 | 4.6 | 5.3 | 15.3 |
| Product gap [f] | Percentage | 0.2 | -0.1 | -0.3 | -0.6 | -0.7 | -0.7 | -0.5 | -0.4 |
| Short-term indicators | | | | | | | | | |
| Real production of manufacturing industry | Percentage, var. annual, seasonally adjusted | -1.9 | -0.3 | 1.2 | 0.5 | 2.9 | 2.4 | 3.6 | 2.6 |
| Retail trade sales, excluding fuels or vehicles | Percentage, var. annual, seasonally adjusted | 0.0 | -0.2 | 0.0 | -0.3 | 4.6 | 5.8 | 5.2 | 6.1 |
| Coffee production | Percentage, var. annual, cum. for period | 13.0 | -17.2 | 17.1 | -10.1 | -5.8 | 13.1 | -13.8 | -6.6 |
| Oil production | Percentage, annual var., period average | -11.6 | -5.2 | 1.5 | 1.9 | 0.7 | 1.2 | 1.1 | 2.6 |
| Labor market [g] | | | | | | | | | |
| Total national | | | | | | | | | |
| Unemployment rate | Percentage, annual var., period average | 9.6 | 9.5 | 9.7 | 9.8 | 9.7 | 9.9 | 9.7 | 10.5 |
| Occupancy Rate | Percentage, annual var., period average | 60.2 | 60.4 | 59.9 | 59.5 | 59.2 | 59.5 | 59.5 | 58.4 |
| Overall participation rate | Percentage, annual var., period average | 66.6 | 66.8 | 66.4 | 66.0 | 65.6 | 66.0 | 65.9 | 65.2 |
| Thirteen cities and metropolitan areas | | | | | | | | | |
| Unemployment rate | Percentage, annual var., period average | 10.8 | 11.0 | 11.3 | 10.9 | 11.1 | 11.0 | 10.8 | 11.5 |
| Occupancy Rate | Percentage, annual var., period average | 61.0 | 60.7 | 60.3 | 59.9 | 59.6 | 59.9 | 60.0 | 58.9 |
| Overall participation rate | Percentage, annual var., period average | 68.3 | 68.3 | 68.0 | 67.2 | 67.1 | 67.3 | 67.3 | 66.6 |
| Balance of payments [h/i] | | | | | | | | | |
| Current account (A + B + C) | Millions of dollars | -3,490 | -2,426 | -2,561 | -1,449 | -3,023 | -3,471 | -3,406 | -4,141 |
| Percentage of GDP | Percentage, nominal terms | -4.7 | -3.2 | -3.2 | -1.7 | -3.7 | -4.2 | -4.0 | -4.9 |
| A. Goods and services | Millions of dollars | -2,730 | -2,551 | -2,326 | -1,154 | -1,840 | -2,557 | -2,672 | -3,487 |
| B. Primary income (factor income) | Millions of dollars | -2,286 | -1,558 | -1,993 | -2,208 | -2,922 | -2,784 | -2,769 | -2,967 |
| C. Secondary income (current transfers) | Millions of dollars | 1,527 | 1,684 | 1,759 | 1,914 | 1,739 | 1,870 | 2,035 | 2,313 |
| Financial account (A + B + C + D) | Millions of dollars | -2,986 | -2,625 | -2,379 | -1,635 | -2,876 | -2,719 | -3,487 | -3,872 |
| Percentage of GDP | Percentage, nominal terms | -4.0 | -3.5 | -3.0 | -2.0 | -3.5 | -3.3 | -4.1 | -4.6 |
| A. Foreign investment (ii - i) | Millions of dollars | -1,743 | -1,217 | -4,112 | -2,939 | -910 | -2,273 | -2,375 | -615 |
| i. Foreign Investment in Colombia (FDI) | Millions of dollars | 2,459 | 2,492 | 4,957 | 3,793 | 1,982 | 3,773 | 2,704 | 2,839 |
| ii. Colombian abroad | Millions of dollars | 716 | 1,275 | 845 | 854 | 1,072 | 1,500 | 330 | 2,224 |
| B. Portfolio investment | Millions of dollars | 182 | -2,178 | -424 | 620 | 1,715 | 350 | 482 | -1,684 |
| C. Other investment (loans, other credits and derivatives) | Millions of dollars | -1,518 | 617 | 2,031 | 512 | -3,817 | -945 | -1,763 | -2,305 |
| D. Reserve assets | Millions of dollars | 93 | 154 | 126 | 173 | 137 | 150 | 169 | 732 |
| Errors and omissions (E&O) | Millions of dollars | 503 | -199 | 181 | -186 | 146 | 752 | -81 | 270 |
| Interest rates | | | | | | | | | |
| Policy interest rate [j] | Percentage, period average | 7.38 | 6.56 | 5.48 | 4.99 | 4.58 | 4.33 | 4.25 | 4.25 |
| Policy rate expected by analysts [k] | Percentage, period average | | | | | | | | |
| IBR* overnight | Percentage, period average | 7.4 | 6.6 | 5.5 | 5.0 | 4.6 | 4.3 | 4.3 | 4.3 |
| Commercial interest rate [l] | Percentage, period average | 12.8 | 11.6 | 10.6 | 10.0 | 9.4 | 9.4 | 9.3 | 9.0 |
| Consumer interest rate [m] | Percentage, period average | 20.1 | 19.7 | 19.0 | 18.7 | 18.7 | 17.9 | 18.0 | 17.3 |
| Mortgage interest rate [n] | Percentage, period average | 12.5 | 12.3 | 11.3 | 10.9 | 10.8 | 10.6 | 10.5 | 10.4 |

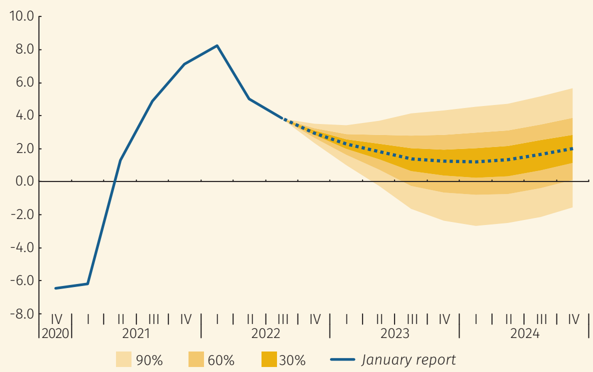
Note: values in bold are forecasts or assumptions.
sats: seasonally adjusted time series, modified to eliminate the effect of seasonal and calendar influences.
a/ Quarterly data in bold are assumptions based on the annual forecast of each variable.
b/ Calculated with the main trading partners (excluding Venezuela) weighted by their share of trade.
c/ Calculations by *Banco de la República*; excluding the CPI item weight for food and non-alcoholic beverages. Consult González, E.; Hernández, R.; Caicedo, E.; Martínez-Cortés, N.; Grajales, A.; Romero, J. (2020). "Nueva clasificación del Banrep de la canasta del IPC y revisión de las medidas de inflación básica en Colombia", *Borradores de Economía*, No. 122, Banco de la República, available at: https://investiga.banrep.gov.co/es/be-1122.
d/ Calculations by *Banco de la República*; equal to the CPI item weight of Food and non-alcoholic beverages produced by DANE (does not include the subclasses corresponding to meals outside the home). See González, E.; Hernández, R. et al, Ibid.
e/ Calculations by *Banco de la República*. See González, E.; Hernández, R. et al, Ibid.
f/ The historical gap estimate is calculated based on the difference between observed GDP (cumulative 4 quarters) and potential GDP (trend; cumulative 4 quarters) resulting from the 4GM model; in the forecast it is calculated from the difference between the technical staff's estimate of GDP (cumulative 4 quarters) and potential GDP (trend; cumulative 4 quarters) resulting from the 4GM model.
g/ Rates are calculated based on seasonally adjusted annual populations.
h/ The results presented follow the recommendations of the sixth edition of the Balance of Payments and International Investment Position Manual (BPM6). See additional information and method changes at http://www.banrep.gov.co/ balance-payments.
i/ Results for 2020 and 2021 are preliminary.
j/ Corresponds to the quarterly average monetary policy interest rate calculated with the working days of the series.
k/ These projections are calculated as the average of the interest rate that would be in effect in each quarter according to the median of the monthly responses to the Monthly Survey of Economic Analyst Expectations (EME) conducted by *Banco de la República* in January 2023.
l/ Weighted average of interest rates on ordinary, treasury and preferential loans.
m/ Does not include loans granted through credit cards.
n/ Corresponds to the weighted average of interest rate of the disbursements in COP and UVR (real value unit for its Spanish acronym) for the acquisition of NON-VIS housing (housing that is not social interest housing).

| 2019 | | | | 2020 | | | | 2021 | | | | 2022 | | | | 2023 | | | | 2024 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| 0.8 | 3.2 | 1.6 | -1.8 | -7.4 | -43.7 | 49.8 | 12.7 | 5.4 | 5.7 | 5.9 | 4.0 | 1.5 | 1.5 | 3.4 | **0.5** | **0.9** | **0.9** | **1.0** | **1.5** | **2.5** | **2.5** | **2.5** | **2.5** |
| 64 | 68 | 62 | 62 | 51 | 33 | 43 | 45 | 61 | 69 | 73 | 80 | 98 | 112 | 98 | 89 | **85** | **88** | **87** | **86** | **84** | **84** | **84** | **84** |
| 2.40 | 2.40 | 2.20 | 1.65 | 1.23 | 0.06 | 0.09 | 0.09 | 0.08 | 0.07 | 0.09 | 0.08 | 0.12 | 0.76 | 2.20 | 3.65 | **4.56** | **5.04** | **5.13** | **5.13** | **4.94** | **4.43** | **4.10** | **3.83** |
| 121 | 104 | 90 | 83 | 125 | 206 | 132 | 104 | 110 | 131 | 143 | 185 | 209 | 238 | 275 | 314 | **291** | **291** | **289** | **285** | **281** | **275** | **270** | **264** |
| 3.21 | 3.43 | 3.82 | 3.80 | 3.86 | 2.19 | 1.97 | 1.61 | 1.51 | 3.63 | 4.51 | 5.62 | 8.53 | 9.67 | 11.44 | 13.12 | **12.92** | **12.32** | **10.79** | **8.71** | **6.86** | **5.32** | **4.18** | **3.50** |
| 3.27 | 3.22 | 3.37 | 3.45 | 3.26 | 1.40 | 1.57 | 1.03 | 1.06 | 2.70 | 3.03 | 3.44 | 5.31 | 6.84 | 8.33 | 9.99 | . | . | . | . | . | . | . | . |
| 1.09 | 1.60 | 1.83 | 2.18 | 2.41 | 0.73 | 1.15 | 0.63 | 1.05 | 2.57 | 2.97 | 3.31 | 6.41 | 8.30 | 11.57 | 15.04 | . | . | . | . | . | . | . | . |
| 3.01 | 3.10 | 3.37 | 3.45 | 3.22 | 2.00 | 1.86 | 1.29 | 0.89 | 1.61 | 2.01 | 2.18 | 3.79 | 5.21 | 5.93 | 7.41 | | | | | | | | |
| 6.33 | 5.24 | 5.03 | 4.81 | 4.27 | 0.44 | 1.19 | 0.73 | 1.52 | 5.93 | 5.94 | 7.10 | 8.32 | 9.80 | 11.46 | 11.77 | **14.00** | **13.57** | **12.56** | **11.51** | **8.75** | **7.15** | **5.94** | **5.30** |
| 3.24 | 4.96 | 6.49 | 5.80 | 7.19 | 6.55 | 4.13 | 4.80 | 3.92 | 8.52 | 12.40 | 17.23 | 25.37 | 23.65 | 26.62 | 27.81 | **20.96** | **16.45** | **11.49** | **5.74** | **3.56** | **2.56** | **0.93** | **0.29** |
| 9.98 | 15.46 | 17.50 | 8.66 | 9.79 | 2.52 | -3.42 | 2.49 | 1.58 | 8.69 | 14.82 | 24.42 | 41.87 | 31.21 | 35.50 | 36.44 | . | . | . | . | . | . | . | . |
| 1.43 | 2.18 | 3.57 | 5.04 | 6.46 | 7.75 | 6.40 | 5.43 | 4.60 | 8.47 | 11.74 | 15.32 | 20.69 | 21.50 | 24.14 | 25.33 | . | . | . | . | . | . | . | . |
| 3.27 | 3.22 | 3.37 | 3.45 | 3.26 | 1.40 | 1.57 | 1.03 | 1.06 | 2.70 | 3.03 | 3.44 | 5.31 | 6.84 | 8.33 | 9.99 | . | . | . | . | . | . | . | . |
| 3.24 | 3.34 | 3.66 | 3.78 | 3.64 | 2.17 | 2.33 | 1.88 | 1.67 | 3.36 | 3.79 | 4.42 | 6.93 | 8.41 | 10.04 | 11.55 | . | . | . | . | . | . | . | . |
| 2.41 | 2.65 | 2.92 | 3.10 | 2.99 | 1.65 | 1.67 | 1.11 | 0.94 | 1.87 | 2.28 | 2.49 | 4.51 | 6.06 | 7.49 | 9.51 | **10.29** | **10.73** | **10.04** | **8.69** | **7.06** | **5.48** | **4.47** | **3.77** |
| 2.97 | 3.07 | 3.32 | 3.44 | 3.30 | 1.74 | 1.86 | 1.34 | 1.22 | 2.64 | 3.03 | 3.45 | 5.58 | 7.10 | 8.62 | 10.35 | . | . | . | . | . | . | . | . |
| 3,135 | 3,242 | 3,337 | 3,413 | 3,532 | 3,850 | 3,731 | 3,661 | 3,556 | 3,696 | 3,847 | 3,880 | 3,913 | 3,916 | 4,382 | 4,805 | , | , | , | , | , | , | , | , |
| 2.3 | 3.3 | 4.1 | 4.8 | 5.1 | 10.9 | 5.9 | 2.5 | -0.6 | 2.9 | 4.3 | 3.7 | 2.9 | 1.5 | 8.0 | 14.2 | **10.0** | **6.3** | **3.8** | **1.8** | **0.5** | **-0.3** | **0.0** | **-0.8** |
| 3.2 | 3.2 | 3.3 | 3.1 | 0.3 | -16.4 | -8.5 | -3.6 | 1.7 | 18.1 | 13.8 | 10.5 | 8.6 | 12.6 | 7.1 | **4.1** | **1.8** | **0.4** | **-0.9** | **-0.4** | **0.7** | **1.1** | **1.2** | **1.3** |
| 3.3 | 4.3 | 4.5 | 5.1 | 4.3 | -12.7 | -7.7 | -0.3 | 2.8 | 23.1 | 19.3 | 12.3 | 11.9 | 12.9 | 6.7 | **4.3** | . | . | . | . | . | . | . | . |
| 2.5 | 3.8 | 4.5 | 5.4 | 4.9 | -15.3 | -8.8 | -0.5 | 2.0 | 25.7 | 20.6 | 13.2 | 12.1 | 14.8 | 7.8 | **4.4** | . | . | . | . | . | . | . | . |
| 6.4 | 5.7 | 5.0 | 4.0 | -0.2 | -1.5 | -1.5 | 0.8 | 7.5 | 12.2 | 14.0 | 7.8 | 8.3 | 3.8 | 1.3 | **5.0** | . | . | . | . | . | . | . | . |
| 9.5 | 3.6 | 4.6 | -5.1 | -12.1 | -35.3 | -17.2 | -17.3 | -2.8 | 31.0 | 7.9 | 18.1 | 15.5 | 21.1 | 21.1 | **11.6** | . | . | . | . | . | . | . | . |
| 7.6 | 3.8 | 1.4 | -3.5 | -10.7 | -39.9 | -24.6 | -17.5 | -4.8 | 35.6 | 11.3 | 10.1 | 8.0 | 12.3 | 16.3 | **10.2** | . | . | . | . | . | . | . | . |
| -5.4 | -9.9 | -8.7 | -11.5 | -20.8 | -42.3 | -31.2 | -27.1 | 12.7 | 36.6 | 19.1 | 26.0 | -1.9 | 1.4 | 15.3 | **8.7** | . | . | . | . | . | . | . | . |
| 13.3 | -0.9 | -0.2 | -6.3 | -11.6 | -47.1 | -35.0 | -29.8 | -21.4 | 24.3 | -3.5 | 0.3 | -2.7 | 2.6 | 11.8 | **6.6** | . | . | . | . | . | . | . | . |
| 14.3 | 21.6 | 10.0 | 3.5 | -4.1 | -37.4 | -9.4 | -0.1 | 6.6 | 50.1 | 19.6 | 9.2 | 25.5 | 26.4 | 22.5 | **17.6** | . | . | . | . | . | . | . | . |
| 5.8 | 9.9 | 14.7 | 1.5 | 1.7 | 1.1 | -7.8 | -1.6 | 8.7 | 5.4 | 1.2 | -0.6 | -10.8 | -10.7 | -5.3 | **-3.0** | . | . | . | . | . | . | . | . |
| -0.9 | -0.9 | -1.1 | 0.3 | -2.2 | -18.7 | -13.0 | -8.9 | -3.6 | 14.3 | 16.3 | 15.8 | 16.8 | 18.2 | 16.3 | **11.7** | . | . | . | . | . | . | . | . |
| 4.5 | 3.7 | 4.9 | 2.9 | 0.8 | -17.9 | -9.5 | -3.2 | 1.6 | 24.4 | 17.8 | 12.7 | 13.0 | 14.0 | 9.7 | **7.3** | . | . | . | . | . | . | . | . |
| 5.1 | 8.7 | 2.2 | -3.3 | -7.2 | -31.8 | -28.2 | -23.4 | -10.6 | 15.4 | 25.8 | 35.7 | 18.3 | 30.3 | 14.4 | **3.0** | . | . | . | . | . | . | . | . |
| 11.6 | 9.0 | 11.0 | -1.3 | -6.2 | -33.7 | -25.8 | -16.0 | -2.9 | 47.5 | 42.0 | 36.8 | 36.6 | 28.8 | 23.2 | **11.4** | . | . | . | . | . | . | . | . |
| -0.2 | 0.0 | 0.2 | 0.3 | -0.3 | -3.7 | -5.9 | -7.1 | -7.0 | -4.5 | -2.5 | -1.1 | -0.1 | 1.4 | 2.3 | **2.5** | **2.2** | **1.6** | **0.7** | **-0.1** | **-0.5** | **-0.9** | **-1.1** | **-1.4** |
| 0.8 | 2.8 | 0.5 | 1.0 | -0.6 | -24.2 | -7.1 | 0.2 | 5.8 | 29 | 19.3 | 12.4 | 12.5 | 21.2 | 6.7 | . | . | . | . | . | . | . | . | . |
| 6.6 | 7.4 | 9.4 | 8.9 | 6.3 | -14.8 | -3.6 | 5.5 | 4.4 | 19.1 | 15.5 | 10.2 | 12.3 | 21.2 | 5.3 | . | . | . | . | . | . | . | . | . |
| -1.9 | 6.6 | 4.9 | 24.1 | -13.8 | -1.9 | -3.6 | -4.6 | 13.3 | -24.7 | -1.9 | -18.8 | -16.3 | 9.7 | -18.2 | -17.0 | . | . | . | . | . | . | . | . |
| 5.3 | 3.2 | 1.4 | -0.2 | -2.1 | -15.7 | -15.4 | -14.1 | -14.6 | -5.1 | -0.1 | -1.7 | -0.1 | 5.1 | 1.2 | . | . | . | . | . | . | . | . | . |
| 10.8 | 10.6 | 11.1 | 11.0 | 11.8 | 21.1 | 18.2 | 15.5 | 14.6 | 15.3 | 12.6 | 12.6 | 12.0 | 11.2 | 10.8 | **10.7** | **10.9** | **11.3** | **11.5** | **11.5** | . | . | . | . |
| 58.4 | 57.8 | 57.3 | 57.5 | 55.6 | 44.5 | 49.1 | 52.6 | 52.7 | 52.0 | 53.6 | 54 | 55.9 | 56.7 | 57.0 | . | . | . | . | . | . | . | . | . |
| 65.4 | 64.6 | 64.5 | 64.5 | 63.1 | 56.4 | 60.0 | 62.2 | 61.7 | 61.3 | 61.3 | 61.8 | 63.5 | 63.8 | 63.9 | . | . | . | . | . | . | . | . | . |
| | | | | | | | | | | | | | | | | | | | | . | . | . | . |
| 11.7 | 11.4 | 11.3 | 11.6 | 11.8 | 25.2 | 21.8 | 17.3 | 16.7 | 16.8 | 14.0 | 13.2 | 12.1 | 11.4 | 11.1 | **10.4** | **10.6** | **10.9** | **11.2** | **11.1** | . | . | . | . |
| 58.7 | 58.8 | 58.7 | 58.7 | 56.9 | 44.1 | 49.0 | 53.4 | 53.3 | 53.1 | 54.4 | 54.5 | 57.4 | 57.9 | 58.4 | . | . | . | . | . | . | . | . | . |
| 66.5 | 66.4 | 66.2 | 66.5 | 64.5 | 59.0 | 62.6 | 64.6 | 64.0 | 63.8 | 63.3 | 62.7 | 65.3 | 65.3 | 65.7 | . | . | . | . | . | . | . | . | . |
| -3,821 | -3,218 | -4,302 | -3,466 | -2,324 | -1,984 | -2,033 | -3,005 | -3,101 | -4,050 | -4,857 | -5,988 | -5,419 | -4,858 | -6,177 | . | . | . | . | . | . | . | . | . |
| -4.8 | -4.1 | -5.3 | -4.1 | -3.2 | -3.6 | -3.1 | -4.0 | -4.1 | -5.6 | -6.1 | -6.9 | -6.5 | -5.4 | -7.2 | . | . | . | . | . | . | . | . | . |
| -3,137 | -2,997 | -4,405 | -3,606 | -3,098 | -2,651 | -3,262 | -4,079 | -3,684 | -5,025 | -5,281 | -6,058 | -4,998 | -3,166 | -4,570 | . | . | . | . | . | . | . | . | . |
| -2,616 | -2,502 | -2,301 | -2,298 | -1,398 | -1,051 | -1,193 | -1,402 | -1,867 | -1,652 | -2,339 | -2,865 | -3,598 | -4,606 | -4,702 | . | . | . | . | . | . | . | . | . |
| 1,932 | 2,281 | 2,404 | 2,438 | 2,173 | 1,718 | 2,422 | 2,475 | 2,450 | 2,627 | 2,763 | 2,935 | 3,177 | 2,914 | 3,096 | . | . | . | . | . | . | . | . | . |
| -3,520 | -3,333 | -3,740 | -2,706 | -1,750 | -1,949 | -1,868 | -2,594 | -2,609 | -3,761 | -4,504 | -5,640 | -4,790 | -4,995 | -5,662 | . | . | . | . | . | . | . | . | . |
| -4.4 | -4.2 | -4.6 | -3.2 | -2.4 | -3.5 | -2.8 | -3.4 | -3.5 | -5.2 | -5.7 | -6.5 | -5.7 | -5.6 | -6.6 | . | . | . | . | . | . | . | . | . |
| -2,652 | -3,626 | -1,678 | -2,880 | -1,939 | -1,736 | -269 | -1,829 | -1,258 | -1,013 | -2,528 | -1,402 | -3,672 | -3,640 | -3,071 | . | . | . | . | . | . | . | . | . |
| 3,394 | 4,090 | 3,163 | 3,342 | 3,175 | 1,371 | 844 | 2,069 | 2,127 | 1,997 | 2,707 | 2,550 | 5,053 | 5,120 | 3,317 | . | . | . | . | . | . | . | . | . |
| 741 | 465 | 1,485 | 462 | 1,236 | -365 | 575 | 240 | 869 | 984 | 179 | 1,149 | 1,379 | 1,480 | 246 | . | . | . | . | . | . | . | . | . |
| -1,382 | -282 | 137 | 1,551 | -168 | -3,429 | 323 | 1,506 | 1,319 | -6,089 | 851 | -675 | 1,916 | -762 | -246 | . | . | . | . | . | . | . | . | . |
| -1,836 | 48 | -2,453 | -1,579 | 528 | 627 | -2,127 | -3,976 | -2,860 | 3,167 | -2,981 | -3,697 | -3,161 | -667 | -2,504 | . | . | . | . | . | . | . | . | . |
| 2,351 | 526 | 254 | 202 | -171 | 2,590 | 205 | 1,705 | 190 | 174 | 154 | 135 | 127 | 74 | 159 | . | . | . | . | . | . | . | . | . |
| 301 | -115 | 562 | 760 | 574 | 35 | 165 | 411 | 492 | 290 | 353 | 348 | 629 | -137 | 514 | . | . | . | . | . | . | . | . | . |
| 4.25 | 4.25 | 4.25 | 4.25 | 4.23 | 3.26 | 2.24 | 1.75 | 1.75 | 1.75 | 1.75 | 2.40 | 3.69 | 5.68 | 8.56 | 10.85 | . | . | . | . | . | . | . | . |
| | | | | | | | | | | | | | | | | **12.69** | **13.00** | **12.67** | **11.17** | **9.67** | **8.67** | **7.67** | **6.67** |
| 4.3 | 4.3 | 4.3 | 4.3 | 4.2 | 3.2 | 2.2 | 1.7 | 1.7 | 1.7 | 1.8 | 2.4 | 3.7 | 5.7 | 8.6 | 10.9 | . | . | . | . | . | . | . | . |
| 9.1 | 9.0 | 8.9 | 8.5 | 8.4 | 8.3 | 7.0 | 6.2 | 6.0 | 5.7 | 6.0 | 6.9 | 8.6 | 10.8 | 14.2 | 17.8 | . | . | . | . | . | . | . | . |
| 18.0 | 17.2 | 16.0 | 15.5 | 15.8 | 15.5 | 14.8 | 14.2 | 14.0 | 13.7 | 14.3 | 14.8 | 16.7 | 19.1 | 22.9 | 27.2 | . | . | . | . | . | . | . | . |
| 10.4 | 10.5 | 10.4 | 10.4 | 10.4 | 10.4 | 10.2 | 9.6 | 9.2 | 8.9 | 9.0 | 9.3 | 9.9 | 11.5 | 13.4 | 16.4 | . | . | . | . | . | . | . | . |

# Annex 3
# **Predictive densities for other relevant macroeconomic forecasting variables**

### Graph A3.1
### Quarterly assumptions of 12-month growth of trading partners based on annual projections, predictive density [a/]

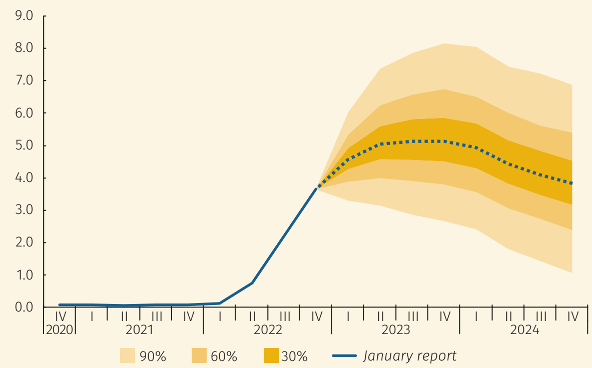
(Annual change)




a/ The graph displays the probability distribution and its most likely path on an eight-quarter forecast horizon. Densities characterize the balance of potential risks with areas of 30%, 60% and 90% probability around the central forecast (mode).
Source: calculations and projections by *Banco de la República.*

### Graph A3.3
### U.S. Federal Reserve quarterly interest rate assumption, predictive density [a/]

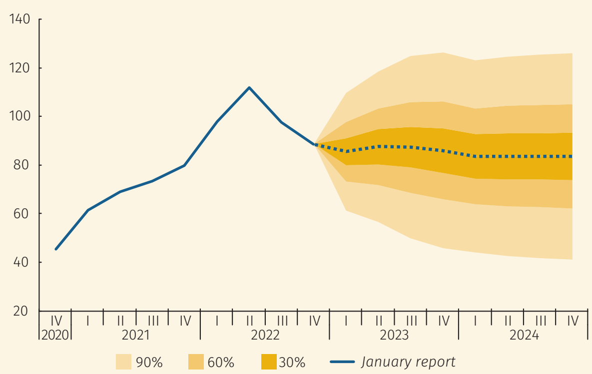
(Percentage)




a/ The graph displays the probability distribution and its most likely path on an eight-quarter forecast horizon. Densities characterize the balance of potential risks with areas of 30%, 60% and 90% probability around the central forecast (mode).
Source: Federal Reserve Bank of St. Louis, calculations and projections by *Banco de la República.*

### Graph A3.2
### Quarterly oil price assumption, predictive density [a/]

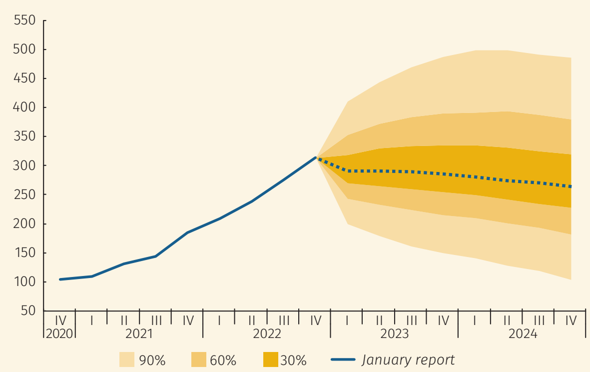
(USD per barrel)




a/ The graph displays the probability distribution and its most likely path on an eight-quarter forecast horizon. Densities characterize the balance of potential risks with areas of 30%, 60% and 90% probability around the central forecast (mode).
Source: Bloomberg, calculations and projections by *Banco de la República.*

### Graph A3.4
### Colombia's quarterly risk premium (CDS) assumption, predictive density [a/ b/]

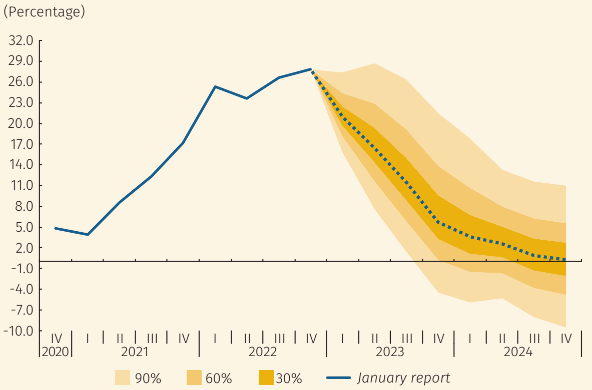
(Basis points)




a/ Five-year credit default swaps
b/ The graph displays the probability distribution and its most likely path on an eight-quarter forecast horizon. Densities characterize the balance of potential risks with areas of 30%, 60% and 90% probability around the central forecast (mode).
Source: Bloomberg, calculations and projections by *Banco de la República.*

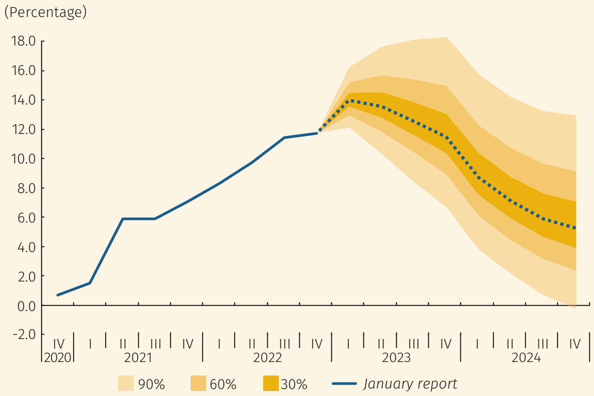
# Annex 3 (continuation)
# **Predictive densities for other relevant macroeconomic forecasting variables**

Graph A3.5
CPI for foods, predictive density [a/]
(Annual change, end-of-period)




a/ The graph displays the probability distribution and its most likely path for 2022 and 2023. Densities characterize the balance of potential risks with areas of 30%, 60% and 90% probability around the central forecast (mode), using primarily as reference the densities from the *Patacon* model.
Source: calculations and projections by *Banco de la República*.

Graph A3.6
CPI for regulated items, predictive density [a/]
(Annual change, end-of-period)




a/ The graph displays the probability distribution and its most likely path for 2022 and 2023. Densities characterize the balance of potential risks with areas of 30%, 60% and 90% probability around the central forecast (mode), using primarily as reference the densities from the Patacon model.
Source: calculations and projections by *Banco de la República*.