

July 2022

# MONETARY POLICY REPORT

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\* Presented by the technical staff  
to the Board of Directors for its  
meeting on 29 July 2022.

*Banco de la República*  
Bogotá, D. C. (Colombia)

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ISSN - 2711 - 2128



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# Monetary Policy in Colombia

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*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<sup>1</sup>. 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  $\pm 1$  percentage point range outside its inflation target (i.e.,  $3.0 \pm 1$  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 the BDBR uses 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<sup>2</sup>, 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)<sup>3</sup>. 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)<sup>4</sup>, 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<sup>5</sup> seeks to deliver relevant and up-to-date information to contribute to better decision-making by the agents of the economy.

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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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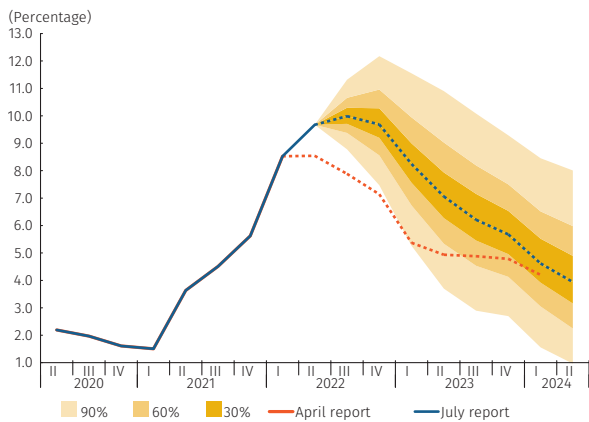
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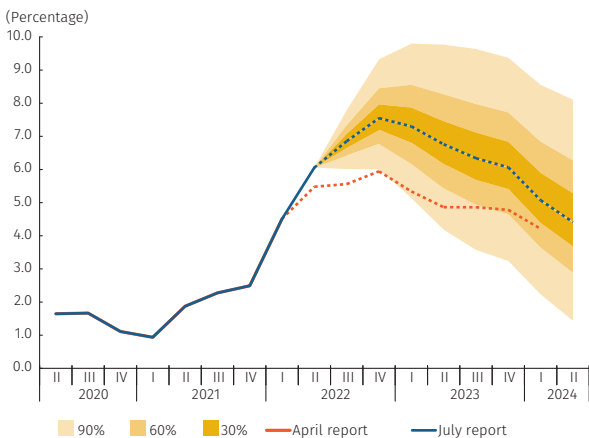
# 1. Summary

**Graph 1.1**  
Consumer Price Index <sup>a/, b/</sup>  
(annual change, end-of-period)



a/ This graph displays 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 4GM monetary policy models.  
b/ The probability distribution applies to the forecast exercise from the July report.  
Source: DANE; Banco de la República calculations and projections.

**Graph 1.2**  
CPI excluding foods and regulated items <sup>a/, b/</sup>  
(annual change, end-of-period)



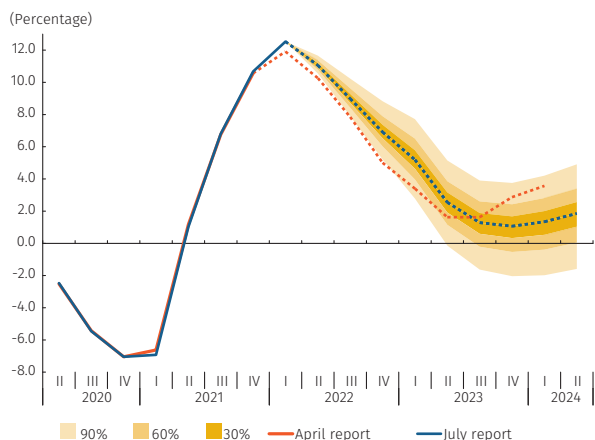
a/ This graph displays the forecast probability distribution on an eight-quarter time horizon. Density characterizes the prospective balance of risks with areas of 30%, 60%, and 90% probability surrounding the central forecast (mode), through a combination of densities from the Patacon and 4GM monetary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

## 1.1 Macroeconomic summary

**In the second quarter, annual inflation (9.67%), the technical staff’s projections and its expectations continued to increase, remaining above the target.** International cost shocks, accentuated by Russia’s invasion of Ukraine, have been more persistent than projected, thus contributing to higher inflation. The effects of indexation, higher than estimated excess demand, a tighter labor market, inflation expectations that continue to rise and currently exceed 3%, and the exchange rate pressures add to those described above. High core inflation measures as well as in the producer price index (PPI) across all baskets confirm a significant spread in price increases. Compared to estimates presented in April, the new forecast trajectory for headline and core inflation increased (Graph 1.1 and 1.2). This was partly the result of greater exchange rate pressure on prices, and a larger output gap, which is expected to remain positive for the remainder of 2022 and which is estimated to close towards yearend 2023. In addition, these trends take into account an indexation process to higher inflation rates, more persistent above-target inflation expectations, a quickening of domestic fuel price increases due to the correction of lags versus the parity price and higher international oil price forecasts. The forecast supposes a good domestic supply of perishable foods, although it also considers that international prices of processed foods will remain high. In terms of the goods sub-basket, the end of the national health emergency implies a reversal of the value-added tax (VAT) refund applied to health and personal hygiene products, resulting in increases in the prices of these goods. Alternatively, the monetary policy tightening and the moderation of external shocks would help inflation and its expectations to begin to decrease over time and resume their alignment with the target. Thus, the new projection suggests that inflation would remain high for the second half of 2022, closing at 9.7%. However, it would begin to fall during 2023, closing the year at 5.7% (Graph 1.1). These forecasts are subject to significant uncertainty, especially regarding the future behavior of external cost shocks, the degree of indexation of nominal contracts and decisions made regarding the domestic price of fuels.

**Economic activity continues to outperform expectations, and the technical staff’s growth projections for 2022 have been revised upwards from 5.0% to 6.9% (Chart 1.3). The new**

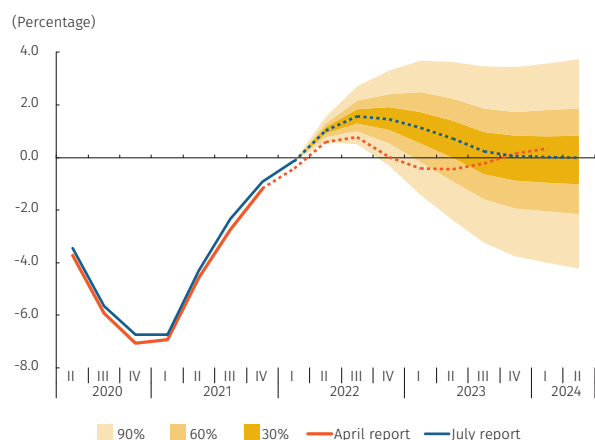
**Graph 1.3**  
Gross domestic product, four-quarter cumulative<sup>a/, b/, c/</sup>  
(annual change)



a/ This graph displays 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 4GM monetary policy models.  
b/ Seasonally adjusted and corrected for calendar effects.  
c/ The probability distribution applies to the forecast exercise from the July report.  
Source: DANE; Banco de la República calculations and projections.

**forecasts suggest higher output levels that would continue to exceed the economy's productive capacity for the remainder of 2022.** Economic growth during the first quarter was above that estimated in April, while economic activity indicators for the second quarter suggest that the GDP could be expected to remain high, potentially above that of the first quarter. Domestic demand is expected to maintain a positive dynamic, in particular, due to the household consumption quarterly growth, as suggested by vehicle registrations, retail sales, credit card purchases and consumer loan disbursement figures. A slowdown in the machinery and equipment imports from the levels observed in March contrasts with the positive performance of sales and housing construction licenses, which indicates an investment level similar to that registered for the first three months of the year. International trade data suggests the trade deficit would be reduced as a consequence of import levels that would be lesser than those observed in the first quarter, and stable export levels. For the remainder of the year and 2023, a deceleration in consumption is expected from the high levels seen during the first half of the year, partially as a result of lower repressed demand, tighter domestic financial conditions and household available income deterioration due to increased inflation. Investment is expected to continue its slow recovery while remaining below pre-pandemic levels. The trade deficit is expected to tighten due to projected lower domestic demand dynamics, and high prices of oil and other basic goods exported by the country. Given the above, economic growth in the second quarter of 2022 would be 11.5%, and for 2022 and 2023 an annual growth of 6.9% and 1.1% is expected, respectively (Graph 1.3). Currently, and for the remainder of 2022, the output gap would be positive and greater than that estimated in April, and prices would be affected by demand pressures (Chart 1.4). These projections continue to be affected by significant uncertainty associated with global political tensions, the expected adjustment of monetary policy in developed countries, external demand behavior, changes in country risk outlook, and the future developments in domestic fiscal policy, among others.

**Graph 1.4**  
Output gap<sup>a/, b/, c/</sup>  
(four-quarter cumulative)



a/ The historical output gap estimate is calculated as the difference between observed GDP (four-quarter cumulative) and potential GDP (trend; four-quarter cumulative) based on the 4GM model. The forecast 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.  
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 4GM monetary policy models.  
c/ The probability distribution applies to the forecast exercise from the January report.  
Source: DANE; Banco de la República calculations and projections.

**The high inflation levels and respective expectations, which exceed the target of the world's main central banks, largely explain the observed and anticipated increase in their monetary policy interest rates. This environment has tempered the growth forecast for external demand.** Disruptions in value chains, rising international food and energy prices, and expansionary monetary and fiscal policies have contributed to the rise in inflation and above-target expectations seen by several of Colombia's main trading partners. These cost and price shocks, heightened by the effects of Russia's invasion of Ukraine, have been more prevalent than expected and have taken place within a set of output and employment recovery, variables that in some countries currently equal or exceed their projected long-term levels. In response, the U.S. Federal Reserve accelerated the

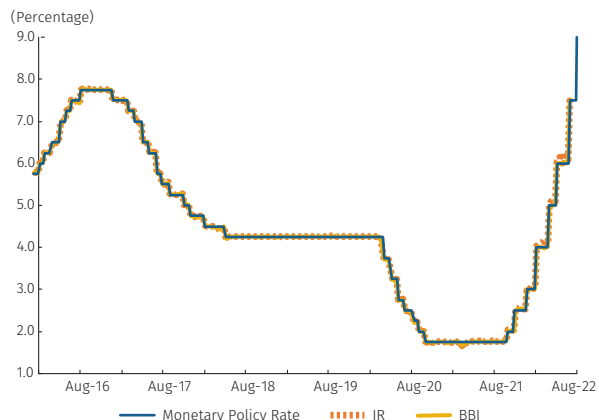
pace of the benchmark interest rate increase and rapidly reduced liquidity levels in the money market. Financial market actors expect this behavior to continue and, consequently, significantly increase their expectations of the average path of the Fed's benchmark interest rate. In this setting, the U.S. dollar appreciated versus the peso in the second quarter and emerging market risk measures increased, a behavior that intensified for Colombia. Given the aforementioned, for the remainder of 2022 and 2023, the Bank's technical staff increased the forecast trajectory for the Fed's interest rate and reduced the country's external demand growth forecast. The projected oil price was revised upward over the forecast horizon, specifically due to greater supply restrictions and the interruption of hydrocarbon trade between the European Union and Russia. Global geopolitical tensions, a tightening of monetary policy in developed economies, the increase in risk perception for emerging markets and the macroeconomic imbalances in the country explain the increase in the projected trajectory of the risk premium, its trend level and the neutral real interest rate<sup>1</sup>. Uncertainty about external forecasts and their consequent impact on the country's macroeconomic scenario remains high, given the unpredictable evolution of the conflict between Russia and Ukraine, geopolitical tensions, the degree of the global economic slowdown and the effect the response to recent outbreaks of the pandemic in some Asian countries may have on the world economy.

**This macroeconomic scenario that includes high inflation, inflation forecasts, and expectations above 3% and a positive output gap suggests the need for a contractionary monetary policy that mitigates the risk of the persistent unanchoring of inflation expectations.** In contrast to the forecasts of the April report, the increase in the risk premium trend implies a higher neutral real interest rate and a greater prevailing monetary stimulus than previously estimated. For its part, domestic demand has been more dynamic, with a higher observed and expected output level that exceeds the economy's productive capacity. The surprising accelerations in the headline and core inflation reflect stronger and more persistent external shocks, which, in combination with the strength of aggregate demand, indexation, higher inflation expectations and exchange rate pressures, explain the upward projected inflation trajectory at levels that exceed the target over the next two years. This is corroborated by the inflation expectations of economic analysts and those derived from the public debt market, which continued to climb and currently exceed 3%. All of the above increase the risk of unanchoring inflation expectations and could generate widespread indexation processes that may push inflation away from the target for longer. This

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1 The neutral real interest rate refers to the real interest rate level that is neither stimulative nor contractionary for aggregate demand and, therefore, does not generate pressures that lead to the close of the output gap. In a small, open economy like Colombia, this rate depends on the external neutral real interest rate, medium-term components of the country risk premium, and expected depreciation.

**Graph 1.5**  
**Monetary policy interest rate, interbank rate and BBI<sup>a/</sup>**  
**(weekly data)**



a/ IR: interbank rate; BBI: benchmark banking indicator.  
 Sources: Office of the Financial Superintendent of Colombia and *Banco de la República*.

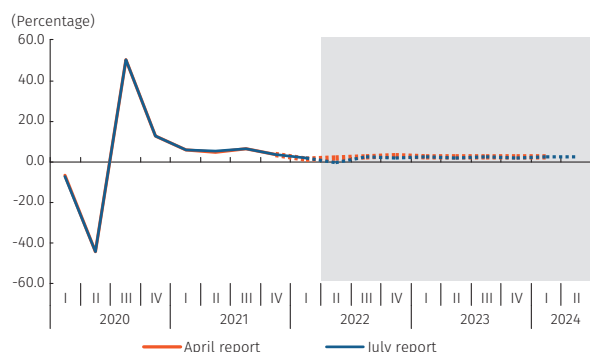
new macroeconomic scenario suggests that the interest rate adjustment should continue towards a contractionary monetary policy stance.

**1.2 Monetary policy decision**

*Banco de la República’s* Board of Directors (BDBR), at its meetings in June and July 2022, decided to continue adjusting its monetary policy. At its June meeting, the BDBR decided to increase the monetary policy rate by 150 basis points (b.p.) and its July meeting by majority vote, on a 150 b.p. increase thereof at its July meeting. Consequently, the monetary policy interest rate currently stands at 9.0% (Graph 1.5).

## 2. Macroeconomic Forecasts and Risk Analysis

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



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

Table 2.1  
Economic growth among main trade partners<sup>a/</sup>

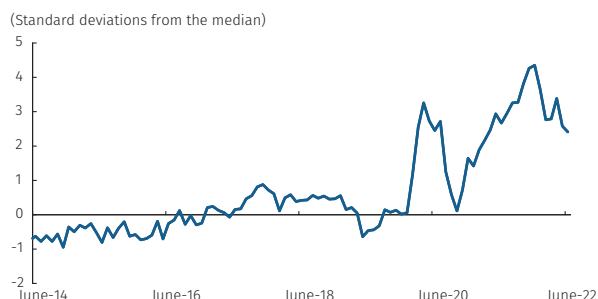
Main Partners	2021 (pre)	2022 (proj)	2023 (proj)
United States	5.7	2.1	1.5
Euro area	5.3	2.4	1.8
China	8.1	3.8	5.1
Ecuador	4.2	2.4	2.1
Brazil	4.6	1.0	1.0
Peru	13.3	2.7	2.9
Mexico	4.8	1.8	1.8
Chile	11.7	1.7	0.3
TWA trade partners <sup>a/</sup>	7.0	2.4	2.0

(pre): preliminary, (proj): projected

a/ Weighted average based on goods trade contribution.

Sources: Bloomberg, Focus Economics, statistics offices and central banks (observed data), calculations and projections by Banco de la República.

Graph 2.2  
Index of global supply chain pressures<sup>a/</sup>



a/ Authors used international transportation cost indices (Baltic Dry, HARPEX, among others) and some components from the Purchasing Managers Index (PMI) for the Euro-zone, China, Japan, South Korea, Taiwan, the UK and the U.S.  
Source: 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*, January 4, 2022.

### 2.1 International outlook

#### 2.1.1. Foreign demand

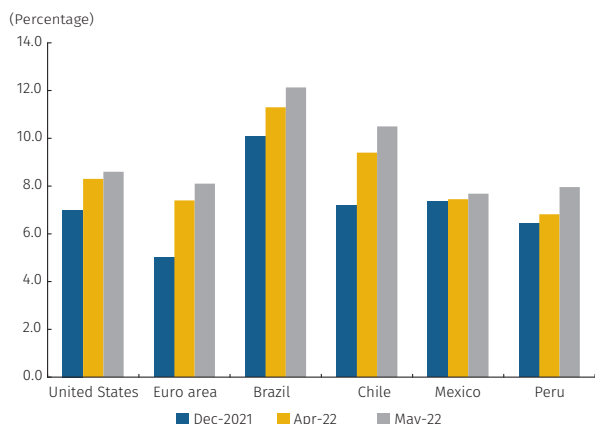
**For 2022 and 2023, the expected foreign demand growth for Colombian exports was revised downwards.** In the first quarter of the year, the economic recovery of the country's main trade partners continued at a similar pace to that estimated in the April report, although at a slower speed than that registered during the second half of 2021 (Graph 2.1). During the second quarter, Russia's invasion of Ukraine continued to generate inflationary pressures and erode global growth prospects.<sup>2</sup> The euro area in particular faces the risk that the current energy crisis may worsen due to natural gas supply problems. Likewise, strict measures to contain Covid-19 in China have generated additional pressures on global supply chains (Graph 2.2). Moreover, there is also high global inflation, expectations of greater monetary policy adjustments in the United States and other economies, interest rate increases in international markets and a heightened perception of global risk. Given all the above, the expected average growth of the country's main trade partners was revised downwards from the outlook in the previous report, from 2.8% to 2.4% in 2022 and from 2.4% to 2.0% in 2023 (Table 2.1). There is high uncertainty regarding this expectation and, as noted in Section 2.3, the risk balance tilts downwards with stagflation scenarios in various economies or recession scenarios in countries such as the United States and the euro area that could materialize.

**This report considers a worsening in the growth forecasts for the United States and the euro area, in a setting of growing concern around an economic recession.** After poor growth at the beginning of the year,<sup>3</sup> during the second quarter, the fall in real income due to heightened inflation and low consumer confidence in these countries (Graphs 2.3 and 2.4) would have impacted the performance of domestic demand and would continue affecting it during the coming quarters. In turn, financial conditions have continued to deteriorate, and the normalization of monetary policy has been more rapid and is expected to be more restrictive in the forecast horizon versus the expectations of previous months. This would be partially

2 For 2022 and 2023, the World Bank revised downward its economic growth forecast from 4.4% to 3.1% and from 3.6% to 3.4%, respectively. The International Monetary Fund (IMF) updated its projections with a downward revision from 3.6% to 3.2% for 2022 and from 3.6% to 2.9% for 2023.

3 In the first quarter of the year, quarterly GDP growth in the United States fell (-0.36%) while in the euro area it continued to grow, albeit at a low rate (0.48%). The former is an important factor in explaining the slow-down in average GDP of the trading partners for that period.

**Graph 2.3**  
Headline Inflation, main trading partners

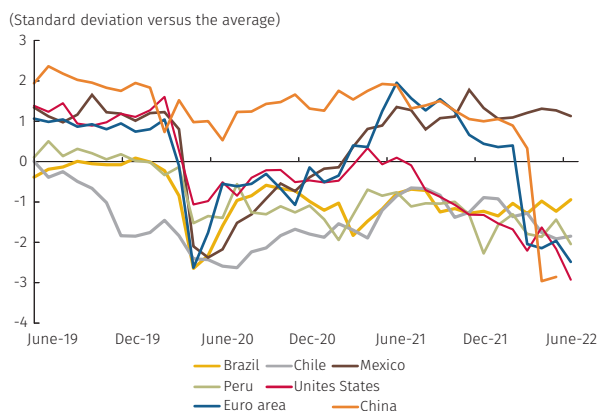


Source: Bloomberg.

offset by fewer health restrictions and low unemployment rates.<sup>4</sup> Additionally, business conditions in the manufacturing sector (measured by the PMI) suggest a slowdown in the short term. Finally, the deceleration of foreign demand is expected, in line with lower growth prospects for their main trade partners. Given the above, economic growth for 2022 was revised down from 3.1% to 2.1% in the United States and from 2.2% to 1.7% in the euro area. There is a high degree of uncertainty regarding these projections and a further downturn is not ruled out due to energy supply problems in Europe and the impact of a further tightening of monetary policy in the United States to control inflation.

**In the second quarter of 2022, China recorded its second largest GDP contraction since the start of the pandemic.** For this period, a quarterly decline in GDP of 2.6% was recorded. Over this year, first quarter growth was 4.8%, dropping to 0.4% by the second quarter. Strong measures taken to contain the Covid-19 outbreaks affected private consumption dynamics<sup>5</sup> and intensified the disruptions in global supply chains (Graph 2.2). Under these conditions, industrial production slowed on a quarter-on-quarter basis, from 5.0% in the first quarter of the year to 0.6% in the second. Additionally, investment growth declined from that of the previous quarter, while some indicators in the housing sector continued to drop.<sup>6</sup> This sector exhibits persistent financial stress with a high indebtedness level situation. This is exacerbated by weakened foreign demand resulting from the global economic slowdown. Against this backdrop, in recent months the Chinese government has implemented stimulus measures that would partially offset the decline in economic activity. Thus, for 2022, economic growth projections for this country were revised downwards from 4.6% to 3.8%.

**Graph 2.4**  
Monthly consumer confidence index for select countries

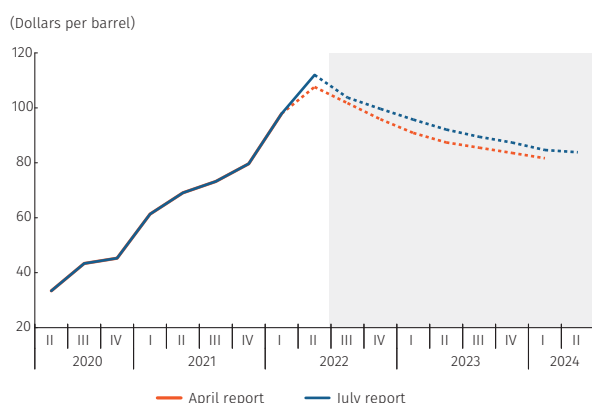


Sources: INEGI, CIF, FVG IBRE, UDD, Fedesarrollo, APOYO and Bloomberg.

**For 2022 and 2023, a restrained growth rate for Colombia’s regional trade partners is still expected.** In the second quarter of the year, the reduction of health restrictions and the gradual recovery of labor markets would have favored the reactivation of private consumption dynamics. However, the lower confidence exhibited by agents and the inflation growth in several of these countries, together with a rapid increase in the monetary policy interest rate and continued political and social uncertainty, would have had an impact on domestic demand (Graphs 2.3 and 2.4.) Furthermore, there have recently been significant drops in the prices of some commodities exported by these economies that could impact the terms of

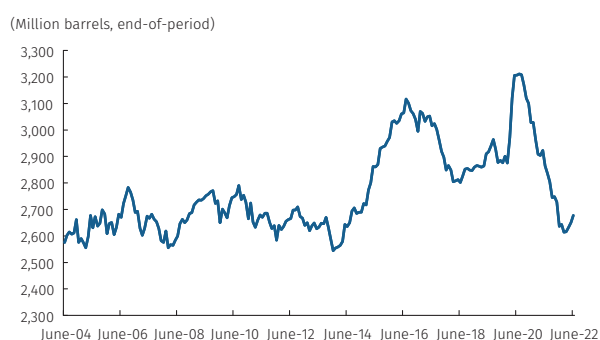
4 In the euro area, fiscal measures have also been implemented to mitigate the impact on households of high energy prices.  
 5 In the second quarter of 2022, retail sales registered year-to-year drops in April (-11.1%) and May (-6.7%). In turn, consumer confidence hit record lows and the unemployment rate increased versus that of the first quarter.  
 6 In May, new constructions of residential housing continued to register significant cumulative annual declines (-31.9%).

**Graph 2.5**  
Assumed quarterly oil price



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

**Graph 2.6**  
OECD end-of-period commercial crude oil and other liquids inventory, monthly



Sources: U.S. Energy Information Administration, July 2022 Short-Term Energy Outlook (STEO).

trade, while demand for their exports would be affected by the lower expected growth of the world's main economies, such as the United States and China. Likewise, factors such as the higher costs of external financing, the pressures on public finances, high global uncertainty and the greater perception of risk for emerging markets would continue to restrain economic activity. Considering all of the above, the 2022 economic growth projection for Chile, Ecuador, Peru and Mexico was revised downwards, while the outlook for Brazil has improved given its surprising first quarter growth upturn, while for the second its economic activity indicators continue to exceed expectations.

## 2.1.2 International prices

**Relatively high oil prices are anticipated in the forecast horizon as supply disruptions and low inventory levels (Graph 2.5) continue.** In the second quarter, the average international Brent benchmark price was close to USD 112/barrel (bl), higher than that projected in the April report (USD 108 bl). The observed and expected decrease in Russia's production of crude and its derivatives as a result of sanctions on its oil sector has contributed to the steep oil prices. Prices have also been affected by the difficulties some OPEC+ members faced to meet their extraction commitments and a restrained investment and production response from other nations. The foregoing, together with the low inventory levels<sup>7</sup> (Graph 2.6), explains the upward revision to the international oil price trajectory formulated by the technical staff for this report. However, lower prospective world economic growth would mitigate the upward pressure on prices<sup>8</sup> that, coupled with the prospect of a rebound in world supply from countries other than Russia, would contribute to a decrease in the international price of crude in the forecast horizon. Under this scenario, an average Brent price of USD 103/bl is expected in 2022 and USD 91/bl in 2023,<sup>9</sup> although uncertainty remains high because of the multiple shocks affecting this market.

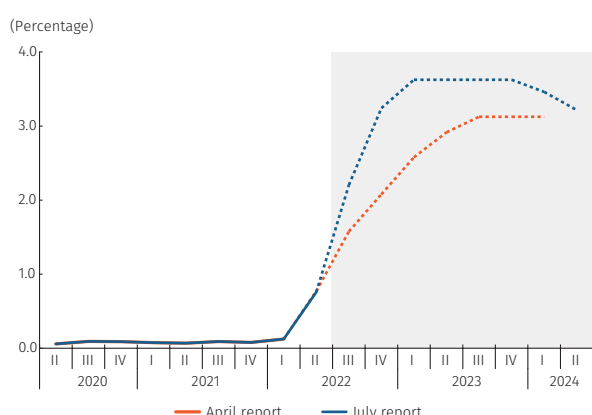
**High observed and expected inflation is a global phenomenon that has intensified in recent months.** According to the Organization for Economic Cooperation and Development (OECD),<sup>10</sup> the higher inflation has resulted from elevated food and energy prices, exacerbated by the Russian invasion of Ukraine and the persistence of supply chain problems.

- 7 During the first semester of the year, commercial inventories of OECD countries fell to their lowest levels since 2014.
- 8 From July 1 to July 20, the Brent benchmark price decreased to around USD 105/bl.
- 9 In the April report, the expectation was USD 101 bl for 2022 and USD 87 bl for 2023.
- 10 OECD (2022). *Economic Outlook*, Vol. 2022, June 2022, OECD Publishing, Paris.

Added to these factors, according to the World Bank,<sup>11</sup> is the firming demand and, in some countries, the tightness of the labor market, as well as increased prices of services associated with housing. In June, headline and core inflation for the United States reached 9.1% and 5.9%, respectively. In that same month, headline annual inflation for the euro area stood at 8.6% and core inflation reached 3.7%. Going forward, the market outlook and those of international organizations indicate that inflation would decrease in these countries but remain above their targets for yearend 2023.<sup>12</sup> High inflation has also been observed in emerging countries, including those in the Latin American region (Graph 2.3), and other developed economies.<sup>13</sup>

### 2.1.3 International financial developments

**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.

**The forecast horizon supposes a higher monetary policy interest rate in the United than that expected in the previous report. (Graph 2.7)** In its June meeting, the Federal Open Market Committee (FOMC) increased the interest rate by 75 bp, its steepest increase since 1994. This decision was larger than that expected by the technical staff in the April report, in this way materializing part of the upside risks noted in that document. Likewise, during the past month, the Fed continued its plan for reducing the size of its Balance Sheet issued in May. This has occurred in a scenario with a relatively low unemployment rate, unexpected inflation increases, and inflation expectations that remain at levels above the target. Consequently, the information resulting from the FOMC projections, the market and futures surveys<sup>14</sup> display an outlook of higher interest rates versus that foreseen months back by the technical staff, which by 2023 would remain above their long-term level. In this way, compared to the April report, the monetary policy interest rate assumption for the U.S. was revised upwards and would lie within the range of 3.5% and 3.75% by yearend 2022, and would remain unchanged

11 World Bank. (2022) *Global Economic Prospects*, June 2022. The World Bank. Washington, DC.

12 In the U.S., the Federal Reserve reported that the median one-year-ahead and median three-year-ahead consumer inflation expectation recorded 6.8% and 3.6%, respectively. For its part, the median of inflation projections for the euro area according to the ECB's analysts survey for July of 2022, increased to 7.5% for the fourth quarter 2022 and 2.4% for the fourth quarter of 2023.

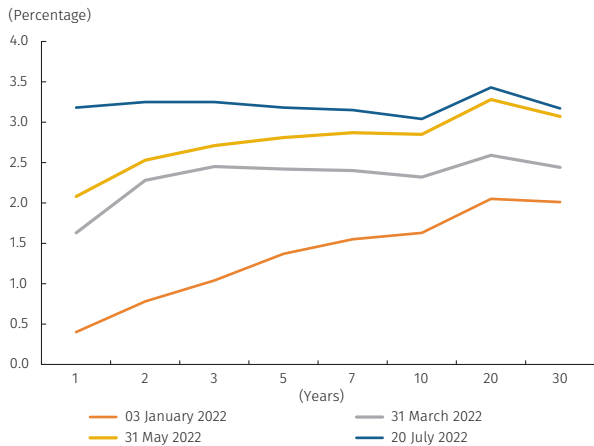
13 Year-on-year inflation in the OECD rose to 9.6% and to 8.8% in the G20 area in May 2022.

14 The median of the FOMC's participants' assessment of the midpoint of the range for the federal funds rate for year-end 2022 and 2023 are 3.38% and 3.75%, respectively; a reduction in this rate (3.38%) is suggested for 2024, although to values above its long run level (2.5%). According to the June 2022 Survey of Primary Dealers (SPD) formulated by the New York Federal Reserve, the median for year-end 2022 increased from 2.38% in May to 2.63% in June. By 2023, the rate is expected to be 3.13%.



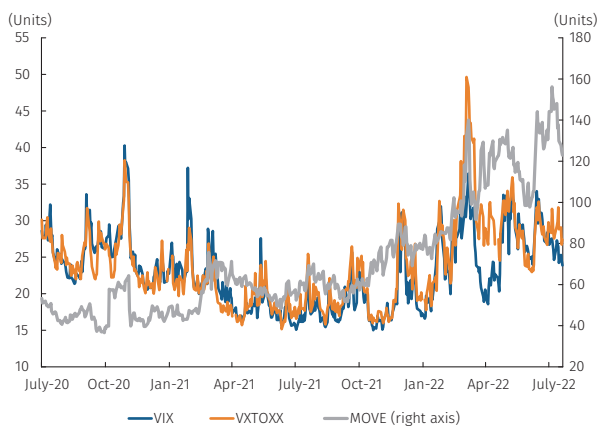
Graph 2.8 U.S. Treasury bonds and risk indicators for select developed economies

A. Daily US Treasury Bonds yield curve



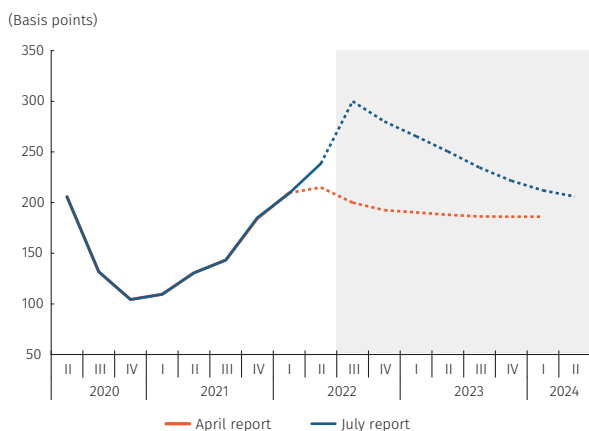
Sources: U.S. Department of the Treasury.

B. Risk indicators in advanced economies



Note: Data to 20 July 2022. Sources: Bloomberg.

Graph 2.9 Colombia's assumed quarterly risk premium (CDS)<sup>a/</sup>



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

throughout 2023.<sup>15</sup> For 2024, reductions are expected that would bring the rate to a range between 3.0% and 3.25% by mid-year, provided inflation approaches its target. For its part, in July the European Central Bank (ECB) increased its three key interest rates by 50 bp after a prolonged period of low interest rates. Additionally, it completed the net asset purchases within the framework of its APP<sup>16</sup> program and began its reinvestment phase. Finally, at this meeting, it also approved the creation of the Transmission Protection Instrument (TPI).<sup>17</sup>

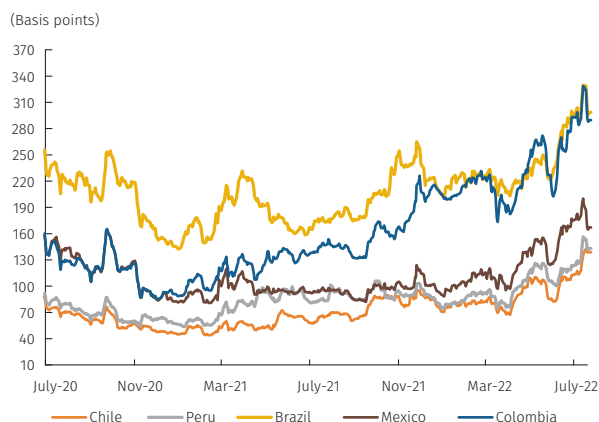
**During the second quarter of 2022, international interest rates were above those observed at the beginning of the year.** During the second quarter of 2022, interest rates on U.S. sovereign debt and this market's volatility increased<sup>18</sup> (Graph 2.8). These securities underwent a yield curve inversion this July to date in an environment of stronger and more persistent inflationary pressures, deteriorating growth projections and stoking fears of an economic recession. Furthermore, international debt markets and the world's main stock exchanges have shown unfavorable behavior year to date. In addition, according to the Institute of International Finance (IIF),<sup>19</sup> in the second quarter of 2022 emerging economies suffered capital outflows related to foreign portfolio investments in equity markets, especially seen in Asia, which were partially offset by fixed income investment inflows in various regions.<sup>20</sup> For Colombia, the data from the local foreign exchange balance indicate capital inflows from foreign portfolio investments worth USD 911 m in the second quarter, a higher figure than the USD 843 m recorded during the first quarter of the year.

**For 2022 and 2023, a higher risk premium is expected compared to that of the April report (Graph 2.9).** On average, for the second quarter of 2022, the primary risk indicators in advanced economies (VIX, VSTOXX) remained relatively high and above those recorded at the end of 2021 (Graph 2.8). For

- 15 By the publication of this report, it was known that, at its meeting on July 27, the FOMC increased the monetary policy interest rate by 75 bp, in line with the technical staff's expectations.
- 16 As of July 1, net asset purchases under the Asset Purchase Program (APP) were discontinued. In this way, the ECB will reinvest the principal payments from maturing securities acquired, as it has done since April, under the Pandemic Emergency Purchase Program (PEPP).
- 17 This instrument is intended to guarantee that monetary policy position is transmitted across all euro area countries and can be initiated to counter unjustified and disorderly market dynamics.
- 18 The interest rates debt securities of other advanced economies also increased on average during the second quarter versus their behavior during the first quarter of 2022. Interest rates for 10-year debt securities rose in Germany by 94 basis points, by 66 bp in the UK and by 98 bp in the U.S.
- 19 IIF (2022). *Capital Flows Tracker*.
- 20 In Latin America, net capital inflows were observed, driven by fixed income market inflows which were partially offset by capital outflows from equity market.

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

#### A. Five-year credit default swaps



#### B. Nominal exchange rate



Note: Data to July 29, 2022

Source: Bloomberg, calculations by Banco de la República.

their part, risk premiums in Latin America increased from the average observed during the first quarter of the year.<sup>21</sup> In Colombia, during the second quarter, five-year credit default swaps increased quarter-on-quarter by 29 bp, reaching an average value of 238 bp (Graph 2.10). This exceeded the technical staff's expectations in the April report (215 bp) reflecting some of the upward risks indicated in that report. So far in the third quarter up to July 20, the exchange rate and the country's risk premium have shown significant increases and high volatility. Specifically, the five-year credit default swaps (CDS) average rose from 252 bp in June to 304 bp in July (up to the 20), while the average exchange rate escalated from COP 3,942 to COP 4,386 per USD. The rise in five-year CDS for Colombia have occurred amid extraordinary global factors, such as the recent upsurges in monetary policy adjustments observed and expected in advanced countries, global uncertainty due to Russia's invasion of Ukraine, fears about an economic recession in markets such as the United States<sup>22</sup> and the euro area, the rise in interest rates and risk premiums in international financial markets, the deterioration of capital flows to emerging countries and the recent drop in oil prices. Added to this are local factors such as fiscal and trade deficits, the level of public indebtedness and the foreign currency debt credit rating below investment grade. Taking the above into account, a higher risk premium is presumed compared to that of the April report, which would reach an average of 257 bp in 2022 and 243 in 2023. The uncertainty surrounding this assumption is high and considers an upside risks balance, as presented in Section 2.3.

## 2.2 Macroeconomic projections<sup>23</sup>

### 2.2.1 Inflation

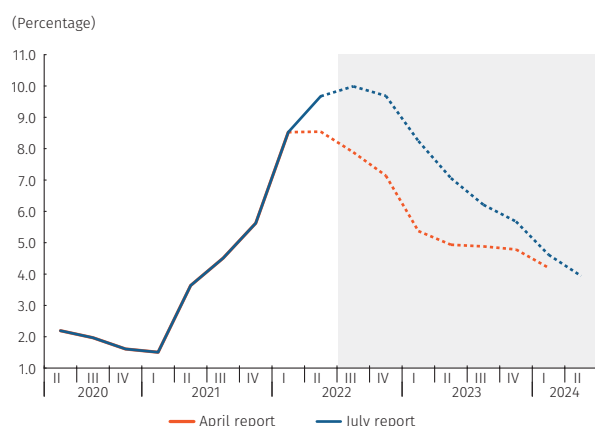
**The inflation forecast increased significantly due to stronger and more persistent internal and external pressures than those projected in the previous report. In this forecast, inflation would begin to decrease as of the end of this year, partly because of monetary policy decisions.** The new forecast takes into account higher and longer-lasting exogenous pressures than anticipated a quarter ago, a greater output gap and significant exchange rate pressures, especially for the remainder of the year. Likewise, it integrates an

21 The average for the second quarter of 2022 for five-year credit default swaps in Mexico rose by 35 bp, in Peru by 25 bp, in Brazil by 21 bp and in Chile by 18 bp. The average quarterly foreign exchange rates increased during this period in Brazil (5.7%), Mexico (2.3%) and Peru (1.5%), but decrease in Chile (4.6%),

22 According to the June 2022 survey of primary dealers formulated by the New York Federal Reserve Bank, within a six-month horizon, a 12% median probability of a U.S. recession and 25% probability of a global recession.

23 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 2.11  
Consumer Price Index (CPI)  
(annual change, end-of-period)



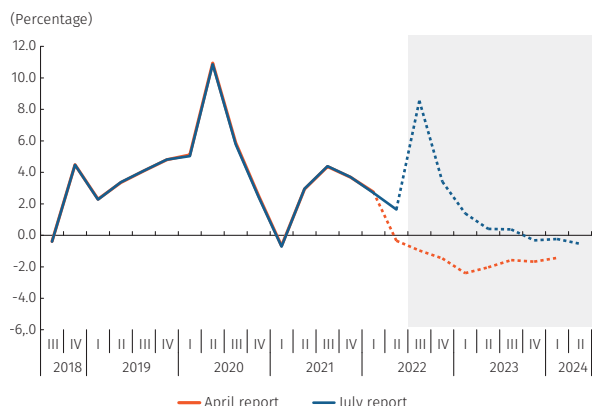
Source: DANE, calculations and projections by Banco de la República.

escalation in short- and medium-term inflation expectations and the indexation of salaries and prices at higher rates, considering the steeper levels of observed and expected inflation. The current forecast does not include new VAT-free days and includes greater adjustments to the internal price of fuels for the rest of the year and in 2023, in contrast with that foreseen in the April report. As mentioned throughout this report, the demand dynamics have been greater than expected with a positive output gap that would close by yearend 2023, generating greater upward pressures on prices than was previously foreseen. This pressure would dissipate as those factors propelling the heightening consumption growth lose strength and as the monetary policy adjustment would temper economic growth, bring about a closing of the output gap and anchor inflationary expectations to its target. All this, along with the lessening of internal and external shocks that have mainly affected food prices, lead the technical staff to foresee in this report a decrease in headline annual inflation as of the fourth quarter of the year, with greater impetus during 2023 and 2024. In this way, the central forecast scenario of this report considers headline inflation of 9.7%, 5.7% and 3.9% for yearend 2022, 2023 and the second quarter of 2024 (Graph 2.11). These estimates continue to include a high degree of uncertainty, especially given the high risks the external environment faces and the various fuel price adjustments that could occur, as well as the impact of the dismantling of the reliefs on indirect taxes that remain in force.

**The inflation projected for yearend 2022 and 2023 is very sensitive to any adjustment in domestic fuel prices.** Given the current and expected levels of international fuel prices and of the exchange rate, there is presently a significant gap between international prices and domestic prices in pesos, which has generated a considerable deficit in the Fuel Price Stabilization Fund (FEPC for its Spanish acronym). To close this gap, significant adjustments would be necessary for the domestic prices of motor fuel oil (ACPM for its Spanish acronym) and regular gasoline. In addition to the direct impact gasoline price adjustments have on the consumer price index (CPI), there is also perhaps a more significant indirect impact from the costs of some inputs, transportation, and commercialization, according to estimates prepared by the Bank's technical staff. Additionally, the course of the adjustments adopted may also have repercussions on other variables, such as the country's risk premium, the foreign exchange rate, inflation expectations and consumption, which makes estimating its total impact on inflation both complex and uncertain. In this report, a year-to-year adjustment of the CPI for fuels is anticipated at close to 15%, both for 2022 and 2023, which are higher figures than those foreseen in the previous report.

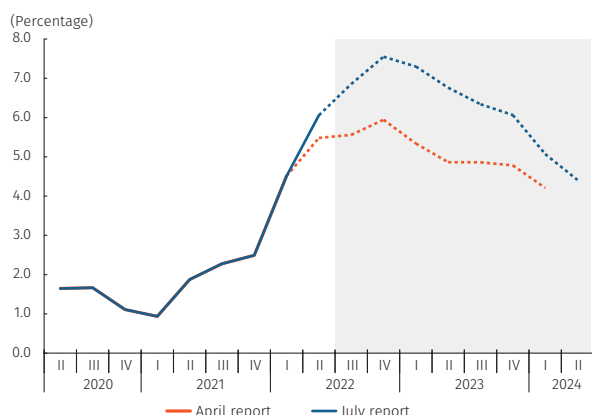
**Core inflation should continue to rise during the remainder of the year, but as of 2023, it would begin to show a downward**

**Graph 2.12**  
**Quarterly RER inflationary gap<sup>a/</sup>**  
**(annual change, period average)**



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.

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



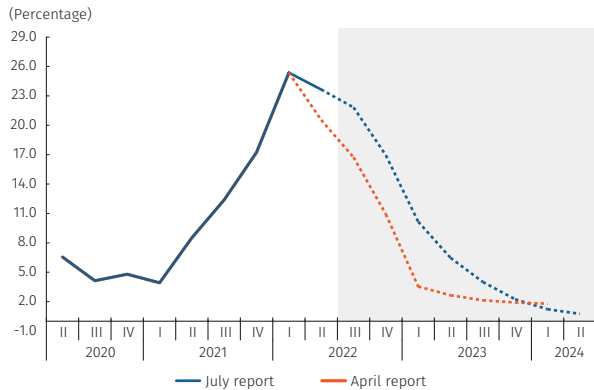
Source: DANE, calculations and projections by Banco de la República.

**trend attributed to a lessening of external pressures, and to monetary policy adjustments that would moderate demand and anchor target inflation expectations.** In this report, the forecast of the annual variation in the CPI excluding food and regulated items increased significantly for the previously mentioned reasons. The increase in the domestic price of fuels would have a significant indirect impact, especially on the CPI for goods, by way of the increase in transportation costs. Moreover, the central forecast now contemplates positive values for the real exchange rate (RER) inflationary gap during the next three quarters, which reflects upward pressures on prices, especially until the end of this year (Graph 2.12). Against this backdrop, core inflation is expected to peak at the end of 2022, closing the year at 7.5%. From that point forward, and aided by waning exogenous and foreign exchange rate pressures coupled with the effects of monetary policy, this indicator should begin a downward trajectory, finishing at 6.1% by yearend 2023 and 4.4% in mid-2024 (Graph 2.13).

**The decline in core inflation as of 2023 goes hand in hand with a lessening of price adjustments for goods and foods away from home (FAH).** The CPI trajectory for goods and services escalated, given the greater permanency of exogenous and foreign exchange pressures, which in the case of the CPI for services is mainly conveyed through FAH. This revision is also in line with a more dynamic demand that has enabled significant adjustments to various categories of the CPI, such as items associated with tourism. All these factors would continue to exert upward pressure on prices for several months and would begin to ease at the end of this year and, particularly, throughout 2023. The forecasts for the services sub-basket also reflect high levels of headline inflation in effect for longer, resulting in greater inertia of the CPI for services due to the importance indexation mechanisms and inflation expectations have thereon. For this reason, the year-on-year variation of the CPI for this sub-basket is expected to resume a downward trend only as of 2024. Goods, on the other hand, would adopt a downward trajectory as of 2023, once the significant exogenous and foreign exchange rate pressures subside. The forecasts for both sub-baskets would continue to reflect the reversal of the indirect tax reliefs. In the case of goods, this is a reinstatement of the VAT for those items covered under the VAT-free day in June and the decree ending the public health emergency issued in the same month. For both instances, their effect on the CPI should be seen throughout the third quarter of this year. In the case of services, the full VAT is expected to be restored for hotels, tourism, and air tickets, as well as the reinstatement of the consumption tax on FAH for all establishments as of the first quarter of 2023.

**Annual adjustments to food prices would continue to ameliorate in the second half of the year, with this trend accentuating in 2023 as exogenous pressures subside and**

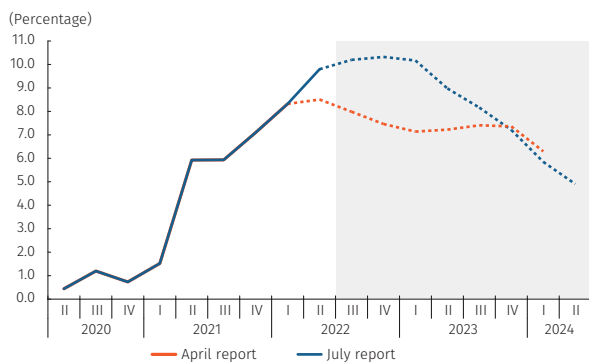
**Graph 2.14**  
CPI for foods  
(annual change, end-of-period)



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

**the internal supply of agricultural products stabilizes.** The greater and more persistent exogenous pressures, combined with higher fuel prices that drive up the costs of food production and commercialization, led to an upward revision of the CPI forecast for this sub-basket. Nevertheless, it is expected these exogenous pressures will begin to subside, and consequently, the annual adjustment of the CPI for foods, including processed food, would show a marked downward tendency towards the end of this year. This decline would also be sponsored by the recovery and stabilization of the domestic supply of perishable foods, thanks to favorable weather conditions affecting the bulk of agricultural products, and a return to normalcy of the farming cycle to its state before the disruptions caused by the strikes of May 2021. Accordingly, the annual variation of the CPI for food in the central forecast scenario of this report would close 2022 at 16.9% and 2023 at 2.2 % (Graph 2.14) and would remain at low levels in 2024.

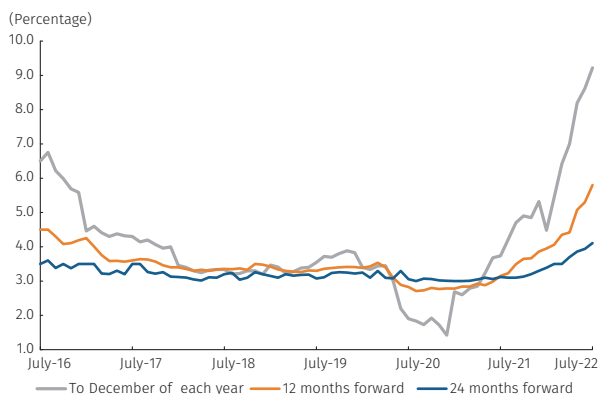
**Graph 2.15**  
CPI for regulated items  
(annual change, end-of-period)



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

**The CPI for regulated items would continue to register significant adjustments for the remainder of the year, with modest declines expected in 2023 due to upward pressures resulting from the possible increase in fuel prices.** In the forecast horizon, there are also upward pressures stemming from the high levels exhibited by the CPI, the producer price index (PPI), the exchange rate, and international prices for some raw materials and the triggering of indexation mechanisms that affect the rate formulas for public services and other regulated items, causing the annual variation of this sub-basket to remain high for several quarters. The high expected adjustments would also be the result of the transfer of costs associated with investments and replacement of losses of some public utilities must carry out, particularly in the case of electricity. Alongside these factors, higher domestic fuel prices support the upward revision in the projected trajectory of the year-on-year CPI variation for regulated items for 2022 and 2023 (Graph 2.15). Thus, the annual adjustment of this sub-basket would stand at 10.3% by yearend 2022, then cede as a result of a reduction in exogenous pressures and costs to 7.2% by December 2023. By mid-2024, this figure is expected to reach 4.9%.

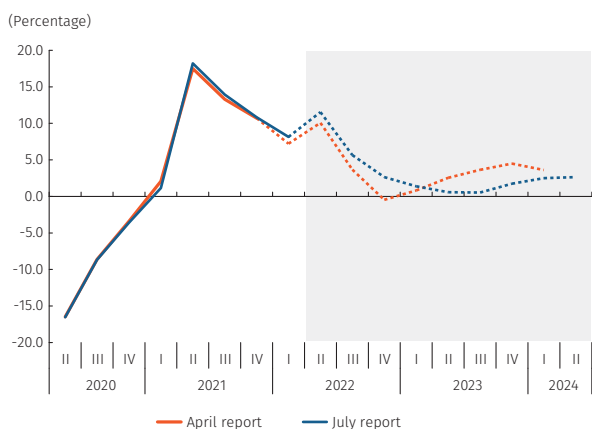
**Graph 2.16**  
Bank and stockbroker inflation forecast<sup>a/</sup>



a/ Median response to Banco de la República's monthly analyst expectations survey.  
Source: Banco de la República.

**The market's inflation expectations for yearend 2022 increased and continue above the target for all terms.** The expectations of economic analysts, obtained from the monthly survey conducted by Banco de la República between July 6 and 12 (Graph 2.16), suggest a median inflation expectation for 2022 of 9.2% (7.0% in the April survey) and of 7.6% for inflation expectations excluding food (5.6% in the April survey). By yearend 2023, according to the survey results, these values would drop to 5.2% and 5.1%, respectively (4.1% and 3.9%, respectively, in the April survey). Moreover, with information to July 22, the projected expectations based on public debt bonds (breakeven-inflation, EIB), adjusted by the inflationary

Graph 2.17  
Quarterly GDP <sup>a/</sup>  
(annual change)



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

and liquidity risk premiums,<sup>24</sup> show two-, three- and five-year inflation of 5.28%, 5.03% and 4.60%, respectively (5.08%, 4.83% and 4.45%, respectively, in the April report).

### 2.2.2 Economic activity

**The Colombian economy would have continued showing significant and dynamic growth in the second quarter of the year, exceeding the expectations of the previous report.**

Based on available data,<sup>25</sup> this report projects annual growth of 11.5% for the second quarter (seasonally adjusted and corrected for calendar effects), a figure that is higher than that forecast in the April report (10.1%) and also surpasses the growth seen in the first quarter. The latter is largely due to a very low year-to-year comparison base versus 2021<sup>26</sup>(Graph 2.17). However, the forecast implies an increase from the high level seen in the previous quarter of 5.2% (annualized quarterly variation). Consumption and, to a lesser extent, non-traditional exports would have continued to be the main sources of economic expansion in the later months. On the supply side, art, entertainment and recreation activities, commerce, repairs, transport and accommodation and the manufacturing industry would be the most dynamic sectors, while construction and mining would lag, although still showing year-to-year growths.

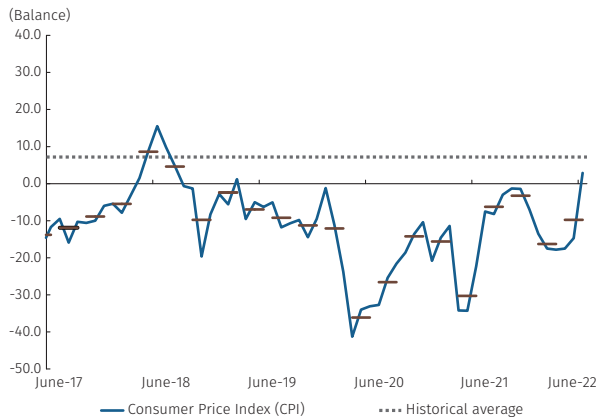
**Between April and June, consumption behavior continued to play an important role, greatly surpassing pre-pandemic levels, specifically because of the boost in household spending.** After growing more than expected in the first quarter, the indicators available for the second quarter suggest that private consumption would have increased once more at notable annual and quarterly rates. Indicators pointing upwards include the Economic Monitoring Indicator (ISE) for the tertiary sectors, retail sales, transaction figures of some commercial banks, consumer credit loans, imports of durable consumer goods and vehicle registrations. The consumption of services, which enjoys the largest share in household spending, would continue to exhibit dynamism

24 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.

25 Box 1 of this report provides an econometric exercise that summarizes the information derived from various indicators of economic activity.

26 The second quarter of 2021 was affected by a Covid-19 peak in April and by a national strike and road blockades that took place in May.

**Graph 2.18**  
Consumer confidence index and quarterly average

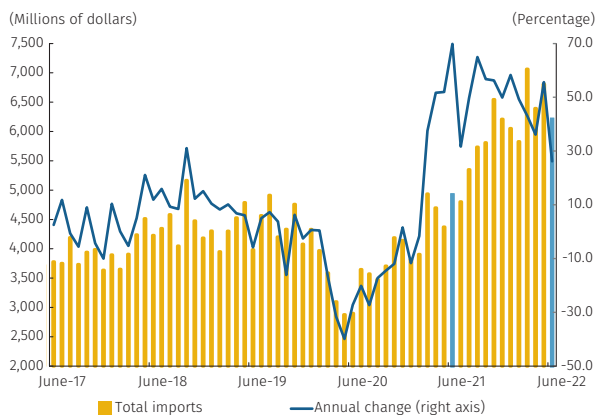


Source: Fedesarrollo.

and, in this period, the VAT-free day in June would have favored durable and semi-durable consumption, which would have grown at annual rates of over 20%. The favorable performance of household consumption continues to be sustained by employment recovery, the gradual improvement of consumer confidence (Graph 2.18), and the wide availability of credit and transfers from the Central National Government (CNG) to households, among other factors. Additionally, CNG consumption would have also grown in the second quarter versus the first, driven mostly by general and personnel expenses. All the above implies that the expected moderation in total consumption, generated by reduced excess savings and a tighter monetary policy, would not have materialized in these months as was expected, and would be put off until the second half of the year, as will be discussed later.

**In the second quarter, investment would have continued to show modest growth, hand in hand with a very slow recovery of the construction sector.** Imports of capital goods to June (based on advanced information from the DIAN) suggest that investment in machinery and equipment would have recorded a quarterly drop, largely because the historically high level of spending on transportation equipment in the first quarter was not repeated in the second. However, the dynamism in the manufacturing sector would have continued to guarantee relatively high investment levels for this segment. Alternatively, figures for sales and starts of residential construction suggest that housing investment has continued to slowly recover, especially driven by the social interest housing segment (according to the building census figures). Likewise, an increase in investment in other buildings and structures is also expected, although the highest growth in this segment would be seen in the second semester by way of the execution of investment projects in civil works construction by local governments and by the mining and energy sector. Despite the above, construction investment would have remained below the levels seen before the shock brought on by the pandemic. Gross fixed capital formation would have remained stable, at a level close to that observed in the first quarter, continuing below pre-pandemic values.

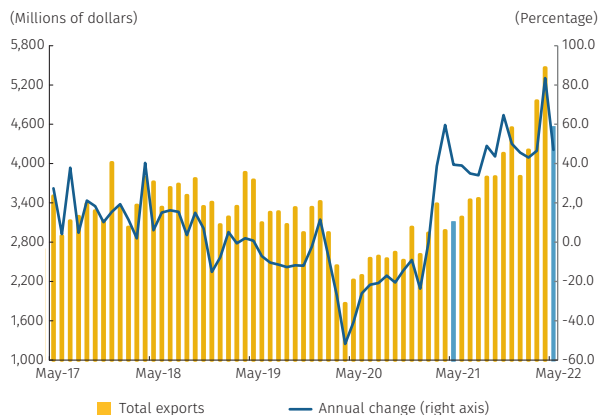
**Graph 2.19**  
Total goods imports (CIF)  
(monthly)



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

**Investment levels in machinery and equipment decrease would be consistent with lower import values in real pesos, which should lead to a small trade deficit reduction in the second quarter.** Imports would have registered lower levels than those of the first quarter, especially owing to a decline in capital goods purchases, as suggested by the interim figures to June (Graph 2.19). Moreover, exports would have remained at levels very close to those seen at the start of the year, with heterogeneous behavior throughout its various segments. DANE figures to May (Graph 2.20) identify a significant growth in international sales of coal and ferronickel, with a more moderate behavior for oil and a significant drop in coffee sales. The most dynamic export sector would continue to be that of non-traditional goods and services. The former

**Graph 2.20**  
Total goods exports (FOB)  
(monthly)



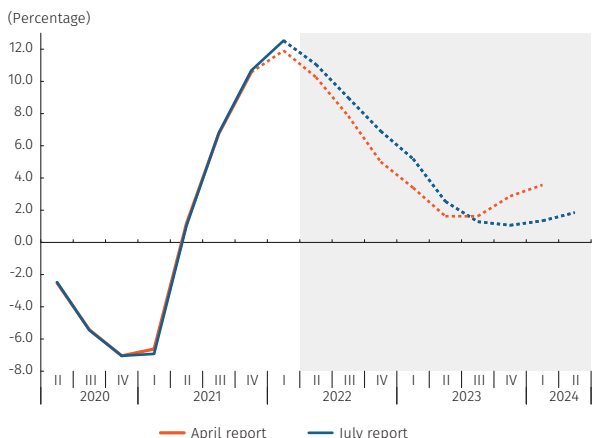
Source: DANE, calculations and projections by Banco de la República.

would have been favored primarily by the recovery of the principal commercial partners and, to a lesser extent, by greater commercial activity with Venezuela. The latter would continue to be driven by foreign tourism. Considering the abovementioned, the trade deficit in real pesos would have shown a slight reduction in the second quarter, down from its very high level in the first. Herewith, net foreign demand would have detracted from annual GDP growth, although to a lesser extent than that observed in the first quarter.

**The growth forecast for the full year was revised upwards given the high GDP growth values that would have been reached in the second quarter, although a slowdown is anticipated in the second half of 2022.**

In addition to a more restrictive monetary policy, the slowdown in growth towards the second semester would take place in a less favorable international environment, characterized by tighter exogenous financial conditions and lower growth anticipated for Colombia’s trade partners. This forecast assumes that consumption increases, both private and public, will abate, which would be only partially offset by improved investment levels. Although the recovery in employment and the significant transfers and subsidies granted by the government continue to favor activity in household consumption, other factors such as the depletion of surplus savings and the inflation increase that affects purchasing power and consumer confidence, tend to limit its growth. This will also be affected by increases in the interest rate for consumer loans, resulting, in part, from the increases in the monetary policy interest rate that began last September. Regarding public consumption, the technical staff considers for this report there would be a significant falloff this year in the fiscal deficit, which is consistent with the Medium-Term Fiscal Framework (MTFF) projections and which would imply curbed growth in public consumption versus that observed in 2021. In contrast, in investment, the trend towards a gradual recovery is expected to continue concurrently with housing construction, given the government’s advances in subsidy programs for social interest housing and the high housing sales volume registered in 2021. Similar behavior is expected for other buildings and structures (including civil works), thanks to the execution of projects by the National Government and, especially, by local and regional administrations, many of which already have financing. However, investment levels would lag behind pre-pandemic levels. On the international front, exports would show significant annual growth, largely due to a low comparison baseline versus 2021 and a greater real depreciation, which would mitigate the possible effect of the expected slowdown of the main trade partners. Finally, imports would remain at high levels, displaying considerable growth rates consistent with the forecasts for domestic demand. All of this leads to a growth forecast of 6.9% for the full year (Graph 2.21), which is higher than that anticipated in the April report (5.0%).

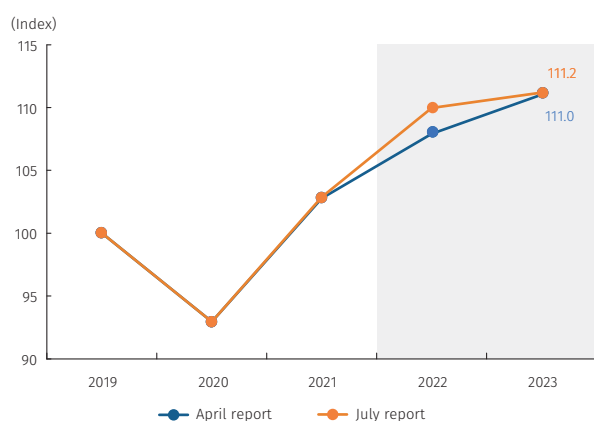
**Graph 2.21**  
GDP, four-quarter cumulative<sup>a/</sup>  
(annual change)



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



Graph 2.22  
GDP, yearly levels  
(index, 2019=100)



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

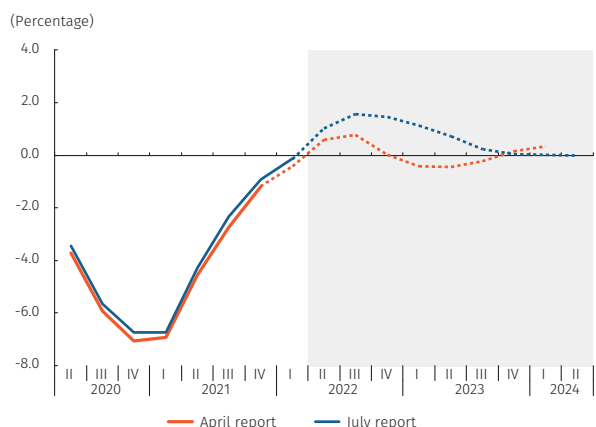
**Modest economic growth is expected for 2023, strongly correlated with an expected adjustment in consumption levels and a slowdown in the world economy.**

The monetary policy adjustment has a delayed effect on spending decisions, and as such economic growth would tend to be lower than that observed to the first semester of 2022. Additionally, internationally, less expansive financial conditions are also expected for the remainder of 2022 and 2023. This, alongside the lower growth of Colombia's trade partners and a small decline in the terms of trade, should limit the growth of the Colombian economy. Given the expected GDP values for this year, in 2023 the pace of the economy's expansion rate would temper off, which would allow it to maintain levels that are more compatible with the potential GDP and the convergence of inflation to the target. In 2023, growth would be driven mainly by investment, especially in the construction of civil works carried out by local and regional governments. Despite the expected recovery of investment levels, during the forecast horizon, these would remain below those observed before the pandemic. For its part, there would be a downward adjustment of total consumption from the high average levels estimated for 2022. Given the abovementioned, the Bank's technical staff projects a 1.1% economic growth in 2023 versus the 2.9% forecast in the April report, a revision that is partly due to a larger comparative base in 2022 (Graph 2.22). It is important to note significant uncertainty regarding fundamental domestic and external factors upon which this forecast is built, detailed in Section 2.3 of this report.

**Considering the steady employment growth and the economic activity forecasts contemplated in this report, it is estimated that the national unemployment rate will continue to decline in 2022.**

The information provided by the DANE's Integrated Household Survey (GEIH) and administrative records shows a dynamic labor market with steady employment growth at levels similar to those observed in February 2020. To a great extent, this behavior has been driven by job generation in urban areas and the segments with the greatest income stability: salaried and formal employees. Other demand indicators, such as job vacancy rates and staffing expectations, are at record high levels and confirm the positive performance of the labor market. Furthermore, labor force participation rates continue to grow at a slower pace when compared to employment, which has led to a fall in the unemployment rate, principally in urban areas (see Chapter 3). Based on this dynamic and the macroeconomic scenario foreseen in this report, the technical staff estimates that the national unemployment rate would continue to drop slowly until it reaches 10.2% by yearend 2022. Hence, the yearly average would be between 10.2% and 11.5%, with a most likely value of 10.8%. In urban areas, it is estimated that the average unemployment rate in 2022 would lie between 10.4% and 11.7%, with an intermediate

Graph 2.23  
Output gap<sup>a/</sup>  
(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: DANE, calculations and projections by Banco de la República.

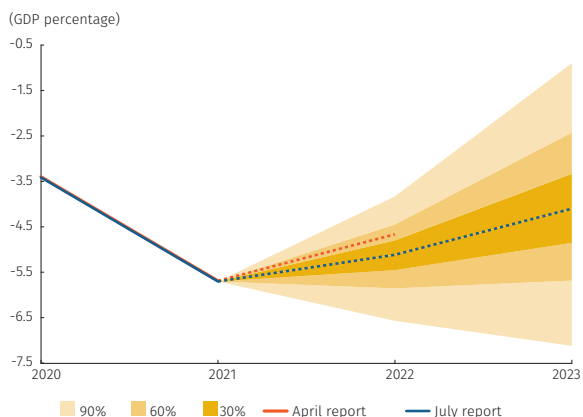
scenario of 11.1%.<sup>27</sup> The estimates also suggest a wider urban unemployment gap than that estimated in the previous report (see the July 2022 Labor Market report), which would imply a tighter labor market that could generate inflationary pressures.

**Recent estimates indicate the output gap is currently in positive territory and, consequently, the economy is operating above its productive capacity.** This gap is expected to close towards the end of 2023 and remain around zero for the remainder of the forecast horizon. The most recent data on economic activity continues to show significant dynamism, mostly driven by private consumption, as well as a labor market that continues to demonstrate steady employment growth in urban areas, with a consequent decrease in the unemployment rate. Prices up to the second quarter of the year continue to show a significant upward trend in headline and core inflation as a result of various internal and external shocks and a dynamic demand (see Chapter 3). Overall, this report estimates that the annual output gap for 2022 would stand at 1.5% (versus 0.0% estimated in the April report), in line with projected GDP growth (6.9 %) (Graph 2.23) and potential output growth of 4.4% in 2022. By yearend 2023, it is estimated that the annual output gap would fall towards values close to zero, with an output potential that would grow by 2.5 %. It should be noted that there is high uncertainty regarding these estimates due to the internal and external risks mentioned in section 2.3 of this report.

### 2.2.3 Balance of payments

**The current account deficit of 5.1% of GDP is projected for 2022, a figure lower than the 5.7% observed a year ago (Graph 2.24).**<sup>28</sup> Higher prices of Colombia's main product exports would contribute to this result, which would boost the value of the country's foreign sales despite the modest recovery expected in the production of several of these goods.<sup>29</sup> In addition, non-traditional exports would show a favorable dynamic, net foreign income from international tourism would recover,

Graph 2.24  
Annual current account<sup>a/, b/</sup>  
(four-quarter cumulative)



a/ The graph displays the probability distribution and its most likely trajectory 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 July report  
Source: Banco de la República.

- 27 On July 29, at the close of this report, the DANE published the results of the GEIH with figures to June. From these results, it is noteworthy that, for that month, the seasonally adjusted unemployment rate was 11.7% both in the national aggregate and for the thirteen main cities.
- 28 In the second quarter of 2022, the current account deficit would have reached 5.8% of quarterly GDP. The net outflows by factor income would explain a high share of the imbalance and would have rebounded mainly as a result of the higher profits of oil and coal exporting companies. The trade deficit for goods and services would show a year-on-year decrease explained, to a large extent, by the high prices of exports, despite the positive import dynamics. Workers' remittances would reach an all-time high, which would partially decrease the pressure to widen the deficit.
- 29 High international prices of mining and energy products, coffee, and industrial products, among others, would boost exports, despite the fact that most exported product volumes would only grow at modest rates, remaining below pre-pandemic levels.

and high current transfers would be registered.<sup>30</sup> However, the external deficit is expected to remain relatively elevated due to higher imports of goods and services, reflecting a positive dynamic in domestic demand. Price increases would contribute to the nominal growth of imports, largely in fuels and inputs for industry and agriculture. In addition, an increase in the remission of earnings of businesses with foreign capital,<sup>31</sup> the increase in freight payments due to high international freight transport rates, and the rise in the interest rate of the external debt would limit the reduction of the external deficit. A decrease in 2022 of the current deficit would be compatible with a downward fiscal deficit path. By 2023, the current account deficit is projected to continue to decline, to 4.1% of GDP. Among the reasons for the annual correction would be a moderation in total consumption from the high levels reached in 2022, which would contribute to both reducing imports, as well as to lower the profits of the companies that operate in the local market. This would add to the normalization of global freight transport rates and the reductions in global input prices, among others. On the contrary, other aspects such as lower prices of the main exported products and their low production volumes, the slowdown in external demand, higher interest on the external debt, and the lessening of workers' remittances, would limit an annual decrease in the external imbalance. Finally, it must be highlighted that high uncertainty continues for this year's projections due to the risks associated with changes in global and domestic financial and economic conditions.

**During 2022 and 2023, the country would retain access to external financing, although at higher costs and facing high volatility in global capital markets.** During these years, foreign direct investment (FDI) would finance a large part of the country's current deficit. However, these flows would be less dynamic in 2023, consistent with the lower economic growth and lower international prices for commodities Colombia exports.<sup>32</sup> Besides, the public sector would continue to contribute to the external financing through the acquisition of new liabilities, although at a lower amount than that of 2020 and 2021, in line with the expected decrease in the fiscal deficit. This forecast continues to reflect high uncertainty, especially surrounding the relevant external financial conditions the country would face.

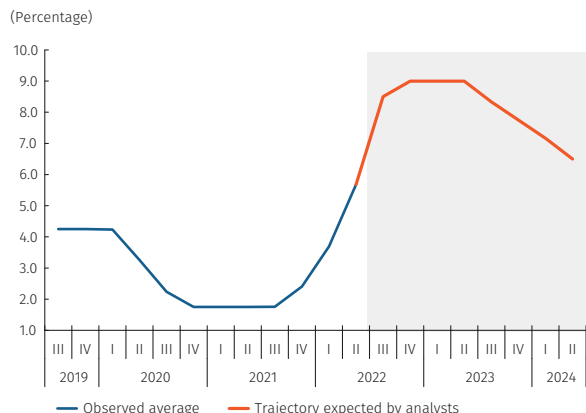
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30 Stemming firstly from worker remittances, with income from insurance payments from abroad ranking second.

31 The increase of earnings of businesses with foreign capital would respond to high oil and coal prices.

32 Regarding capital flows other than direct investment by the private sector in 2022, the constitution of net foreign assets is expected to diminish with respect to the previous year as the country's investments abroad would be partially offset by capital inflows associated with indebtedness.

**Graph 2.25**  
 Monetary policy interest rate: average observed quarterly and rate expected by analysts<sup>a/</sup>



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 July 2022.  
 Source: Banco de la República.

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

**The median analyst expectation for yearend policy rates is 9.0% (Graph 2.25).**<sup>33</sup> The median response to Banco de la República's monthly survey of analyst expectations carried out in July places the intervention interest rate at 9.0% for the fourth quarter of 2022. For the last quarter of 2023, analysts project an average rate of 7.8% and 6.5% for the second quarter of 2024. In the forecast horizon, the tighter-than-expected external financial conditions, persistent macroeconomic imbalances and the high country's risk premium suggest that the Colombian economy's neutral interest rate would be higher than its April estimate. Additionally, pressures from a higher exchange rate and a more positive output gap are compatible with increases in the monetary policy interest rate in the forecast horizon. Thus, 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 July 2022 survey. It must be noted that a high uncertainty level regarding global financial conditions, geopolitical tensions, raw material prices, China's response to the pandemic, the evolution of bottlenecks in global value and supply chains, domestic price formation, and developments in local economic activity over the forecast horizon. This information should be considered carefully as new data becomes available.

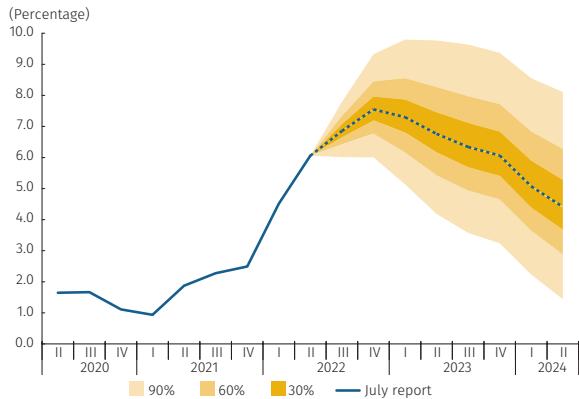
### 2.3 Balance of macroeconomic risks

**The risk associated with the course of external financial conditions is a significant source of uncertainty for the macroeconomic scenario.**<sup>34</sup> The main external risks considered in the policy horizon include high uncertainty regarding inflation dynamics in the United States and external financial conditions (specifically, the evolution of the Fed's interest rate and the risk premium); a possible weakening of global economic activity during 2023, uncertainty about the potential consequences a resurgence of the pandemic in China and its containment measures would continue having on international trade. It also contemplates the uncertainty surrounding the impact of Russia's invasion of Ukraine, and the cost pressures created by disruptions in global supply chains. Part of these risks have materialized and have been incorporated into the central scenario. Consequently, the

33 These projections are calculated as the average of the rate that would be in force in each quarter according to the median of the monthly responses of the survey of economic analysts' expectations carried out by Banco de la República in July 2022.

34 This section considers the risk factors for the macroeconomic scenario proposed by the technical staff and included in predictive densities (PD) exercises. The technical details on the construction of the balance of risks applying predictive densities methodology exercises can be found in the document "Characterizing and Communicating the Balance of Risks of Macroeconomic Forecasts: A Predictive Densities Approach for Colombia" (Mendez-Vizcaino et al., 2021) and in Box 1 of the July 2021 Monetary Policy report.

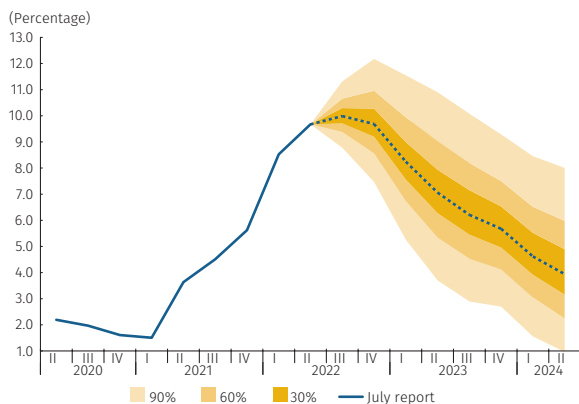
**Graph 2.26**  
CPI excluding food and regulated items, predictive density<sup>a/,b/</sup>  
(annual change, end-of-period)



	4Q 2022	4Q 2023	2Q 2024
<b>Mode</b>	7.55	6.06	4.41
<b>&lt; Mode</b>	46.0%	45.2%	44.8%
<b>Intervals</b>			
<2	0.0%	0.9%	8.8%
2--4	0.0%	9.5%	27.6%
>4	99.9%	89.5%	63.4%

a/ The graph displays the probability distribution and its most likely trajectory 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 July report.  
Source: DANE, calculations and projections by Banco de la República.

**Graph 2.27**  
Consumer price index, predictive density<sup>a/,b/</sup>  
(annual change, end-of-period)



	4Q 2022	4Q 2023	2Q 2024
<b>Mode</b>	9.69	5.67	3.94
<b>&lt; Mode</b>	46.7%	44.8%	44.7%
<b>Intervals</b>			
<2	0.0%	2.2%	15.2%
2--4	0.0%	14.4%	30.5%
>4	99.9%	83.3%	54.1%

a/ The graph displays the probability distribution and its most likely trajectory 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 July report.  
Source: DANE; calculations and projections by Banco de la República.

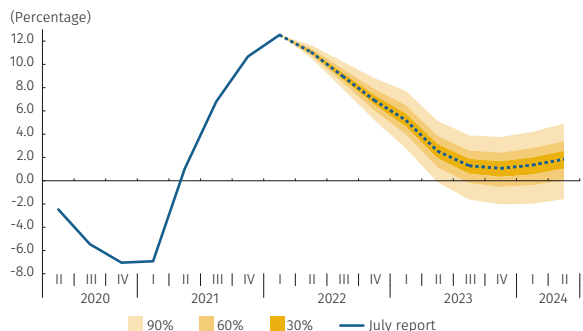
balance of risks in the macroeconomic forecast is more balanced than the assessment published in April's report.

**The balance of macroeconomic risks also captures a high level of uncertainty associated with local risk factors.** The possibility of higher costs of external financing than those estimated in the central scenario stands out. The foregoing provided that the high uncertainty in the local economic outlook would be coupled with external risks, in a scenario where fiscal and external deficits persist. The materialization of said risk would imply stronger exchange rate pressures on inflation, higher interest rates and lower levels of economic activity. Additionally, the risk of a slower convergence of inflation towards the target is considered, given the possibility of indexation of prices and wages to higher inflation levels, the likelihood that supply shocks (that have mainly affected the food and goods baskets) do not dissipate as quickly as expected, and/or that the strong dynamics of domestic demand last longer.

**The predictive densities (PD) exercise includes higher levels of uncertainty and an upward bias in projected core inflation, with a high probability that it would remain above the target in the forecast horizon.** The possibility of less favorable external financial conditions would imply greater exchange pressures on prices and an upward bias in inflation excluding food and regulated items (Graph 2.26), particularly in the basket of goods. Another upward influence for inflation excluding food and regulated items would relate to a larger effect of indexation on prices, with substantial impacts on items such as rent and foods away from home (FAH), particularly in a scenario where the output gap is positive. Substantial sources of risk continue in place for the food basket but are relatively neutral on balance since the materialization of risks associated with global supply chain disruptions has been incorporated into the central scenario. The regulated items basket takes account of risks associated with fuel price adjustments, oil price forecasts, and exchange rate pressures. Furthermore, the risk of greater increases in utilities remains, given the indexation dynamic that is particular to this basket. As such, the projected path of headline inflation in the forecast horizon shows an upward bias (Graph 2.27), although to a lesser extent than that in the previous report. Nonetheless, the probability that inflation will remain above the inflation target is high.

**The balance of risks for GDP growth exhibits downward biases for 2023.** GDP growth suggests a balance of risks for 2022 that is slightly biased. Nevertheless, several risks persist in the forecast horizon that generate downward biases during 2023 and the first semester of 2024 regarding both growth and the output gap (Graphs 2.28 and 2.29). Among the factors that produce these downward biases are those associated with changes in international financial conditions, higher country-risk premiums, the possibility of a slowdown in global

**Graph 2.28**  
GDP, four-quarter cumulative, predictive density<sup>a/, b/, c/</sup>  
(annual change)



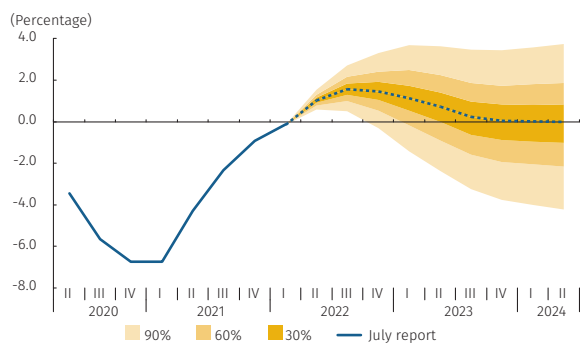
	4Q 2022	4Q 2023	2Q 2024
<b>Mode</b>	6.91	1.06	1.85
<b>&lt; Mode</b>	48.3%	56.1%	54.3%
<b>Intervals</b>			
<b>&lt;2</b>	0.0%	74.6%	57.2%
<b>2--5</b>	3.2%	24.2%	38.1%
<b>&gt;5</b>	96.9%	1.0%	4.5%

a/ The graph displays the probability distribution and its most likely trajectory 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/ Seasonally adjusted and corrected for calendar effects.  
c/ The probability distribution is derived from the forecasting exercise of the July report.  
Source: DANE, calculations and projections by Banco de la República.

economic activity, geopolitical tensions, and bottlenecks that continue to affect global production and distribution chains. At the domestic level, the risks of a greater-than-expected slowdown in consumption and investment, as well as uncertainty about fiscal policy, imply a wider uncertainty regarding economic activity forecast and a negative bias for 2023.

**In summary, the balance of macroeconomic risks is characterized by wide forecast intervals, an upward inflation bias and a downward GDP growth bias during 2023.** Considering the risk factors and biases that have been discussed, there is a 90% probability that headline inflation would lie between 7.5% and 12.2% by yearend 2022, and between 2.7% and 9.3% by yearend 2023. Core inflation, with the same degree of certainty, would be between 6.0% and 9.3% by yearend 2022, and between 3.2% and 9.4% by December 2023. Regarding economic activity, estimated GDP growth would be between 5.2% and 8.8% for 2022 and between -2.0% and 3.8% for 2023.

**Graph 2.29**  
Output gap, predictive density<sup>a/, b/, c/</sup>  
(four-quarter cumulative)

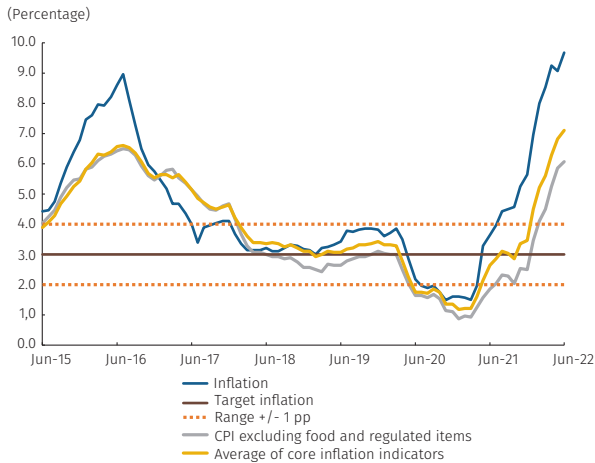


	4Q 2022	4Q 2023	2Q 2024
<b>Mode</b>	146	0.04	-0.01
<b>&lt; Mode</b>	50.3%	54.8%	56.1%
<b>Intervals</b>			
<b>&lt;-1</b>	0.7%	35.6%	38.8%
<b>-1--0</b>	8.1%	18.0%	16.9%
<b>0--1</b>	24.6%	17.2%	15.4%
<b>&gt;1</b>	66.2%	28.4%	28.1%

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; in 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.  
b/ The graph displays the probability distribution and its most likely trajectory 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.  
c/ The probability distribution is derived from the forecasting exercise of the July 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, calculations by Banco de la República.

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



Sources: DANE, calculations by Banco de la República.

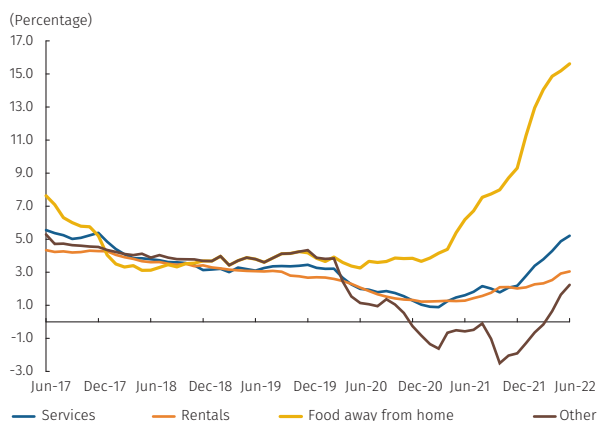
#### 3.1 Inflation and price behavior

**Annual consumer inflation continued to rise during the second quarter, as a result of upward external and domestic pressures.** Annual consumer inflation in June (9.67%) was higher than that of March (8.53%) as well as that observed in December 2021 (5.62%) (Graph 3.1). The figure for June exceeded both the market and the technical staff's expectations published in the April Monetary Policy Report. The discrepancy in the forecast was primarily evident in the price of food and regulated items, whose annual price variations were much higher than the projections stated in the previous Report. Core inflation (without food or regulated items) also registered increases during the first semester of 2022, from 2.49% in December 2021 to 4.51% in March and 6.06% in June.<sup>35</sup> This significant variation in annual prices has been driven by a multiplicity of simultaneous external and internal shocks. Exogenous factors identified include the impacts on the food supply, procurement of agricultural inputs and high fuel prices resulting from Russia's invasion of Ukraine. The continued implementation of China's zero-tolerance policy regarding Covid-19 has recently accentuated bottlenecks in global supply chains, as well as in the transport of raw materials and other goods. In addition, adverse weather events and export cutbacks or bans by some countries have contributed to reducing the global supply of basic goods and boosting their prices. On the domestic front, inflationary pressures have occurred, derived from a vigorous demand dynamic that would have operated above the productive capacity, the higher indexation of some services and regulated items due to higher consumer and producer inflation, and a decrease in the local supply of some foods caused by adverse production cycles and the increase in exports, particularly beef and fruit.

**The annual variation in the CPI for goods continued to rise during the second quarter, driven by dynamic domestic demand, increasing production costs and the accumulated exchange rate depreciation.** Annual change in the CPI for goods increased between December (3.3%), March (6.4%) and June (8.3%) (Graph 3.2), as a result of persistent cost pressures resulting from the aforementioned external factors. Additionally, the country has seen an evident recovery in the consumption of goods, particularly health and personal hygiene products, as well as growing demand for means of transportation and associated supplies and spare parts. The recent depreciation of the peso against the dollar also needs to be considered. In turn, the second VAT-free day (June 17) did

35 As part of this report, an analysis was conducted of the common factors behind inflation, which is summarized in Box 2.

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



Sources: DANE, calculations by Banco de la República.

not exert significant downward pressure on the CPI for goods as, in its price collection exercise for June, DANE recovered the indirect tax for many goods resulting from the first yearly VAT-free day (March 11).<sup>36</sup>

### Upward pressures on the services CPI continued in the second quarter and affected a significant number of items.

Despite the foregoing, at the end of the first semester, this segment registered the lowest annual price increase (5.21%) of all baskets comprising the CPI. Nevertheless, figures did surpass those for March 2022 (3.8%) and December 2021 (2.2%) (Graph 3.2). Food away from home (FAH) drove the increase in inflation for services during the second quarter, with an annual variation reaching a record 15.6% in June. This behavior can be explained by higher food prices, cost increases resulting from the rise in the minimum wage, significant adjustments to public service tariffs resulting from the partial reversal of indirect tax reliefs on segment-related services<sup>37</sup> at the beginning of the year, and a dynamic demand, among others. On the other hand, rentals, whose annual price adjustment in June (3.1%) exceeded the figure for March (2.3%), crept close to the inflation target (Graph 3.3). According to some real estate sector analysts, upward risks continue in this sector given that discounts granted by owners in the past are still in the process of reinstatement, and the renewal of new contracts that could be negotiated to include price hikes, thus reflecting the higher inflation observed. Other items, such as vehicle services and oil changes and purchases, air transport and hotel accommodation, recorded annual increases of over 10%. In turn, those services subject to competition (mobile telephone services) or those with drops in demand (higher education) registered negative variations over the last twelve months.

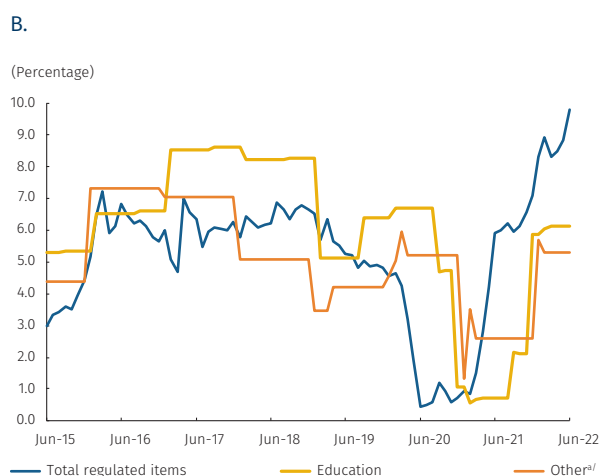
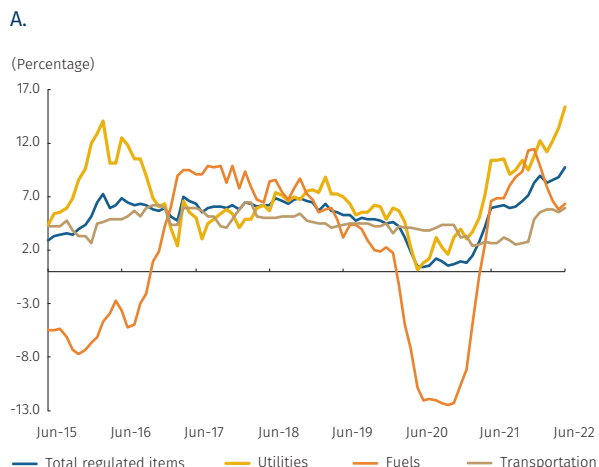
**The CPI for regulated items has been driven upwards by public services, as a result of the effect of high CPI and PPI indexation on prices.** As of June of this year, annual price variations in the regulated segment have been reporting an upward trend. A change of 7.1% for December 2021, and 8.3% for March and 9.8% for June of this year were registered. These dynamics can be explained primarily by the CPI for public services, whose annual adjustment rebounded significantly between March (11.2%) and June (15.3%), reaching an annual increase not seen since the beginning of 2016. (Graph 3.4, panel A). As of June, energy (19.6%) has been the primary

36 Due to DANE's seasonal collection pattern, a high percentage of the VAT recovered for the goods included in the first VAT-free day of the year (March 11) was collected in June, consequently the downward effect on the CPI basket of the most recent day (June 17) was partially diluted.

37 Consumption tax on food services was reestablished and partially verified in January 2022, in accordance with the provisions set forth in the Social Investment Law, which contemplates the recovery of indirect taxes for restaurants under the common tax regime, while those under the simple regime will do so as of January 2023. See paragraph 5 of Article 57 of Law 2155 of 14 September 2021 of the Congress of the Republic.

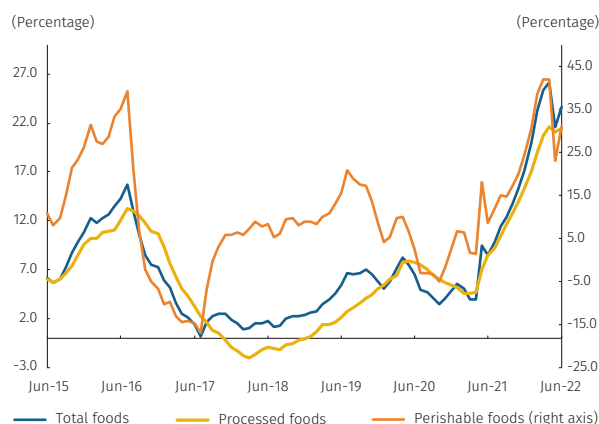


**Graph 3.4**  
CPI for regulated items and its components  
(annual change)



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

**Graph 3.5**  
CPI for foods and its components  
(annual change)



Source: DANE, calculations by Banco de la República.

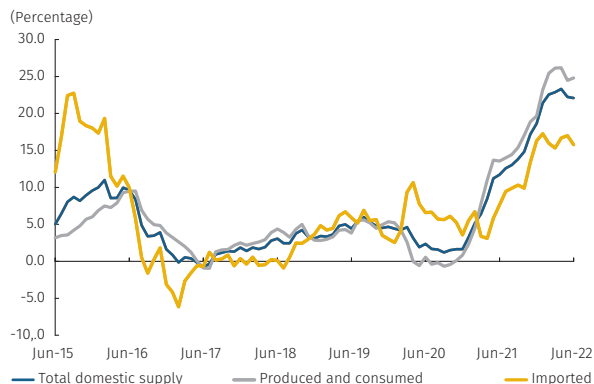
driver behind the annual changes in CPI for utilities. Both energy and water services have seen increases in prices due to the high indexation associated with the CPI (water) and the PPI (energy). In the case of energy, the increases in prices have also been a result of changes in the generation matrix, with the country as a whole moving towards greener alternatives (wind and solar) and investments allocated to the improvement of services and coverage (especially in cities located on the Atlantic Coast), among others. In turn, residential gas service prices have been driven by high international fuel prices and the cumulative depreciation of the peso against the US dollar. In contrast, the annual adjustment of domestic fuel prices has seen a fall between December (11.3%) and June (6.4%), favored by zero adjustments to domestic prices in recent months, thus continuing the widening of the gap with respect to international gasoline prices.<sup>38</sup> The remaining regulated items (transportation, education, and others) remained stable or did not show significant changes in the second quarter of this year (Graph 3.4, panel B).

**The annual change in the CPI for foods remained stable yet high during the second quarter, after the strong acceleration seen in previous quarters.** This CPI group registered a decrease in June 2022 (23.6%) over that of March (25.4%), although it remains above the figures reported for December 2021 (17.2%) (Graph 3.5). This downward trend is associated with an improved supply of perishable foods and, consequently, with a slower annual growth rate of prices between March (41.9%) and June (31.2%). In turn, processed foods continued to record high year-to-year levels in June (21.5%), as a result of the prevalence of high international food prices which, despite recent downward corrections, remain at historically high levels. Global upward pressures also continue to negatively affect the market. Some of these factors include the disruption of production chains, transportation costs that remain high, limitations in the supply of imported food to local markets as a result of the temporary suspension of exports by producing countries and problems in acquiring agricultural raw materials and supplies. In addition to the above, the current depreciation of the peso against the dollar is driving up prices of tradable food in the CPI, causing a decrease in the supply of meat, a good that has also been affected by an increase in exports.

**Annual producer inflation stopped rising during the second quarter, slowing down the upward momentum experienced since the beginning of last year.** However, the annual variation

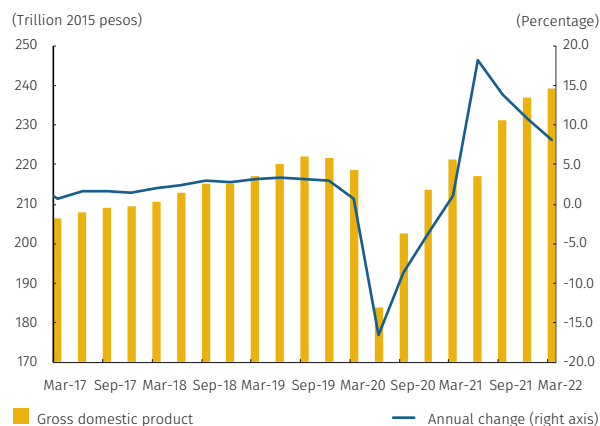
38 So far this year there has been only one increase in the domestic price of gasoline (January), compared to several adjustments made in the first half of last year. This explains the drop in annual variations in domestic fuel prices.

**Graph 3.6**  
PPI by origin  
(annual change)



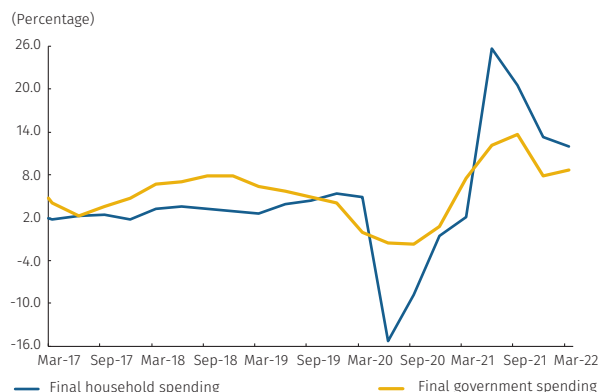
Source: DANE, calculations by Banco de la República.

**Graph 3.7**  
Quarterly gross domestic product<sup>a/</sup>  
(level and annual change)



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

**Graph 3.8**  
Final household and general government spending<sup>a/</sup>  
(annual change)



a/ Seasonally adjusted and corrected for calendar effects  
Source: DANE; calculations by Banco de la República.

of the PPI for domestic supply in June (22.1%)<sup>39</sup> remained at a historically high level, a situation that had not been seen since the end of 1991. It also did not record any significant change versus the data reported for March (22.9%) (Graph 3.6). The relative stability in annual producer inflation recorded in the last three months may be explained by a minimal rise in the import component between March (15.3%) and June (15.8%) and by a slight drop in the local segment (from 26.1% in March to 24.8% in June). It is also worth noting that the import PPI has been driven by the accumulated depreciation of the peso and disruptions to international production and logistic operations this year. In contrast to the above, the international prices of basic goods (metals and some foods) have seen a contraction during the last few weeks, which has created relative stability in the annual growth rate of the imported segment of the PPI during the second quarter. In turn, the contraction in the variation of the domestic PPI may be explained by the drop in the annual change in the agriculture and mining PPI, which recorded lower variations in June (41.1% and 52.4%, respectively) than those observed in March (49.4% and 58.0%).

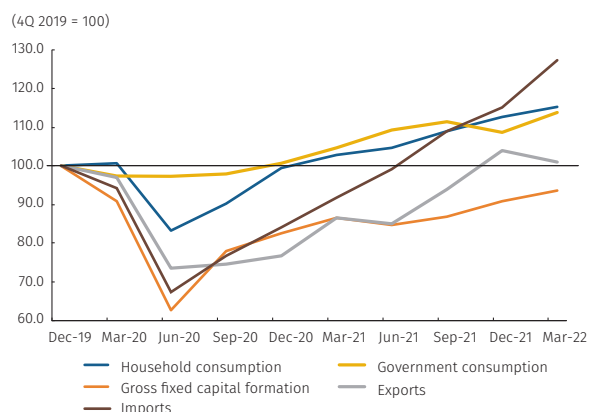
### 3.2 Growth and domestic demand

**Economic growth during the first quarter was strong, exceeding the technical staff's projections presented in the previous report.** In that period, the economy expanded at an annual rate of 8.5% (original series) and 8.2% (seasonally adjusted and corrected for calendar effects). The latter result exceeded the technical staff<sup>40</sup> projection (7.2 %), which placed the first quarter GDP level at 7.9%, a figure above the value observed in the last quarter of 2019 (Graph 3.7). An expansionary monetary policy at the beginning of the year, accumulated savings during the most critical periods of the pandemic, better employment indicators, dynamic public consumption and credit growth, among other factors, were decisive in driving the economic recovery. This occurred together with a good dynamic of the trading partners, which facilitated the expansion of exports, especially non-traditional ones. In terms of supply, the services, trade and manufacturing industries continued to expand at levels above those recorded before the pandemic. In contrast, the agriculture sector contracted (-2.4 % annually), and the mining and construction sectors remained below pre-pandemic levels.

39 Data on the annual PPI change and that of its different components for the last available month is provisional. The DANE officially confirms or corrects the data the following month.

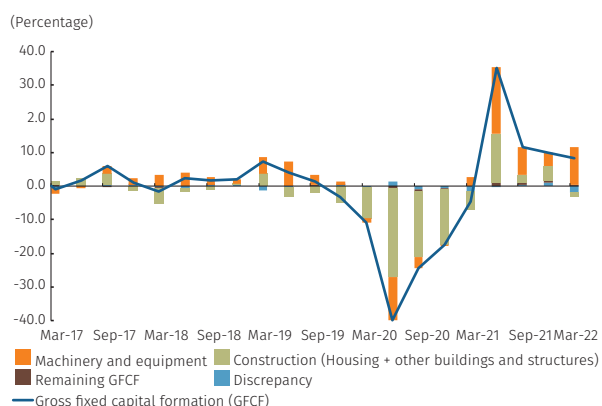
40 As took place during 2021, growth during the first semester of 2021 had a surprising upturn. The factors that explain the error in the economic activity behavior forecast for 2021 are summarized in Box 3.

**Graph 3.9**  
Demand components levels relative to 4Q 2019<sup>a/</sup>



a/ Seasonally adjusted and corrected for calendar effects  
Source: DANE, calculations by Banco de la República.

**Graph 3.10**  
Quarterly gross fixed capital formation<sup>a/</sup>  
(Annual change, contributions)



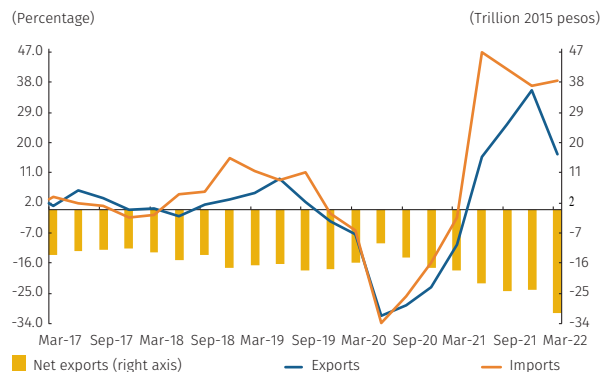
a/ Seasonally adjusted and corrected for calendar effects  
Source: DANE, calculations by Banco de la República.

**In the first three months of the year, growth continued to be primarily supported by consumption and investments in machinery and equipment.** The first of these components, which reports the largest share in GDP, expanded at an annual rate of 11.7%. The main contribution to this increase came from private consumption, which in the first quarter grew by 12.0% annually (Graph 3.8), or 15% above its pre-pandemic level (Graph 3.9). Consumption of services by segments continued to register strong dynamics and contributed to almost two-thirds of this expansion. However, the consumption of durable and semi-durable goods also showed very favorable performances, growing at double-digit annual rates, and were the subcomponents of private consumption that most exceeded their pre-pandemic levels. The favorable performance of household consumption at the beginning of the year continued to be supported by the recovery in employment, the wide availability of credits offered at relatively low interest rates in real terms, and transfers from the Government to households, among other factors. On the other hand, public consumption also contributed significantly to growth, increasing by 8.6% annually in the first three months of the year. This component would have been driven, above all, by the hiring of public employees and the higher expenses associated with social programs. The other component that marked the performance of domestic demand was the investment in machinery and equipment, with an annual growth of 25.6%, largely as a result of increased spending on transportation equipment. This figure marked a historic high for this component in the first quarter. Likewise, in terms of annual variations, this component contributed the most to the growth of gross fixed capital formation (Graph 3.10).

**The remaining investment components performed much more modestly, with levels still below pre-pandemic levels.** Investment in construction showed the largest lag within the expenditure components, remaining about 22% below its pre-pandemic level. By component, housing investment showed a 2.0% annual drop in the first quarter, and its levels were virtually flat compared to those of February 2021. Within the sector, social interest housing construction continued to be the most dynamic segment. Meanwhile, investment in other buildings and structures showed a similar annual downturn (of 2.7%), consistent with the poor performance of civil works (on the supply side) and non-residential buildings (building census).

**Imports grew at a significant rate in the first quarter, driven by the strong expansion of domestic demand, which led to an increase in the trade deficit despite the annual growth of exports.** The solid performance of private consumption and a portion of investment drove significant growth of imports, which showed strong dynamism in the first quarter, increasing by 38.6% annually and 10.6% quarter-on-quarter. The most dynamic component of imports was capital goods, including purchases of transportation equipment. In turn,

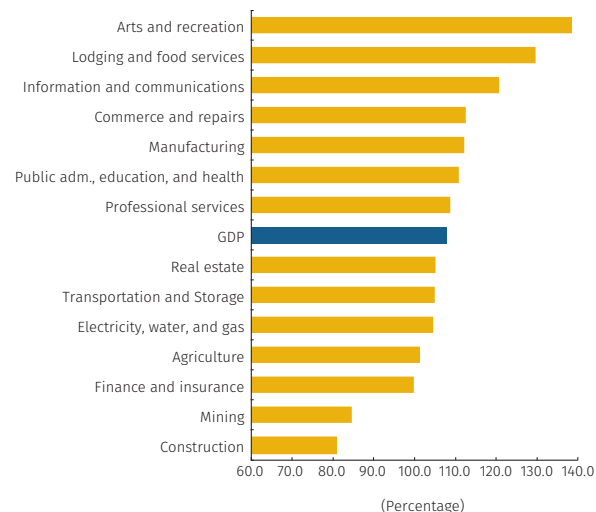
**Graph 3.11**  
Exports, imports and trade balance<sup>a/</sup>  
(annual change and trillion 2015 pesos)



a/ Seasonally adjusted and corrected for calendar effects  
Source: DANE, calculations by Banco de la República.

exports expanded at a noteworthy annual rate (16.7%) during this period, despite a small drop compared to the high levels seen in the fourth quarter of 2021. The most dynamic items in the first months of the year were non-traditional exports and services. In the case of the former, their performance would have been favored, among other factors, by the recovery of trading partners and, to some extent, by increased trade activity with Venezuela<sup>41</sup> (from almost zero levels in recent years). Meanwhile, services exports would have been driven mainly by foreign tourism. In contrast, traditional exports registered a less favorable performance in the first quarter: exported quantities of coal, oil and coffee dropped versus numbers recorded by yearend 2021 by 16.8%, 7.8% and 3.5%, respectively. The foregoing led to a widening of the trade deficit in constant pesos during the first quarter, which reached historical levels of 13.0% of GDP (Graph 3.11).

**Graph 3.12**  
Sectoral value added in 1Q 2022 relative to 4Q 2019<sup>a/</sup>  
(4Q 2019 = 100%)

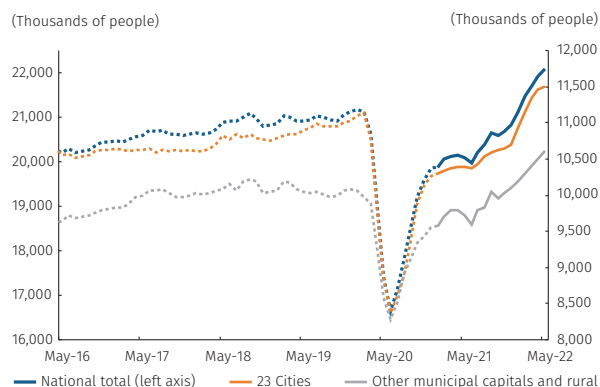


a/ Seasonally adjusted and corrected for calendar effects  
Source: DANE, calculations by Banco de la República.

**Except for the agriculture sector, all major supply sectors grew year-on-year, with service activities, commerce, and the manufacturing industry accounting for a significant portion of the increase.** The lodging and food service, arts and recreation, and financial and insurance activities sectors registered surprisingly strong growth in the first quarter of the year. In particular, the lodging and food service sector, driven by the strong recovery in domestic demand, continued displaying one of the strongest year-on-year growths, approximately 30% over fourth-quarter 2019 values. Similarly, the arts and entertainment activities sub-branch maintained its strong growth, which is linked to the resumption of these types of activities and the solid growth of gambling and online games of chance. In contrast, the agricultural branch contracted on a year-on-year basis, and the coffee segment saw a 17.5% downturn. By the end of the first quarter, all sectors excluding mining and construction had reached or exceeded pre-pandemic levels (Graph 3.12). In mining, both coal mining and oil and gas exploitation continue to lag, although, as explained in Chapter 2, the high prices of these raw materials suggest that recoveries can be expected over the forecast horizon. As for construction, the building segment continues to remain below 2019 year-end levels, despite the strong housing sales dynamics of 2021. Value added in civil works lags by 33.0% compared to pre-pandemic records, even though multiple infrastructure projects would have secured their financing.

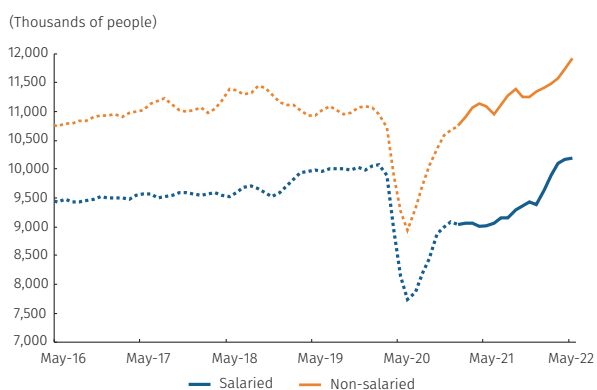
41 In the first quarter, non-traditional dollar exports to Venezuela grew by 112.6% in annual terms and represented 3.0% of total non-traditional exports.

**Graph 3.13**  
Employed population by location



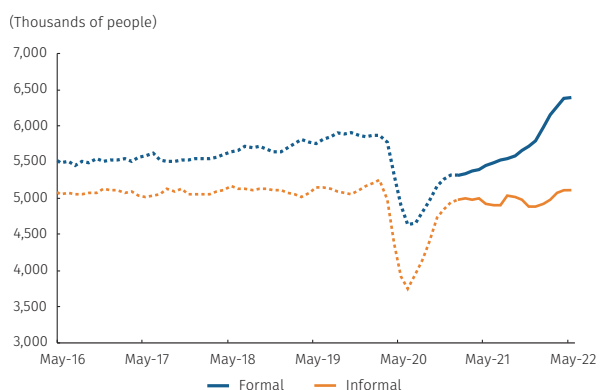
Note: Corresponds to mobile seasonally adjusted data, the dotted lines represent chain-linked series growth, solid lines correspond to 2018 GEIH Framework.  
Source: DANE (GEIH), calculations by Banco de la República.

**Graph 3.14**  
Jobs by type of employment: National total



Note: Corresponds to mobile seasonally adjusted data, the dotted lines represent chain-linked series growth, solid lines correspond to 2018 GEIH Framework.  
Source: DANE (GEIH), calculations and projections by Banco de la República.

**Graph 3.15**  
Formal and informal employment: 23 cities



Note: Corresponds to mobile seasonally adjusted data, the dotted lines represent chain-linked series growth, solid lines correspond to 2018 GEIH Framework.  
Source: DANE (GEIH), calculations by Banco de la República.

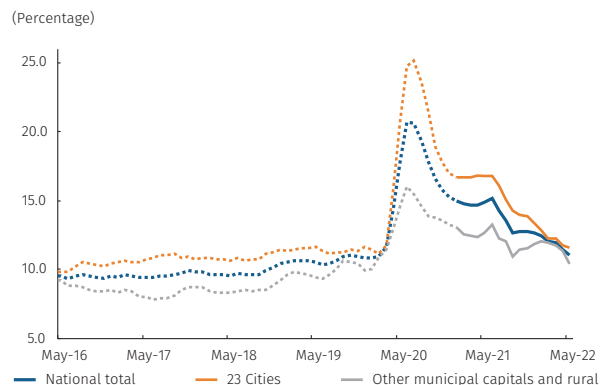
### 3.3 Labor market<sup>42</sup>

**The most recent labor market information continues to show sustained employment growth.** As of May, statistics from the General Integrated Household Survey (GEIH for its Spanish acronym) on a rolling quarterly basis show annual employment growth of 10%. Urban areas and other municipalities and rural areas contributed to this lively performance, with annual growth of 10.7 % and 9.2 %, respectively. As compared to 2019 statistics, employment levels have exceeded those observed in the pre-pandemic period across all geographic areas (Graph 3.13). By sector, the largest employment gains were centered in commercial activities, lodging, transportation and storage, and recreation and other services activities, which contributed 2.3 percentage points (pp), 1.6 pp and 1.5 pp, respectively, to the total annual change in employment. By population groups, the greatest contributors were women, people between 29 and 65 years of age, individuals who have completed their secondary education, and non-heads of household.

**The dynamic performance of employment has been driven mainly by the salaried employment.** As of May, this segment registered an annual growth of 13.0%, while non-salaried employment grew at an annual rate of 7.5% (Graph 3.14). Within the salaried group, the growth of the private sector (workers and private employees) is noteworthy, as it contributed 6.6 percentage points (pp) to the total annual change in employment. In line with these results, there has been a significant recovery in formal employment in urban areas, while its informal counterpart remains at relatively stable levels (Graph 3.15). This has allowed for a significant drop in the informality rate during the last few months, settling at 44.5% in May, the lowest point in the series' recent history. Information from administrative records, such as the number of dependent contributors to the PILA pension system, professional risk

42 The analysis of the labor market in this report was conducted with results from the GEIH Framework 2018, whose results were collected simultaneously beginning in January 2021. This is done with the goal of providing historical comparisons used in provisional chain-linking, calculated by Banco de la República's technical staff, that considers the dynamic observed in the previous survey (GEIH Framework 2005), growth factors in the national census from 2018, and changes in the definition of the working-age population. It is important to note that this chain-linking does not control for potential changes introduced in the new survey as a result of updates to the geostatistical framework and, consequently, is an approximation of the dynamics that could be observed in labor market statistics within the new framework. Chain-linked figures can include some margin of error, especially for periods in which large populational changes are observed, as was the case during the pandemic. The labor market is seasonal, which is to say that its values are systematically higher or lower depending on the month of the year. This phenomenon needs to be isolated using statistical techniques in order to make comparisons between months in the same year. As a result, the information presented in this section corresponds to the series without those calendar effects, known as a seasonally adjusted series. For a detailed analysis of the labor market based on this chain-linking exercise, see Box II of this report and Banco de la República's Labor Market Report, available at <https://www.banrep.gov.co/es/reporte-mercado-laboral>.

**Graph 3.16**  
Unemployment rate by location

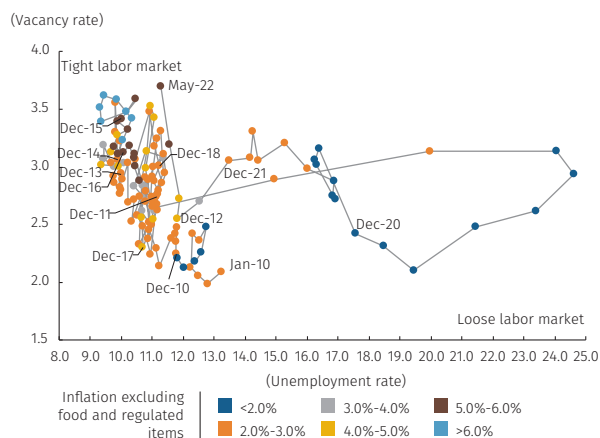


Note: Corresponds to mobile seasonally adjusted data, the dotted lines represent chain-linked series growth, solid lines correspond to 2018 GEIH Framework  
Source: DANE (GEIH), calculations and projections by Banco de la República.

enrollees and administrators (ARL) and family compensation funds confirms these results, which are at an all-time high.

**Positive employment performance has led to a significant drop in the unemployment rate.** In recent months, labor force participation registered a slower growth rate; however, with figures as of May, it is now closer to pre-pandemic levels for all geographic areas. This, together with greater dynamism in job creation, has allowed for a continuous decline in the unemployment rate (UR), especially in urban areas, where supply pressures have been lower. As of May, the seasonally adjusted quarterly unemployment rate stood at 11.1% for the national aggregate, and 11.6% for the aggregate of twenty-three cities (Graph 3.16). The national UR is found at levels comparable to those reported prior to the pandemic, while that of the twenty-three cities is still slightly above. The largest contractions in the last year occurred in Neiva (-9.4 pp), Bucaramanga (-7.7 pp) and Tunja (-7.2 pp). By gender, the drop in UR is mainly observed among women; however, the gender gap in this statistic remains above pre-pandemic levels, given the increased participation of women in the labor force.

**Graph 3.17**  
Beveridge curve for seven largest cities



Notes: Seasonally adjusted series. Moving quarter. GEIH Vacancy rate estimated based on hires according to Morales, Hermida and Dávalos methodology (2018).  
Source: DANE (GEIH), Banco de la República.

**Different labor indicators from the demand side suggest a tighter labor market.** Information from Banco de la República's quarterly survey of economic expectations (ETE for its Spanish acronym) and the ManpowerGroup Employment Outlook Survey indicates a significant increase in firms' hiring expectations, which have been at historically high levels since the fourth quarter of 2021. This performance would be in line with the dynamics observed in job vacancy indicators, calculated based on classified ads, the Public Employment Service (PES), the GEIH and the PILA, which show a persistent upward trend. Information from the quarterly survey of economic expectations (ETE) also shows a significant increase in hiring bottlenecks. The high growth in vacancies, coupled with the drop in UR (ratio represented in the Beveridge curve<sup>43</sup>), suggests a tighter labor market (Graph 3.17). It should be noted that, although the information from the GEIH and the administrative records of the PILA show an increase in current income (especially in the non-salaried segment), higher inflation has kept it at relatively stable real levels.

### 3.4. Financial and money market

**Financial conditions continued to be adjusted in the second quarter within an increasingly dynamic credit scenario.** Between September 2021 and June 2022, Banco de la República's Board of Directors (BDBR) raised the overnight repo rate (MPR) from 1.75 % to 7.50 %, an increase that has been passed on to nominal savings and credit interest rates in varying degrees. Despite

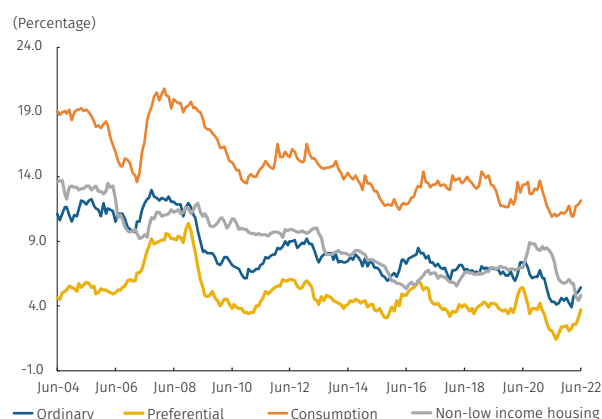
43 The Beveridge curve is the graphical representation of the relationship between the job vacancy rate and the unemployment rate.

**Table 3.1**  
Average monthly interest rates  
(percentage)

	Feb-20	Sep-21	Dec-21	Mar-22	Jun-22
<b>Interbank</b>					
Policy rate	4.25	1.76	2.70	4.00	6.00
Interbank overnight	4.26	1.79	2.73	4.06	6.06
BBI overnight	4.25	1.77	2.72	3.99	6.02
BBI 1-month	4.25	1.93	2.96	4.77	6.77
BBI 3-month	4.25	2.27	3.36	6.06	7.78
BBI 6-month	4.27	2.76	3.96	7.38	8.71
<b>Deposits</b>					
Savings	2.37	0.97	1.19	1.82	2.82
DTF 90-day	4.46	2.05	3.08	4.97	7.72
CD 180-day	4.69	2.45	3.71	5.63	8.40
CD 360-day	5.36	3.16	5.10	7.59	10.75
CD > 360-day	5.71	3.68	7.14	9.55	14.37
<b>Credit</b>					
Preferential	7.01	4.98	6.00	8.09	10.82
Ordinary	9.74	7.34	8.18	10.33	12.62
Non-low income housing construction	9.35	7.46	7.92	9.97	11.59
Low income housing construction	9.08	6.86	7.33	9.50	12.56
Non-low income housing purchases	10.50	9.06	9.40	10.32	12.01
Low income housing purchases	11.89	10.98	11.55	12.23	13.68
Personal loan consumption	17.09	17.09	17.51	19.56	23.08
Payroll lending consumption	13.55	11.23	11.65	12.50	13.83
Credit card	25.48	23.49	24.47	25.39	28.02

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

**Graph 3.18**  
Real commercial credit interest rates  
(average monthly data deflated with CPI excluding foods)



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

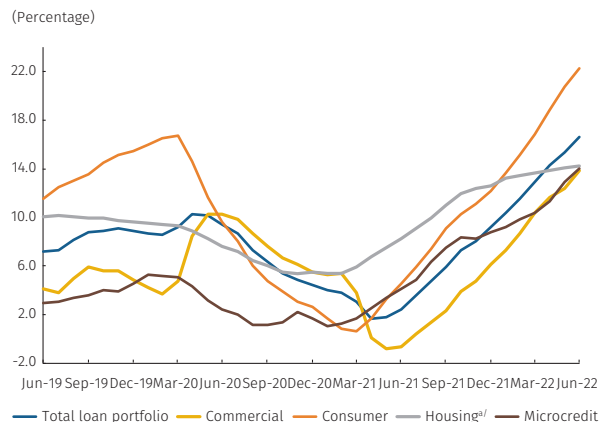
this, rates in real terms continue below the average of the last decade. At the same time, credit dynamics continue to strengthen, with a notable increase in consumer loans, which provide financing for household spending. Also, companies, impacted by the higher costs, have found credit available to meet working capital needs. Favorable lending activity is taking place in a high solvency environment for credit institutions, coverage of portfolio deterioration, a cycle of higher revenues and lower provisioning expenses. This has been reflected in an increase in profits for these establishments, expanding the credit potential to support economic activity.

**The increases in the policy interest rate continue to have an impact on interbank, savings and credit interest rates, although they remain low in real terms (except for credit cards).** The levels of the one-day interbank rate (IBR) and the benchmark banking indicator (BBI) continue to follow a similar path to that of the policy interest rate, while longer-term IBRs (which suggest expectations of higher money market interest rates) were higher than the MPR during the quarter: 44 bp and 122 bp for one month and three months respectively, and 226 bp for six months (Table 3.1). Deposit rates have also increased, with greater magnitude on longer maturities. Since September 2021, the increase in sight-deposit savings rates has been 186 bp, while that for CDs has increased by 567 bp for ninety days, 759 bp for one year and 1069 bp for maturities over one year. For the same period, the cumulative credit interest rate increases consisted of 584 bp for preferential loans, 413 bp for non-VIS construction loans, 599 bp for consumer loans and 259 bp for consumer loans cover by automatic payroll deductions. Despite the increases in nominal interest rates, in real terms levels continue to be below the average of the last decade (Graph 3.18).

**Credit in pesos continues to perform well across all modalities and continues to support economic growth.** Total peso-denominated bank credit accelerated, reaching an annual growth of 16.6% in June, compared to 13.0% in March (Chart 3.19). This was the result of a quarterly variation of COP 28.5 trillion, largely directed to commercial (COP 14.7 t) and consumer (COP 10.4 t) credits. Similar to observations made at the beginning of the year, the acceleration of the commercial portfolio in the second quarter would be explained by disbursements at less than one year, both of preferential and ordinary loans, suggesting a greater demand for working capital, probably associated with the higher production costs. Large companies have also changed their sources for funding from foreign to domestic currency, given their greater share in the growth of commercial credit in pesos and the lower balance of the foreign currency portfolio.<sup>44</sup> As of June, microcredits showed an annual growth of 14.0%, a

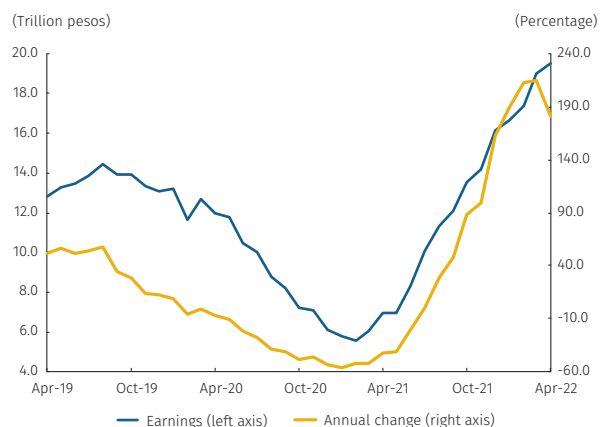
44 USD 278 m in the quarter and USD 736 m in the year so far.

**Graph 3.19**  
Gross national currency loan portfolio  
(annual change, average monthly data)



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

**Graph 3.20**  
Credit establishment earnings  
(cumulative 12-month and annual change)



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

performance close to that of the commercial portfolio, but with a more moderate growth trend. Consumer loans are the most dynamic component, with an annual quarter-on-quarter charge of 16.8% to 22.3%. This has contributed to the financing of household spending, characterized by loans with terms of more than three years and a growing share of disbursements non-covered by automatic payroll deductions. For its part, the annual growth for housing purchases loans has shown a stable trend, registering at 14.2% in June, with mostly fixed-rate disbursements granted, and with an increase in the share for low-income housing.

**Loan portfolio deterioration has shown signs of moderation, has stabilized the need for loan portfolio provisions and strengthened the profits of credit establishment.** With information available (to April), accumulated earnings for the previous twelve months amounted to COP 19.5t, 21% higher than in December 2021 and 49% higher than in 2019 (Chart 3.20). This was driven by higher revenues from the strengthening of loan portfolio placement and by intermediation favored by the high solvency of credit institutions, as well as lower expenses in provisions, partly due to the reduction of the non-performing loan portfolio. Nonetheless, default and credit risk indicators are still above those observed in yearend 2019.



## Box 1: A Weekly Indicator of Economic Activity for Colombia

Juan Pablo Cote  
Carlos Daniel Rojas  
Nicol Rodríguez\*

The diagnosis of economic activity is one of the main inputs used in the forecasting process of *Banco de la República's* technical staff. This process employs diverse sources of information, including sectoral indicators, information derived from surveys and, more recently, series published by various commercial banks on household spending.

Nevertheless, part of this dataset suffers from relatively large time lags, which in some cases can be up to several months. While lags in series such as the unemployment rate, industrial production, or the economic tracking indicator, may not be of great consequence under slowly evolving conditions, they acquire relevance in situations of high uncertainty and rapid and substantial changes. Under such conditions, the use of traditional indicators may be uninformative or could even be the source of significant forecast errors.

The purpose of this Box is to present the weekly economic tracking indicator (hereinafter ISAE for its Spanish acronym), a new high-frequency indicator that seeks to overcome these limitations by combining series with different periodicities. A detailed explanation of this indicator and its diagnostic and predictive properties can be found in the document by Cote-Barón *et al.* (2022).

### 1. Structure of the weekly economic tracking indicator estimate (ISAE)

The ISAE is based on a simple idea: although very good indicators exist to assess the behavior of aggregate economic activities, they all have idiosyncratic components that introduce diagnostic distortions (i.e., measurement errors, historical revisions, or particular events in a productive branch). Consequently, the ISAE aims to treat economic activity dynamics as a latent factor common to a large number of variables, while also allowing for missing values in many of these series. The latter is convenient, given that the most precise information often has the greatest publication lag. To this end, the objective is to extract the indicator from 32 variables of different frequencies and lengths: 10 weekly series, 19 monthly series and 3 quarterly series (Table B1.1).

The methodology used for this purpose is a mixed-frequency dynamic factor model. This type of model has been widely used in its different versions in economic literature for both diagnostic and forecasting purposes (Stock & Watson, 2012). Specifically, the indicator proposed considers three frequencies (quarterly, monthly, and weekly) that require the aggregation relationships to vary over time, given calendar irregularities. To this end, the estimation follows Baumeister *et al.* (2021).

\* The authors are analysts at *Banco de la República's* Programming and Inflation Department. The views and opinions expressed herein do not necessarily reflect those of the Bank or its Board of Directors.

Table R1.1  
Variables employed in the dynamic factor model

Frequency	Variable	Source
Quarterly	Real GDP	DANE (National Administrative Department of Statistics)
	Total area: finished and in process construction works	DANE, Census of Buildings (CEED)
	Industry installed capacity utilization	Fedesarrollo, Entrepreneurial Opinion Survey (EOE)
Monthly	Tons of solid freight transported by road	Ministry of Transport
	Unemployment rate	DANE, Integrated Household Survey (GEIH)
	Number of unemployed	DANE (GEIH)
	Real industrial production	DANE, Monthly Manufacturing Survey, territorial focus (EMMET)
	Index of real retail sales without vehicles and fuels	DANE, Monthly Trade Survey (EMC)
	Real income of hotels	DANE, Monthly Hotel Survey (EMA)
	Economic Monitoring Indicator (ISE)	DANE
	Amount of transactions in ACH Colombia (deflated with CPI)	ACH-Colombia and <i>Banco de la República</i>
	Consumer Confidence Index	Fedesarrollo, Consumer Opinion Survey (EOC)
	Industrial Confidence Index	Fedesarrollo (EOE)
	Commercial Confidence Index	Fedesarrollo (EOE)
	Index of business climate in 5 regions	<i>Banco de la República</i> , monthly survey of economic expectations (EMEE)
	Number of passengers transported by air	Civil Aviation Authority
	Industrial Production Index (IPI) - Mining	DANE
	Total exports index	<i>Banco de la República</i>
	Total imports index	<i>Banco de la República</i>
	Cardboard box index	<i>Banco de la República</i>
Risk perception index (IDOAM)	<i>Banco de la República</i>	
Regional economic pulse	<i>Banco de la República</i>	
Weekly	Google mobility reports	Google
	Fuels dispatches	SICOM, National mining and energy information system
	Unregulated Energy Demand	XM, Colombian power system operator and wholesale energy market administrator
	Google Trends: food & beverages	Google
	Google Trends: unemployment	Google
	Google Trends: real estate market	Google
	Google Trends: restaurant	Google
	VAT Collection	<i>Banco de la República</i>
	Consumer credit disbursements	Office of the Financial Superintendent of Colombia
	Monetary offer M2	<i>Banco de la República</i>

At a general level, the model assumes a latent weekly factor  $f_t$  common to the body of information used, and whose treatment of the series, according to the frequency, is as follows:

Weekly variable: 
$$y_{i,t} = \lambda_i f_t + u_{i,t}$$

Monthly variable: 
$$y_{i,t} = \lambda_i [c(m_t)]^{-1} (f_t + f_{t-1}) + \dots + f_{t-c(m_t)+1} + [c(m_t)]^{-1} (u_{i,t} + u_{i,t-1}) + \dots + u_{i,t-c(m_t)+1}$$

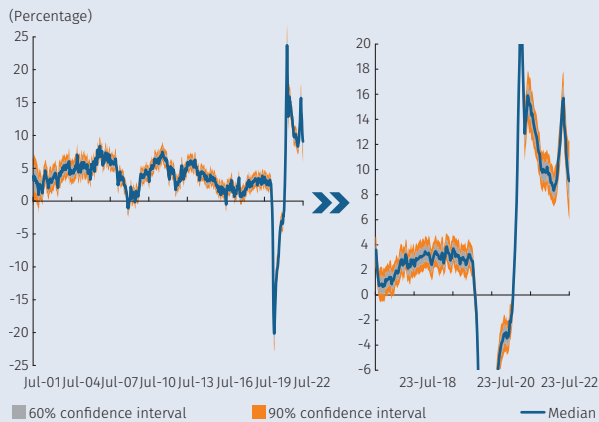
Quarterly variable: 
$$y_{i,t} = \lambda_i [d(q_t)]^{-1} (f_t + f_{t-1} + \dots + f_{t-d(q_t)+1}) + [d(q_t)]^{-1} (u_{i,t} + u_{i,t-1} + \dots + u_{i,t-d(q_t)+1})$$

where the months index is  $m=1, \dots, M$  with  $M$  being the total number of months in the database; the quarters index is  $q=1, \dots, Q$ , where  $Q$  is the total number of quarters in the sample, and  $c(m)$  and  $d(q)$  refer to the number of weeks in month  $m$  and in quarter  $q$ . Note that  $c(m)$  may equal 4 or 5, and  $d(q)$  could be 12, 13 or 14. Moreover, it is assumed that:

$$f_t = \phi_1 f_{t-1} + \phi_2 f_{t-2} + \phi_3 f_{t-3} + \phi_4 f_{t-4} + \epsilon_t \quad \epsilon_t \sim N(0, w^2)$$

$$u_{i,t} = \varphi_{i,1} u_{i,t-1} + \varphi_{i,2} u_{i,t-2} + \varphi_{i,3} u_{i,t-3} + \varphi_{i,4} u_{i,t-4} + \varepsilon_{i,t} \quad \varepsilon_{i,t} \sim N(0, \sigma_i^2)$$

**Graph R1.1**  
Weekly economic tracking indicator (ISAE)  
(Annual variation)



Source: Banco de la República.

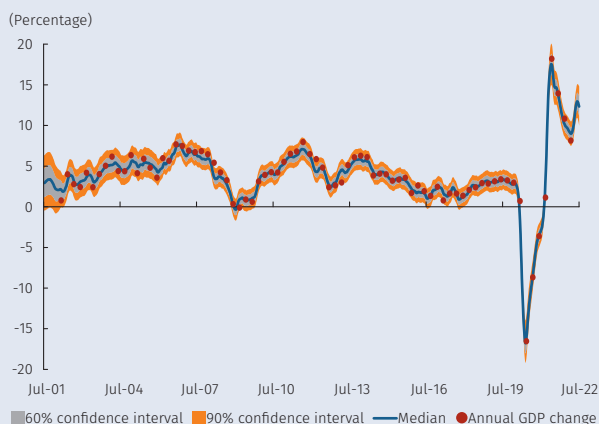
The state-space form of this system allows us to jointly estimate the model parameters, the common factor and the missing observations using the Kalman filter in a Bayesian framework. We define the ISAE as the factor  $f_t$  factor normalized such that its mean and variance are equal to those of the annual GDP growth.

## 2. Main findings

The ISAE estimation approach allows for construction of confidence intervals from the results of the different draws. For practical purposes, we will take the median thereof as the ISAE point estimate. This estimate, based on the information available by the end of the week of July 23, 2022, is shown in Graph B1.1, which also displays the 90% and 60% confidence intervals around it.

This estimate captures the trend changes between 2007-2008 and 2014-2015, as well as subsequent recoveries in economic activity. Additionally, the health crisis resulting from the Covid-19 pandemic is associated with a marked ISAE contraction and its ensuing recovery, exhibiting high annual growth rates due to the very low comparison bases in multiple indicators.

**Graph R1.2**  
ISAE twelve-week moving average and GDP  
(Annual variation)

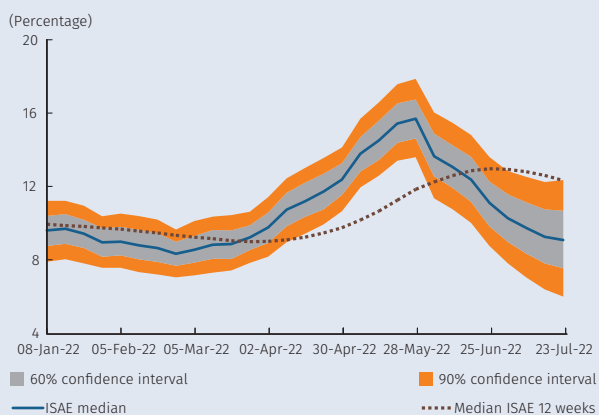


Source: Banco de la República.

In order to assess the relevance of the ISAE as an indicator of economic activity, it is useful to compare its dynamics with those of the GDP. Although the latter is one of the variables considered in the estimation, the underlying concept of the ISAE is that it is based on a latent factor common to all variables and therefore, technically, its dynamics should not be identical to those of the GDP. For comparative purposes, we will use the ISAE twelve-week moving average. Graph B1.2 displays this comparison, revealing that the differences between the twelve-week ISAE and the annual GDP change are quite small.<sup>1</sup>

For the second quarter of 2022, the ISAE suggests annual growth would have accelerated since the end of April, reaching its peak in the week ending May 28. This is consistent with the low comparison base resulting from the road blockades experienced last year. The ISAE's twelve week moving average suggests an annual expansion of close to 13% in the second quarter of this year (Graph B1.3).

**Graph R1.3**  
ISAE in 2022  
(Annual variation)



Source: Banco de la República.

## 3. Final considerations

The past two and a half years have been particularly uncertain, characterized by rapid and profound changes in economic growth trends. Given the lags in the usual macroeconomic series, it is useful to construct high-frequency indicators that make it possible to provide precise descriptions of economic conditions with a modest delay. The ISAE seeks to be a tool to help in this respect and complement the battery of models used by the technical staff of Banco de la República. Out-of-sample forecasting performance and revisions to estimates due to new data releases will be presented in Cote-Barón *et al.* (2022).

<sup>1</sup> Since 2002, the average absolute difference between the annual GDP change and the twelve-week ISAE median at the end of the quarter is 0.48 pp.

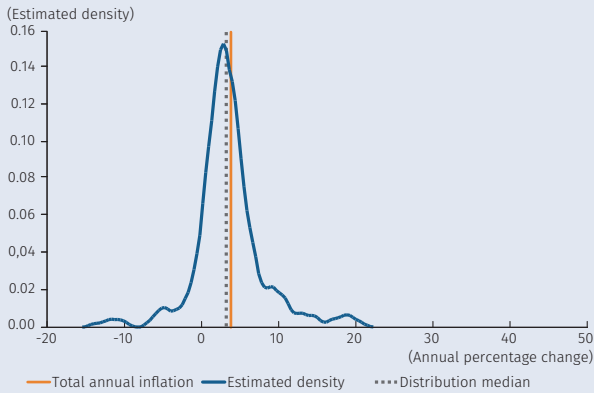
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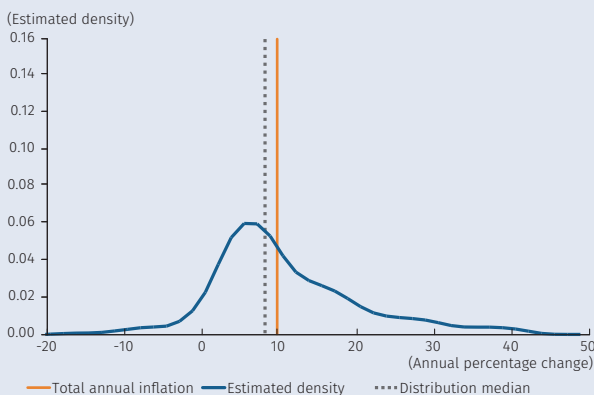
# Box 2: Common Inflationary Trends in Colombia

Graph R2.1  
Evolution of inflation diffusion in Colombia

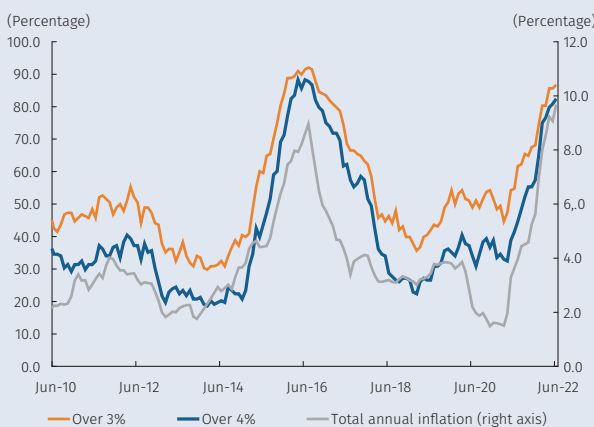
A. Distribution of the annual change in CPI subclasses in December 2019



B. Distribution of the annual change in CPI subclasses in June 2022



C. Total annual inflation and percentage of CPI subclasses with annual changes above 3.0% and above 4.0%



Sources: DANE and Banco de la República. Authors' calculations.

**Carlos D. Rojas-Martínez**  
**Nicolás Martínez-Cortés**  
**Franky Juliano Galeano-Ramírez\***

As of the second quarter of 2021, inflation in Colombia has risen sharply, with results that have consistently surprised the market consensus to the upside. There are various causes for this escalation, which have prompted various lines of questioning. Some of these are related to the persistence of the current inflationary phenomenon, and whether this is a generalized price increase or if it is specific to certain goods and services. This Box suggests a quantitative approach to resolve this line of inquiry.

A first approach to address the issue at hand is provided in Graph R2.1, which shows that the distribution of the annual variation of the consumer price index (CPI) subclasses changed significantly between December 2019 (panel A) and June of this year (panel B), becoming more dispersed and widening mostly towards its right tail. Meanwhile, the median annual change among subclasses increased from 3.2% to 8.0% between these two periods. Furthermore, the percentage of CPI subclasses adjusting above 3.0% and 4.0% in annual terms (panel C) have had a significant increase since the mid-2021. These indicators point to more widespread inflationary pressures.

## 1. Methodology

To quantitatively identify the extent of the generalized increase in prices, a dynamic factor model was used, estimated from 25 disjunct sub-baskets that together comprise all CPI items between December 2001 and June 2022. The model is a simplified version of those presented by Almuzara and Sbordone (2022), and Stock and Watson (2016). The fundamental idea behind this approach is to disaggregate the annual change in the price index of each sub-basket ( $y_{i,t}$ ) between a factor ( $f_t$ ) common to all sub-baskets and an idiosyncratic component ( $e_{i,t}$ ). That is:

$$y_{i,t} = c_i + \alpha_i f_t + e_{i,t}$$

with

$$\begin{aligned} f_t &= \eta_1 f_{t-1} + u_t & u_t &\sim i.i.d.N(0, \sigma_f^2) \\ e_{i,t} &= \rho_1 e_{i,t-1} + \varepsilon_{i,t} & \varepsilon_{i,t} &\sim i.i.d.N(0, \sigma_i^2) \end{aligned}$$

In order to obtain a measure of inflation comparable to total and core inflation (in this case, the CPI excluding food and regulated items), trend inflation is defined as:

$$Trend\ inflation = \sum_i \omega_{i,t} (c_i + \alpha_i f_t)$$

\* The authors are Analysts at Banco de la República's Programming and Inflation Department. The views and opinions expressed herein do not necessarily reflect those of the Bank or its Board of Directors.

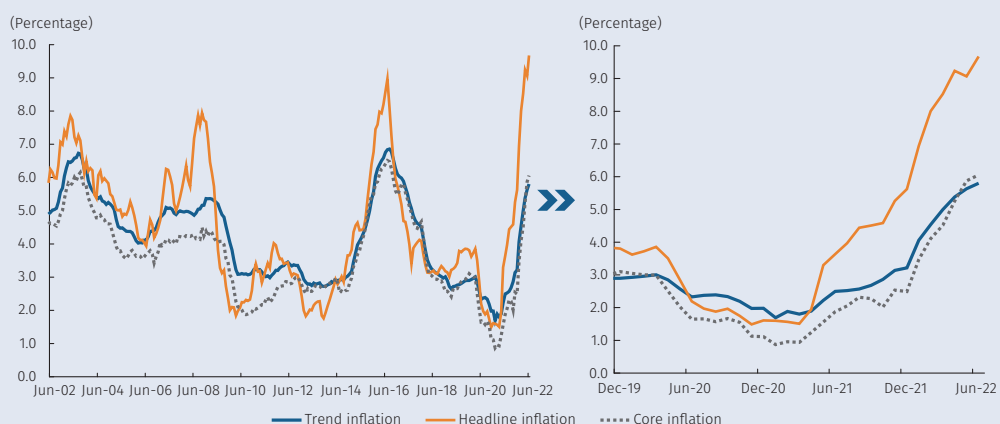
where  $\omega_{i,t}$  is the weight of sub-basket  $i$  in period  $t$ . Note that these vary over time as a consequence of changes in the CPI basket.<sup>1</sup>

## 2. Trend, headline, and core inflation

Trend inflation seeks to eliminate transitory and short-term variations in the inflation of the different sub-baskets. This is desirable insofar as the measurement aims to estimate the persistence and underlying components of the price variation. In other words, the goal is to filter out specific short-term changes that do not establish common trends. Typically, these changes have been caused by various supply shocks on food prices; however, more recently, indirect tax reliefs resulting from the Covid-19 pandemic have been applied to several goods and services, as well as subsidies or deferrals in the payment of public services.

Graph R2.2 compares trend inflation obtained with headline and core inflation, the latter measured by the annual change in CPI excluding food and regulated items. In general, the behavior of trend inflation is quite like that of core inflation, in particular from 2013. However, during the pandemic, their behavior exhibited drops of different magnitudes: while core inflation reached a low of 0.87% in January 2021, trend inflation stood at 1.69% during that period. Subsequently, the acceleration in core (and headline) inflation in mid-2021 and especially in 2022 coincides with a sustained increase in trend inflation, suggesting a further generalization of inflationary pressures between sub-baskets.

Graph R2.2  
Trend, total and core annual inflation



Sources: DANE and Banco de la República. Authors' calculations.

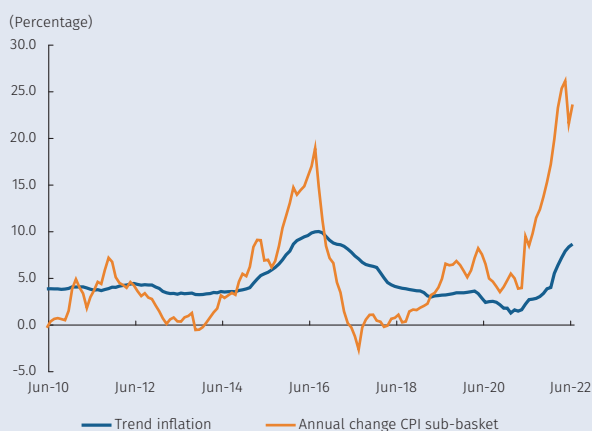
For June of this year, the trend indicator stands at 5.8%, while the annual change in CPI excluding food and regulated items stands at 6.1%, the average core inflation indicators tracked by Banco de la República stand at 7.1%, and headline inflation at 9.7%.

Graph R2.3 separates trend inflation between the main sub-baskets analyzed by Banco de la República (González-Molano et al., 2020). For this purpose, once the model with the 25 initial sub-baskets was estimated, the results were grouped according to class: goods excluding food and regulated items, services excluding food and regulated items, food and regulated items. Expected results were obtained both for the historical and recent domestic inflation characteristics and for the methodology applied. These included a significant smoothing of the movements of the observed variations, mainly for the food sub-basket, a lag in the movements of trend inflation compared to the movements of observed inflation and the detection of periods in which the direction of the trend measures match between

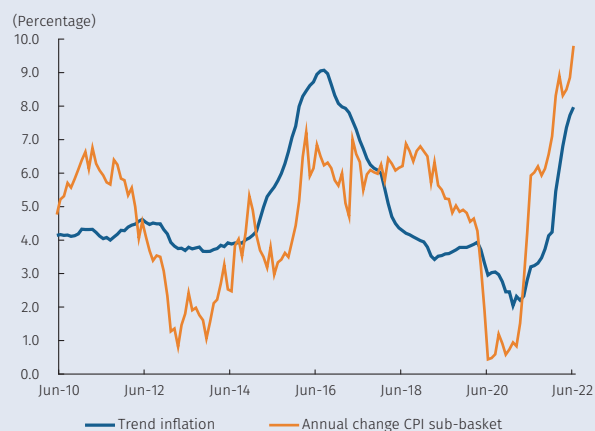
1 The estimate contemplates three methodological and updated CPI baskets: 1998, 2008, and 2018.

Graph R2.3  
Annual trend inflation and observed annual changes of the main CPI sub-baskets analyzed

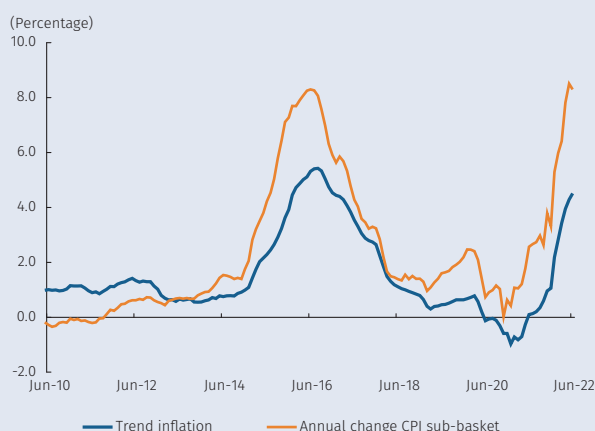
#### A. Food



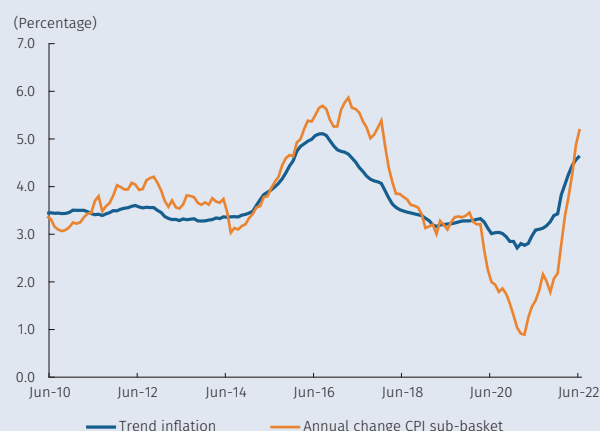
#### B. Regulated items



#### C. Goods excluding food and regulated items



#### D. Services excluding food and regulated items



Sources: DANE and Banco de la República. Authors' calculations.

sub-baskets. In this case, as of mid-2021 onwards, the upward trend inflation of all sub-baskets is worth noting.

The latter reinforces, as suggested by other indicators, that the current upward inflation episode in Colombia affects all sub-baskets, and that it includes a trend or persistent component. This is compatible with the reading of the situation by *Banco de la República's* technical staff. In general terms, an interpretation consistent with these results is that external and internal pressures, some of them of a transitory nature and affecting only some CPI segments (mainly goods excluding food and regulated items), have endured more than expected and have generated additional pressures—some of a less transitory and more generalized nature—via the different indexation mechanisms of the economy (especially on the services excluding food and regulated items, and on regulated items). This has been facilitated by excess demand, a tighter labor market, and rising inflation expectations.

However, as shown by previous episodes (e.g., 2008 and 2016), a significant correction in inflation, faster and sharper than the trend inflation measure estimated in this Box might indicate (Graph R2.2), cannot be ruled out. The monetary policy tightening process and a rapid tempering of external and domestic pressures would contribute thereto.

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## Box 3: Shock Decomposition of 2021 Forecast Errors

Nicolás Moreno Arias\*

After facing the worst recession in its history brought about by the COVID-19 pandemic in 2020, coupled with a sharp drop in inflation, the Colombian economy in 2021 experienced a rapid recovery in its gross domestic product (GDP) and a significant inflation acceleration. The fluctuations of these variables in 2021 were unexpected and surpassed the market average estimates and those constructed by the technical staff of *Banco de la República*, provoking considerable forecast errors. Of course, not all these surprises occurred in one single quarter, hence *Banco de la República's* technical staff identified the various sources of these unexpected developments in the Monetary Policy Reports (MPR) of 2021 and consistently readjusted its forecasts during the year.

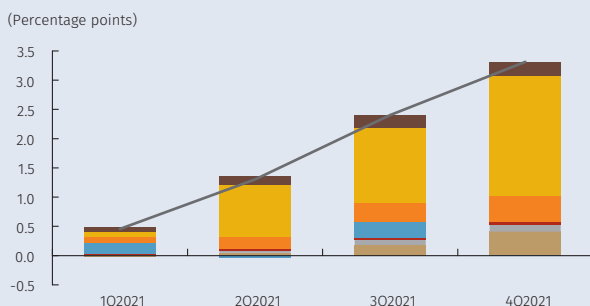
In this Box, we employ a strategy comparable to that described in De Castro-Valderrama *et al.* (2021)<sup>1</sup> and use the 4G model to identify the type of macroeconomic shocks that explain the forecast errors and to what degree. In other words, the model compares the data observed in 2021 to the forecasts published in the January 2021 MPR in terms of shocks.<sup>2</sup> This report in particular is used as a point of reference since it included the technical staff's initial economic outlook for 2021, prepared under the assumption that new surprises would not occur beyond those already included in said forecasts. This technique is applied to GDP growth (year-over-year and twelve-month)<sup>3</sup> and annual inflation (headline and core inflation). This exercise is part of a continual internal review process conducted by the technical staff on its forecasts.

### 1. Errors in headline and core inflation

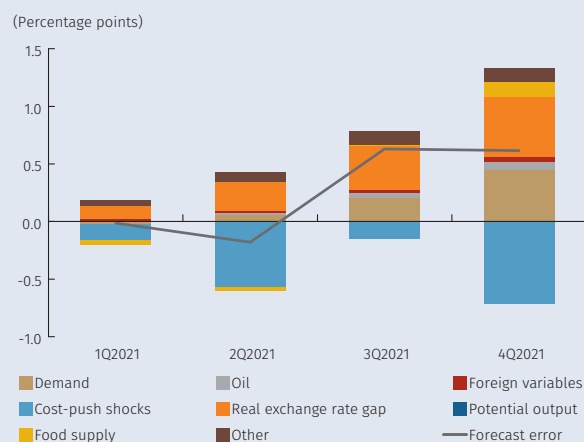
Graph B3.1 shows the decomposition of the forecast error of the 4G model, defined as the observed data minus the forecast. The decomposition illustrates higher forecast errors in headline inflation than in core inflation, primarily associated with the impact of the food basket shocks. This is consistent with the surprises generated by the national strike in the second quarter of 2021, the low production cycles for certain agricultural items, and the high transportation

Graph R3.1

#### A. Headline Inflation (YoY)



#### B. Core Inflation (YoY)



Source: DANE and Banco de la República. Author's calculations

\* The author is a Specialist at *Banco de la República's* Macroeconomic Models Department. The views and opinions expressed herein do not necessarily reflect those of the Bank or its Board of Directors.

- 1 This paper details a way to use a semi-structural general equilibrium model and the Kalman Smoother to build a multivariate filter to interpret the shocks behind forecasts and observed data to compare the economic stories that explain them.
- 2 The result of this procedure is a shock matrix that would allow reconstructing the observed data. Subsequently, the original matrix used to construct the MPR forecast for January 2021 is subtracted from this resulting matrix, thereby obtaining the shocks that explain the forecast errors.
- 3 Year-over-year GDP growth refers to the annual change in quarterly GDP, while twelve-month growth indicates the annual change in GDP (four-quarter cumulative).

costs experienced throughout the year. In addition, food prices were affected by the unexpected increases in the prices of some of these goods abroad, which were especially high in the second half of the year.

Foreign exchange rate pressures, measured by the real exchange rate gap, together with additional forces stemming from aggregate demand, also affected headline inflation. These two inflationary pressures were more intense on core inflation, although they were offset by more favorable supply shocks than initially contemplated by the technical staff. The latter shocks would capture the extension into the second quarter of 2021 of certain tax reliefs associated with the health emergency that the technical staff expected would be reversed during that period. Likewise, these shocks include the three VAT-free days decreed in the last quarter of the year, which had not been anticipated initially.

These decompositions made using the 4G model confirm that, for the most part, the inflation forecasting errors were the result of unexpected shocks that were difficult to foresee at the beginning of 2021, both as to their origin as well as their magnitude.

## 2. Errors in GDP growth

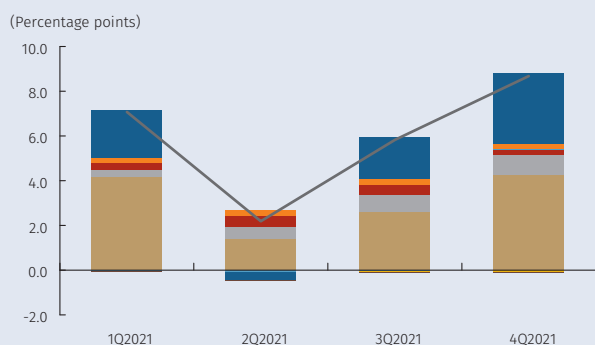
Regarding economic growth in 2021, Graph B3.2 shows that forecast errors were largely explained by the behavior of aggregate demand and, to a lesser extent, of potential GDP. After the initial COVID-19 crisis, the technical staff expected in its central macroeconomic scenario a moderate demand rebound,<sup>4</sup> given the social distancing measures decreed in January 2021 because of the pandemic, tax uncertainty, and the weakness of the labor market. However, the economy experienced a much more vigorous recovery throughout the year than originally expected.

The first surprise regarding economic growth occurred in the first quarter of the year and was mainly related to an overestimation of the effects the resurgence of the pandemic will have on private consumption. This is illustrated in Graph B3.2, wherein it can be seen that the shock that contributed most to the quarterly GDP error was the demand shock. The behavior of potential output also played a part in the forecast error since, based on the technical staff's criteria, the pandemic is considered to also entail contractions of the economy's productive capacity. In the third and fourth quarters of 2021, the year-over-year GDP growth was also higher than expected due to a new upsurge in demand, better oil prices and lenient external financial conditions. Nevertheless, much of this underestimation in the second half of the year is associated with the initial surprise of the first quarter of 2021, which explains why the demand shock exerted a cumulative upward pressure on twelve-month GDP growth.

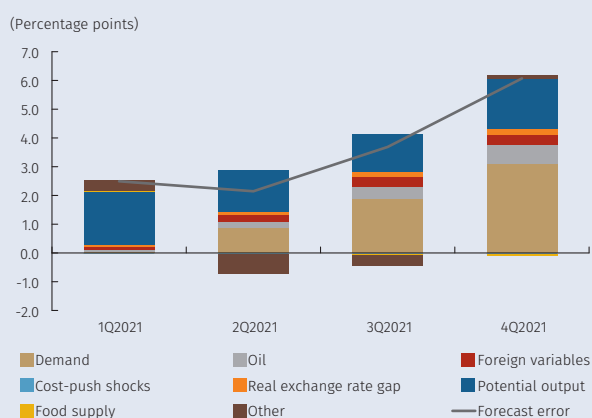
The correction of the forecast error in the second quarter of 2021 is also quite apparent in Graph B3.2, both in year-over-year and twelve-month GDP growth. This correction occurs as a consequence of the national strike and the new infection wave of the pandemic. Although these shocks were not expected by the Central Bank's technical staff in January, they brought the data closer to the forecast value, which further confirms the unusual behavior of consumption during the first quarter of 2021. It is worth noting that because the strike

Graph R3.2

### A. YoY GDP growth



### B. Twelve-month GDP growth



Source: DANE and Banco de la República. Author's calculations

<sup>4</sup> The recovery was expected to be underpinned by better terms of trade, ample external financing, higher household and business confidence, and low interest rates.

was a temporary negative supply shock, it affected the potential output estimate more as opposed to that of demand in the second quarter of 2021.

Finally, the shock decompositions of Graph B3.2 reveal that those that actually materialized in the data and were not foreseen in January 2021 coincided with the number of surprises identified in the economic activity series and which were gradually recognized in the various Monetary Policy Reports published along the year. Accordingly, this corroborates that *Banco de la República's* technical staff underestimated the behavior of both potential output and aggregate demand, but that the sources of their forecast errors were unforeseeable shocks that significantly stimulated growth, even in an environment of rising inflation, high public indebtedness levels, and widespread global and national uncertainty.

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## Annex 1

### Macroeconomic projections from local and foreign analysts<sup>a/, b/</sup>

	Units	Jul-22	Dec-22	Jul-23	Dec-23	Jul-24
Total CPI	Monthly Variation (average)	0.53	n. a.	n. a.	n. a.	n. a.
CPI excluding foods	Monthly Variation (average)	0.53	n. a.	n. a.	n. a.	n. a.
Total CPI	Annual Variation (average), end of period	9.90 <sup>c/</sup>	9.32	5.86	5.33	4.27
CPI excluding foods	Annual Variation (average), end of period	7.08 <sup>c/</sup>	7.58	5.66	5.04	4.04
Nominal exchange rate	Pesos per dollar, end of period	4,493	4,155	4,050	4,000	3,992
Policy rate	Percentage, end of period	9.00	9.00	8.25	7.50	6.00

	Units	II-2022	III-2022	IV-2022	2022	I-2023	II-2023	III-2023	IV-2023	2023	I-2024	II-2024
GDP	Annual variation, original series	10.5	5.0	3.2	6.4	3.3	3.1	3.3	3.0	3.1	3.0	n. a.
Unemployment	Thirteen cities, average for period	10.8	10.7	10.4	n. a.	11.2	10.4	10.4	9.9	n. a.	10.7	n. a.
IBR (90 days)	Effective annual rate, end of period	n. r.	9.0	9.1	n. a.	9.0	8.6	7.9	7.4	n. a.	6.8	6.4
DTF	Effective annual rate, end of period	n. r.	9.1	9.5	n. a.	9.3	9.0	8.2	7.9	n. a.	7.5	6.8
Fiscal Deficit (NCG) <sup>d/</sup>	Percentage of GDP	n. a.	n. a.	n. a.	5.9	n. a.	n. a.	n. a.	n. a.	4.4	n. a.	n. a.
Current Account Deficit <sup>d/</sup>	Percentage of GDP	n. a.	n. a.	n. a.	5.0	n. a.	n. a.	n. a.	n. a.	4.4	n. a.	n. a.

n. a.: not available.

n. r.: not relevant given that data is already observed.

a/ Starting with the April 2020 Monetary Policy Report, the survey of foreign and local macroeconomic analysts has been suspended and data corresponding to *Banco de la República's* Monthly Survey of Economic Analyst Expectations is included.

b/ Corresponds to the median response from *Banco de la República's* Monthly Survey of Economic Analyst Expectations, except for the total CPI and CPI excluding food, which correspond to averages.

c/ Data calculated based on the results of *Banco de la República's* Monthly Survey of Economic Analyst Expectations.

d/ Positive values represent deficit and negative values represent surplus.

Source: Monthly Survey of Economic Analyst Expectations, *Banco de la República*, June 2022.

## Annex 2

# Main macroeconomic forecast variables

		Years										
		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
<b>Exogenous variables</b>												
<b>External <sup>a/</sup></b>												
Trade partners GDP <sup>b/</sup>	Percentage, annual change, seasonally adjusted	3,6	2,7	2,1	1,6	2,6	2,5	1,4	-6,7	7,0	<b>2,4</b>	<b>2,0</b>
Oil price (Benchmark Brent)	Dollars per barrel, average for period	109	99	54	45	55	72	64	43	71	<b>103</b>	<b>91</b>
Federal funds (Fed) effective interest rate	Percentage, average for period	0,11	0,09	0,13	0,39	1,00	1,83	2,16	0,36	0,08	<b>1,58</b>	<b>3,63</b>
Credit default swaps at 5 years for Colombia	Basis points, average for period	113	101	184	212	129	114	99	142	142	<b>257</b>	<b>243</b>
<b>Domestic</b>												
Colombia real neutral interest rate	Percentage, average for period	1,5	1,4	1,5	1,6	1,3	1,3	1,2	1,3	1,5	<b>2,0</b>	<b>2,2</b>
Potential (trend) GDP	Percentage, annual change	4,3	3,9	3,3	2,7	2,4	2,3	2,4	-0,1	4,4	<b>4,4</b>	<b>2,5</b>
<b>Endogenous variables</b>												
<b>Prices</b>												
Total CPI	Percentage, annual change, end of period	1,94	3,66	6,77	5,75	4,09	3,18	3,80	1,61	5,62	<b>9,69</b>	<b>5,67</b>
CPI excluding food <sup>c/</sup>	Percentage, annual change, end of period	2,46	3,28	5,25	5,51	5,03	3,51	3,45	1,03	3,44	.	.
CPI tradable (excluding food and regulated items)	Percentage, annual change, end of period	0,86	1,75	7,27	5,91	3,24	1,40	2,18	0,63	3,31	.	.
CPI non-tradable (excluding food and regulated items)	Percentage, annual change, end of period	3,67	3,34	4,64	5,26	5,38	3,13	3,45	1,29	2,18	.	.
CPI regulated items	Percentage, annual change, end of period	1,56	4,89	4,43	5,63	6,26	6,65	4,81	0,73	7,10	<b>10,32</b>	<b>7,21</b>
CPI food <sup>d/</sup>	Percentage, annual change, end of period	-0,23	5,24	13,08	6,65	0,48	1,87	5,80	4,80	17,23	<b>16,94</b>	<b>2,24</b>
CPI perishables	Percentage, annual change, end of period	-0,16	16,74	26,03	-6,63	5,84	8,88	8,66	2,49	24,42	.	.
CPI processed	Percentage, annual change, end of period	-0,24	2,54	9,62	10,74	-0,91	-0,08	5,04	5,43	15,32	.	.
<b>Core inflation indicators <sup>e/</sup></b>												
CPI excluding food	Percentage, annual change, end of period	2,46	3,28	5,25	5,51	5,03	3,51	3,45	1,03	3,44	.	.
Core 15 CPI	Percentage, annual change, end of period	2,47	3,19	5,59	5,98	4,21	3,22	3,78	1,88	4,42	.	.
CPI excluding food and regulated items	Percentage, annual change, end of period	2,73	2,82	5,50	5,48	4,67	2,57	3,10	1,11	2,49	<b>7,55</b>	<b>6,06</b>
Average of all core inflation indicators	Percentage, annual change, end of period	2,55	3,10	5,44	5,66	4,64	3,10	3,44	1,34	3,45	.	.
MER	Pesos per dollar, average for period	1,869	2,001	2,742	3,055	2,951	2,956	3,281	3,693	3,744	.	.
Inflation gap in the real interest rate	Percentage, average for period	-1,0	-0,3	9,5	2,5	-1,8	-0,8	3,6	6,0	2,6	<b>4,1</b>	<b>0,5</b>
<b>Economic activity</b>												
Gross domestic product	Percentage, annual change, SACE	5,1	4,5	3,0	2,1	1,4	2,6	3,2	-7,0	10,7	<b>6,9</b>	<b>1,1</b>
Final consumption spending	Percentage, annual change, SACE	5,4	4,3	3,4	1,6	2,3	4,0	4,3	-4,2	13,9	.	.
Final household consumption spending	Percentage, annual change, SACE	4,6	4,2	3,1	1,6	2,1	3,2	4,1	-5,0	14,8	.	.
Final government spending	Percentage, annual change, SACE	8,9	4,7	4,9	1,8	3,6	7,4	5,3	-0,6	10,3	.	.
Gross capital formation	Percentage, annual change, SACE	7,8	12,0	-1,2	-0,2	-3,2	1,5	3,0	-20,5	12,2	.	.
Gross fixed capital formation	Percentage, annual change, SACE	8,5	9,2	2,8	-2,9	1,9	1,0	2,2	-23,3	11,2	.	.
Housing	Percentage, annual change, SACE	6,4	10,4	9,5	-0,2	-1,9	-0,4	-8,9	-30,3	22,6	.	.
Other buildings and structures	Percentage, annual change, SACE	12,3	9,6	10,2	0,0	4,6	-3,5	1,1	-30,9	-3,0	.	.
Machinery and equipment	Percentage, annual change, SACE	4,8	9,2	-9,3	-7,9	1,4	8,6	12,3	-13,4	19,1	.	.
Cultivated biological resources	Percentage, annual change, SACE	6,6	-1,3	2,3	13,1	0,3	-3,1	7,9	-1,8	3,7	.	.
Intellectual property products	Percentage, annual change, SACE	19,6	5,1	1,3	-12,0	1,2	1,5	-0,7	-10,8	10,3	.	.
Domestic demand	Percentage, annual change, SACE	5,9	6,0	2,4	1,2	1,1	3,5	4,0	-7,5	13,6	.	.
Exports	Percentage, annual change, SACE	4,7	-0,3	1,7	-0,2	2,6	0,6	3,1	-22,7	14,8	.	.
Imports	Percentage, annual change, SACE	8,5	7,8	-1,1	-3,5	1,0	5,8	7,3	-20,5	28,7	.	.
Output gap <sup>f/</sup>	Percentage	0,8	1,3	1,0	0,4	-0,6	-0,3	0,5	-6,7	-0,9	<b>1,5</b>	<b>0,0</b>
<b>Short-term indicators</b>												
Real industrial production	Percentage, annual change, seasonally adjusted	-1,3	1,7	2,1	3,5	0,0	2,9	1,3	-8,0	15,9	.	.
Retail commerce sales excluding fuels and vehicles	Percentage, annual change, seasonally adjusted	4,6	8,4	6,4	2,0	-0,2	5,4	8,1	-1,7	11,9	.	.
Coffee production	Percentage, annual change in cumulative production for the period	40,6	11,5	16,8	0,4	-0,3	-4,5	8,8	-5,8	-9,5	.	.
Oil production	Percentage, annual change, average for period	6,6	-1,9	1,6	-11,7	-3,7	1,4	2,4	-11,8	-5,8	.	.
<b>Labor Market <sup>g/</sup></b>												
<b>National Total</b>												
Unemployment rate	Percentage, seasonally adjusted, average for period	10,1	9,5	9,3	9,5	9,6	9,9	10,7	16,2	13,8	<b>10,8</b>	.
Employment rate	Percentage, seasonally adjusted, average for period	58,4	58,7	59,2	58,8	58,6	58,1	57,0	50,0	53,10	.	.
Overall participation rate	Percentage, seasonally adjusted, average for period	64,9	64,9	65,3	65,0	64,9	64,5	63,8	59,7	61,50	.	.
<b>Thirteen cities and metropolitan areas</b>												
Unemployment rate	Percentage, seasonally adjusted, average for period	10,9	10,2	10,0	10,2	10,8	10,9	11,3	18,4	15,2	<b>11,1</b>	.
Employment rate	Percentage, seasonally adjusted, average for period	59,8	60,6	60,8	60,2	59,3	58,8	58,2	50,6	53,80	.	.
Overall participation rate	Percentage, seasonally adjusted, average for period	67,2	67,5	67,5	67,0	66,5	66,0	65,6	62,0	63,50	.	.
<b>Balance of payments <sup>h/i/</sup></b>												
Current account (A+B+C)	Millions of dollars	-12,365	-19,819	-18,702	-12,587	-9,924	-14,041	-14,808	-9,258	-17,892	<b>-17,780</b>	<b>-15,134</b>
Percentage of GDP	Percentage, nominal terms	-3,2	-5,2	-6,4	-4,5	-3,2	-4,2	-4,6	-3,4	-7,4	<b>-5,1</b>	<b>-4,1</b>
A. Goods and Services	Millions of dollars	-3,250	-12,332	-19,004	-13,451	-8,762	-10,556	-14,146	-13,089	-20,308	<b>-13,040</b>	<b>-10,821</b>
B. Primary income (factor income)	Millions of dollars	-14,002	-12,108	-5,450	-5,312	-8,046	-11,442	-9,717	-4,957	-8,358	<b>-16,074</b>	<b>-14,756</b>
C. Secondary income (current account transfers)	Millions of dollars	4,887	4,622	5,752	6,177	6,883	7,957	9,055	8,788	10,775	<b>11,334</b>	<b>10,443</b>
Financial account (A+B+C+D)	Millions of dollars	-11,740	-19,292	-18,060	-12,339	-9,625	-12,954	-13,298	-8,161	-16,418	.	.
Percentage of GDP	Percentage, nominal terms	-3,1	-5,1	-6,2	-4,4	-3,1	-3,9	-4,1	-3,0	-6,80	.	.
A. Foreign investment (i+ii)	Millions of dollars	-8,558	-12,270	-7,403	-9,341	-10,011	-6,172	-10,836	-5,773	-6,148	.	.
i. Foreign in Colombia (FDI)	Millions of dollars	16,210	16,169	11,621	13,858	13,701	11,299	13,989	7,459	9,310	.	.
ii. Colombian abroad	Millions of dollars	7,652	3,899	4,218	4,517	3,690	5,126	3,153	1,686	3,162	.	.
B. Portfolio investment	Millions of dollars	-7,438	-11,565	-9,091	-4,945	-1,800	862	24	-1,792	-4,630	.	.
C. Other investment (loans and other credits and derivatives)	Millions of dollars	-2,690	106	-1,981	1,781	1,641	-8,831	-5,820	-4,925	-6,293	.	.
D. Reserve assets	Millions of dollars	6,946	4,437	415	165	545	1,187	3,333	4,328	654	.	.
Errors and omissions (E and O)	Millions of dollars	626	526	642	247	299	1,087	1,509	1,097	1,474	.	.
<b>Interest rates</b>												
Policy rate <sup>j/</sup>	Percentage, average for period	3,43	3,88	4,67	7,10	6,10	4,35	4,25	2,87	1,92	.	.
Policy rate expected by analysts <sup>k/</sup>	Percentage, average for period	.	.	.	.	.	.	.	.	.	<b>6,71</b>	<b>8,52</b>
BBI	Percentage, average for period	3,4	3,8	4,7	7,1	6,1	4,3	4,3	2,9	1,9	.	.
Commercial interest rate <sup>l/</sup>	Percentage, average for period	8,7	8,7	9,4	12,8	11,1	9,3	8,8	7,4	6,2	.	.
Consumer interest rate <sup>m/</sup>	Percentage, average for period	17,9	17,3	17,2	19,2	19,4	17,9	16,5	15,0	14,3	.	.
Mortgage rate <sup>n/</sup>	Percentage, average for period	11,1	11,1	11,0	12,4	11,6	10,6	10,4	10,1	9,1	.	.

SACE: Seasonally adjusted and corrected for calendar effects.

Note: Values in bold represent a projection or assumption.

a/ Quarterly data in bold correspond to an assumption based on the annual projection of each variable.

b/ Calculated for the largest trade partners (excluding Venezuela) by non-traditional dollar exports from Colombia.

c/ Calculations by Banco de la República; excludes the division of the CPI for food and non-alcoholic drinks. See González, E.; Hernández, R.; Caicedo, E.; Martínez-Cortés, N.; Grajales, A.; Romero, J. (2020). "Nueva clasificación del Banrep de la canasta del IPC and 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 division of the CPI for food and non-alcoholic drinks produced by DANE (does not include sub-categories corresponding to food away from home). See 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>.

e/ Calculations by Banco de la República. See 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>.

f/ The historical estimate for the gap is calculated as the difference between observed and potential (trend) GDP resulting from the 4G monetary policy model; forecast is calculated as the difference between the technical staff's GDP estimate and potential (trend) GDP from the 4G model.

g/ Rates are calculated based on seasonally adjusted annual populations. Provisional chain-linking is used, calculated by Banco de la República's technical staff, that considers the dynamic observed in the previous survey (GEIH Framework 2005), growth factors in the national census from 2018, and changes in the definition of the working-age population. It is important to note that this chain-linking does not control for potential changes introduced in the new survey as a result of updates to the geostatistical framework and, consequently, is an approximation of the dynamics that could be observed in labor market statistics within the new framework. Chain-linked figures can include some margin of error, especially for periods in which large population changes are observed, as was the case during the pandemic.

h/ The results presented herein follow the recommendations of the sixth balance of payments manual proposed by the International Monetary Fund (IMF). See additional information and methodological changes at: <http://www.banrep.gov.co/balanza-pagos>.

i/ Results for 2020 and 2021 are preliminary.

j/ Corresponds to the annually average monetary policy rate calculated with the working days of the series.

k/ These projections are calculated as the average rate that would be active in each year according to the median of the analyst response to the Central Bank's monthly economic analyst survey from July 2022.

l/ Weighted average by rate amounts for ordinary, treasury, and preferential credit.

m/ Excludes credits granted through credit cards.

n/ Weighted average per interest rate amounts for disbursements in pesos and UVR for non-low-income housing credit.

## Annex 2 (continued)

# Main macroeconomic forecast variables

		2017				2018			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
<b>Exogenous variables</b>									
<b>External <sup>a/</sup></b>									
Trade partners GDP <sup>b/</sup>	Percentage, annual change, seasonally adjusted	2.4	3.4	3.1	2.9	2.4	3.4	1.0	0.9
Oil price (Benchmark Brent)	Dollars per barrel, average for period	55	51	52	61	67	75	76	69
Federal funds (Fed) effective interest rate	Percentage, average for period	0.70	0.95	1.16	1.20	1.45	1.74	1.92	2.22
Credit default swaps at 5 years for Colombia	Basis points, average for period	144	130	127	113	99	113	110	132
<b>Domestic</b>									
Colombia real neutral interest rate	Percentage, average for period								
Potential (trend) GDP	Percentage, annual change								
<b>Endogenous variables</b>									
<b>Prices</b>									
CPI Total	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 <sup>c/</sup>	Percentage, annual change, end of period	5.55	5.40	4.86	5.03	3.97	3.73	3.67	3.51
CPI tradable (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 non-tradable (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 regulated items	Percentage, annual change, end of period	4.71	6.33	6.10	6.26	6.28	6.21	6.35	6.65
CPI food <sup>d/</sup>	Percentage, annual change, end of period	1.46	-1.21	0.59	0.48	-0.06	1.11	1.47	1.87
CPI perishables	Percentage, annual change, end of period	-13.09	-14.72	-0.32	5.84	7.13	8.47	9.51	8.88
CPI processed	Percentage, annual change, end of period	6.28	3.29	0.84	-0.91	-2.01	-0.91	-0.72	-0.08
<b>Core inflation indicators <sup>e/</sup></b>									
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 15 CPI	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
MER	Pesos per dollar, average for period	2,923	2,919	2,977	2,987	2,860	2,841	2,961	3,164
Inflation gap in the real interest rate	Percentage, average for period	-2.9	-3.2	-0.7	-0.2	-3.4	-3.8	-0.4	4.5
<b>Economic activity</b>									
Gross domestic product (SACE)	Percentage, annual change, SACE	0.8	1.7	1.6	1.4	2.1	2.4	2.9	2.9
Final consumption spending	Percentage, annual change, SACE	2.2	2.3	2.6	2.3	3.8	4.1	4.0	4.0
Final household consumption spending	Percentage, annual change, SACE	1.8	2.3	2.4	1.7	3.3	3.5	3.3	2.9
Final government spending	Percentage, annual change, SACE	4.0	2.2	3.6	4.8	6.6	7.0	7.9	7.9
Gross capital formation	Percentage, annual change, SACE	-0.4	-1.9	-4.5	-6.1	-6.3	1.2	0.3	11.4
Gross fixed capital formation	Percentage, annual change, SACE	-1.0	1.6	5.9	1.1	-1.7	2.3	1.5	2.0
Housing	Percentage, annual change, SACE	12.7	-0.6	-4.4	-13.2	-8.8	-1.6	6.2	3.6
Other buildings and structures	Percentage, annual change, SACE	-3.7	5.7	11.2	5.4	-6.3	-1.3	-5.5	-0.9
Machinery and equipment	Percentage, annual change, SACE	-5.9	-2.0	7.5	6.2	11.7	13.3	6.8	3.6
Cultivated biological resources	Percentage, annual change, SACE	22.0	-1.8	-10.8	-4.8	-11.1	-6.3	3.4	2.5
Intellectual property products	Percentage, annual change, SACE	-5.1	2.3	4.6	3.5	2.7	2.4	0.7	0.3
Domestic demand	Percentage, annual change, SACE	1.0	1.4	1.3	0.7	1.6	3.7	3.5	5.1
Exports	Percentage, annual change, SACE	1.3	5.6	3.5	0.1	0.2	-2.1	1.6	2.9
Imports	Percentage, annual change, SACE	3.8	1.8	1.0	-2.5	-1.7	4.6	5.3	15.4
Output gap <sup>h/</sup>	Percentage	0.0	-0.2	-0.3	-0.6	-0.6	-0.6	-0.4	-0.3
<b>Short-term indicators</b>									
Real industrial production	Percentage, annual change, seasonally adjusted	-0.6	-0.5	1.1	0.2	2.4	2.7	3.7	2.8
Retail commerce sales excluding fuels and vehicles	Percentage, annual change, seasonally adjusted	0.0	-0.3	0.4	-0.7	4.5	6.2	4.9	6.1
Coffee production	Percentage, annual change in cumulative production for the period	13.0	-17.2	17.1	-10.1	-5.8	13.1	-13.8	-6.6
Oil production	Percentage, annual change, average for period	-11.6	-5.2	1.5	1.9	0.7	1.2	1.1	2.6
<b>Labor Market <sup>i/</sup></b>									
<b>National Total</b>									
Unemployment rate	Percentage, seasonally adjusted, average for period	9.5	9.4	9.7	9.8	9.6	9.7	9.7	10.4
Employment rate	Percentage, seasonally adjusted, average for period	58.7	59.1	58.6	58.3	58.1	58.4	58.5	57.4
Overall participation rate	Percentage, seasonally adjusted, average for period	64.9	65.2	64.9	64.6	64.2	64.7	64.8	64.1
<b>Thirteen cities and metropolitan areas</b>									
Unemployment rate	Percentage, seasonally adjusted, average for period	10.6	10.9	11.2	10.7	10.8	10.8	10.6	11.4
Employment rate	Percentage, seasonally adjusted, average for period	59.7	59.5	59.1	58.9	58.8	59.0	59.2	58.1
Overall participation rate	Percentage, seasonally adjusted, average for period	66.8	66.8	66.5	65.9	65.9	66.1	66.2	65.5
<b>Balance of payments <sup>n/</sup></b>									
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 account 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 (i+ii)	Millions of dollars	-1,743	-1,217	-4,112	-2,939	-910	-2,273	-2,375	-615
i. Foreign 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 and 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 and O)	Millions of dollars	503	-199	181	-186	146	752	-81	270
<b>Interest rates</b>									
Policy rate <sup>j/</sup>	Percentage, average for period	7.38	6.56	5.48	4.99	4.58	4.33	4.25	4.25
Policy rate expected by analysts <sup>k/</sup>	Percentage, average for period								
BBI	Percentage, average for period	7.4	6.6	5.5	5.0	4.6	4.3	4.3	4.3
Commercial interest rate <sup>l/</sup>	Percentage, average for period	12.8	11.6	10.6	10.0	9.4	9.4	9.3	9.0
Consumer interest rate <sup>m/</sup>	Percentage, average for period	20.1	19.7	19.0	18.7	18.7	17.9	18.0	17.3
Mortgage rate <sup>n/</sup>	Percentage, average for period	12.5	12.3	11.3	10.9	10.8	10.6	10.5	10.4

SACE: Seasonally adjusted and corrected for calendar effects.

Note: Values in bold represent a projection or assumption.

a/ Quarterly data in bold correspond to an assumption based on the annual projection of each variable.

b/ Calculated for the largest trade partners (excluding Venezuela) by non-traditional dollar exports from Colombia.

c/ Calculations by *Banco de la República*; excludes the division of the CPI for food and non-alcoholic drinks. See González, E.; Hernández, R.; Caicedo, E.; Martínez-Cortés, N.; Grajales, A.; Romero, J. (2020). "Nueva clasificación del Banrep de la canasta del IPC and 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 division of the CPI for food and non-alcoholic drinks produced by DANE (does not include sub-categories corresponding to food away from home). See 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>.

e/ Calculations by *Banco de la República*. See 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>.

f/ The historical estimate for the gap is calculated as the difference between observed and potential (trend) GDP resulting from the 4G monetary policy model; forecast is calculated as the difference between the technical staff's GDP estimate and potential (trend) GDP from the 4G model.

g/ Rates are calculated based on seasonally adjusted annual populations. Provisional chain-linking is used, calculated by *Banco de la República's* technical staff, that considers the dynamic observed in the previous survey (GEIH Framework 2005), growth factors in the national census from 2018, and changes in the definition of the working-age population. It is important to note that this chain-linking does not control for potential changes introduced in the new survey as a result of updates to the geostatistical framework and, consequently, is an approximation of the dynamics that could be observed in labor market statistics within the new framework. Chain-linked figures can include some margin of error, especially for periods in which large population changes are observed, as was the case during the pandemic.

h/ The results presented herein follow the recommendations of the sixth balance of payments manual proposed by the International Monetary Fund (IMF). See additional information and methodological changes at: <http://www.banrep.gov.co/balanza-pagos>.

i/ Results for 2020 and 2021 are preliminary.

j/ Corresponds to the annually average monetary policy rate calculated with the working days of the series.

k/ These projections are calculated as the average rate that would be active in each year according to the median of the analyst response to the Central Bank's monthly economic analyst survey from July 2022.

l/ Weighted average by rate amounts for ordinary, treasury, and preferential credit.

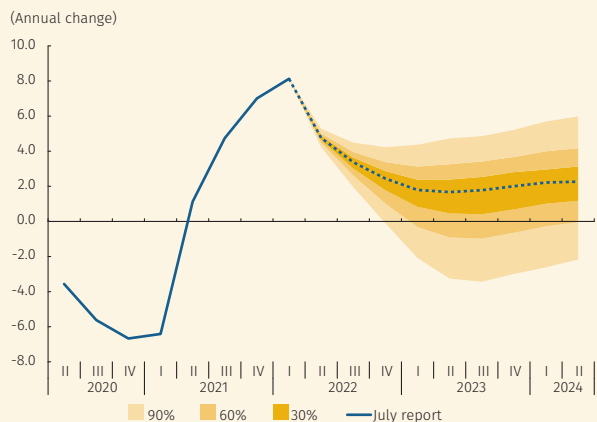
m/ Excludes credits granted through credit cards.

n/ Weighted average per interest rate amounts for disbursements in pesos and UVR for non-low-income housing credit.

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
1.1	3.1	1.5	-2.1	-7.3	-44.4	50.5	12.4	5.7	5.2	6.2	3.3	1.7	-0.5	2.4	1.8	2.2	2.2	2.3	2.3	2.4	2.4
64	68	62	62	51	33	43	45	61	69	73	80	98	112	104	100	96	92	89	87	85	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	0.77	2.20	3.24	3.63	3.63	3.63	3.63	3.46	3.22
121	104	90	83	125	206	132	104	110	131	143	185	209	238	300	280	266	251	235	222	212	206
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	9.99	9.69	8.24	7.06	6.21	5.67	4.62	3.94
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	.	.	.	.	.	.	.	.
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	.	.	.	.	.	.	.	.
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	.	.	.	.	.	.	.	.
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	10.20	10.32	10.17	8.98	8.16	7.21	5.85	4.91
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	21.83	16.94	10.15	6.47	4.00	2.24	1.22	0.76
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	.	.	.	.	.	.	.	.
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	.	.	.	.	.	.	.	.
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	.	.	.	.	.	.	.	.
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	.	.	.	.	.	.	.	.
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	6.85	7.55	7.30	6.76	6.34	6.06	5.07	4.41
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	.	.	.	.	.	.	.	.
3.134	3.241	3.340	3.411	3.532	3.848	3.733	3.661	3.555	3.696	3.847	3.880	3.915	3.915	.	.	.	.	.	.	.	.
2.3	3.4	4.1	4.8	5.0	10.9	5.8	2.4	-0.7	3.0	4.4	3.7	2.7	1.6	8.6	3.4	1.4	0.4	0.4	-0.3	-0.2	-0.5
3.1	3.4	3.3	3.0	0.7	-16.5	-8.7	-3.6	1.2	18.2	13.9	10.8	8.2	11.5	5.7	2.6	1.4	0.6	0.5	1.8	2.5	2.6
3.2	4.3	4.5	5.1	4.2	-12.7	-7.7	-0.3	2.7	23.2	19.3	12.2	11.7	10.3	.	.	.	.	.	.	.	.
2.5	3.8	4.5	5.4	4.9	-15.2	-8.9	-0.5	2.1	25.7	20.5	13.3	12.0	11.9	.	.	.	.	.	.	.	.
6.5	5.7	4.9	4.1	-0.1	-1.5	-1.7	0.8	7.6	12.2	13.7	7.9	8.6	5.8	.	.	.	.	.	.	.	.
9.3	3.2	5.2	-5.1	-12.4	-35.6	-16.6	-17.3	-2.8	30.2	8.1	18.5	18.3	15.0	.	.	.	.	.	.	.	.
7.2	4.1	1.5	-3.4	-10.9	-39.9	-24.4	-17.4	-4.6	35.1	11.5	9.9	8.1	11.5	.	.	.	.	.	.	.	.
-5.4	-9.9	-8.7	-11.5	-20.8	-42.3	-31.2	-27.1	12.7	36.6	19.1	26.0	-2.0	18.5	.	.	.	.	.	.	.	.
13.1	-1.4	0.1	-6.0	-12.5	-47.8	-33.8	-29.3	-20.6	24.0	-4.0	-0.1	-2.7	9.3	.	.	.	.	.	.	.	.
14.2	21.8	9.9	3.5	-4.1	-37.4	-9.5	0.0	6.7	49.9	19.6	9.2	25.6	16.0	.	.	.	.	.	.	.	.
6.2	9.6	14.6	1.7	2.0	0.8	-8.0	-1.6	9.1	5.0	1.0	-0.5	-10.4	-6.8	.	.	.	.	.	.	.	.
-0.5	-1.7	-1.1	0.6	-2.0	-19.4	-13.0	-8.7	-2.9	13.4	16.3	15.8	15.8	21.1	.	.	.	.	.	.	.	.
4.5	3.7	4.9	2.9	0.7	-17.8	-9.5	-3.2	1.6	24.3	17.8	12.8	13.4	12.3	.	.	.	.	.	.	.	.
4.8	9.1	2.1	-3.3	-7.2	-31.7	-28.4	-23.3	-10.6	15.7	25.6	35.6	16.7	19.1	.	.	.	.	.	.	.	.
11.7	8.8	11.0	-1.2	-6.2	-33.8	-25.7	-15.9	-2.5	46.9	41.9	36.9	38.6	23.9	.	.	.	.	.	.	.	.
-0.1	0.2	0.4	0.5	0.0	-3.4	-5.6	-6.7	-6.7	-4.3	-2.3	-0.9	-0.1	1.0	1.6	1.5	1.1	0.7	0.2	0.0	0.0	0.0
1.1	2.4	0.7	1.0	-1.4	-23.4	-7.1	0.1	6.6	27.4	19.7	12.6	11.8	.	.	.	.	.	.	.	.	.
6.5	7.2	9.5	9.2	6.2	-14.8	-3.3	5.2	4.6	19.0	15.3	10.3	11.7	.	.	.	.	.	.	.	.	.
-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	.	.	.	.	.	.	.	.
5.3	3.2	1.4	-0.2	-2.1	-15.7	-15.4	-14.1	-14.6	-5.1	-0.1	-1.7	-0.2	.	.	.	.	.	.	.	.	.
10.7	10.4	11.0	10.8	11.6	20.7	17.8	15.2	14.7	15.2	12.6	12.7	12.0	10.7	10.4	10.2	.	.	.	.	.	.
57.5	57.0	56.6	56.8	55.1	44.1	48.8	52.2	52.7	52	53.6	53.9	55.9	.	.	.	.	.	.	.	.	.
64.3	63.6	63.6	63.7	62.3	55.6	59.4	61.6	61.8	61.3	61.4	61.7	63.5	.	.	.	.	.	.	.	.	.
11.4	11.2	11.1	11.4	11.4	24.6	21.3	16.9	16.7	16.8	14.1	13.2	12.1	11.1	10.6	10.4	.	.	.	.	.	.
58.2	58.2	58.2	58.2	56.7	43.9	48.7	53.1	53.5	53.1	54.3	54.4	57.6	.	.	.	.	.	.	.	.	.
65.7	65.6	65.4	65.7	64	58.2	61.9	63.9	64.2	63.8	63.2	62.6	65.5	.	.	.	.	.	.	.	.	.
-3,821	-3,218	-4,302	-3,466	-2,302	-1,961	-2,012	-2,983	-3,085	-4,069	-4,850	-5,887	-5,367	.	.	.	.	.	.	.	.	.
-4.8	-4.1	-5.3	-4.1	-3.1	-3.6	-3.0	-3.9	-4.1	-5.6	-6.1	-6.8	-6.4	.	.	.	.	.	.	.	.	.
-3,137	-2,997	-4,405	-3,606	-3,098	-2,651	-3,262	-4,078	-3,759	-5,102	-5,318	-6,129	-5,058	.	.	.	.	.	.	.	.	.
-2,616	-2,502	-2,301	-2,298	-1,376	-1,028	-1,172	-1,380	-1,776	-1,594	-2,295	-2,693	-3,506	.	.	.	.	.	.	.	.	.
1,932	2,281	2,404	2,438	2,173	1,718	2,422	2,475	2,450	2,627	2,763	2,935	3,197	.	.	.	.	.	.	.	.	.
-3,520	-3,333	-3,740	-2,706	-1,751	-1,948	-1,868	-2,595	-2,430	-3,775	-4,749	-5,464	-4,718	.	.	.	.	.	.	.	.	.
-4.4	-4.2	-4.6	-3.2	-2.4	-3.5	-2.8	-3.4	-3.2	-5.2	-6.0	-6.3	-5.7	.	.	.	.	.	.	.	.	.
-2,652	-3,626	-1,678	-2,880	-1,939	-1,736	-2,69	-1,829	-1,485	-1,048	-2,588	-1,027	-3,844	.	.	.	.	.	.	.	.	.
3,394	4,090	3,163	3,342	3,175	1,371	844	2,069	2,353	2,032	2,758	2,166	5,186	.	.	.	.	.	.	.	.	.
741	465	1,485	462	1,236	-365	575	240	869	984	170	1,139	1,342	.	.	.	.	.	.	.	.	.
-1,382	-282	137	1,551	-168	-3,429	323	1,482	1,319	-6,089	826	-685	1,797	.	.	.	.	.	.	.	.	.
-1,836	48	-2,453	-1,579	526	628	-2,126	-3,952	-2,455	3,189	-3,141	-3,886	-2,798	.	.	.	.	.	.	.	.	.
2,351	526	254	202	-171	2,590	205	1,705	190	174	154	135	127	.	.	.	.	.	.	.	.	.
301	-115	562	760	551	13	144	389	654	295	101	423	649	.	.	.	.	.	.	.	.	.
4.25	4.25	4.25	4.25	4.23	3.26	2.24	1.75	1.75	1.75	1.75	2.41	3.69	5.68	8.50	9.00	9.00	9.00	8.33	7.75	7.17	6.50
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	5.0	.	.	.	.	.	.	.	.
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	.	.	.	.	.	.	.	.
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	.	.	.	.	.	.	.	.
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	.	.	.	.	.	.	.	.

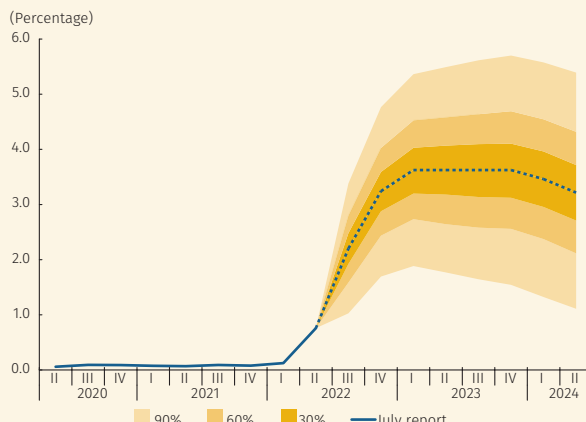
# Annex 3 Predictive densities for other relevant macroeconomic variables

**Graph A3.1**  
Supposed quarterly trade partner 12-month growth based on annual projections, predictive density <sup>a/</sup>



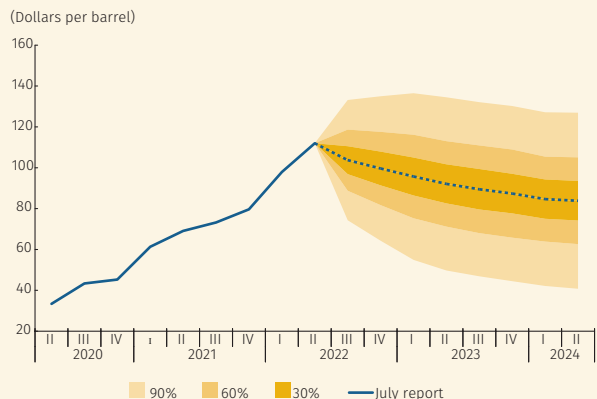
a/ The graph displays the probability distribution and its most likely trajectory on an eight-quarter forecast horizon. Densities characterize the balance of potential risks with areas of 30%, 60% and 90% probability around the central forecast (mode).  
Sources: Bloomberg, statistics offices, central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

**Graph A3.3**  
Supposed U.S. Federal Reserve quarterly interest rate, predictive density <sup>a/</sup>



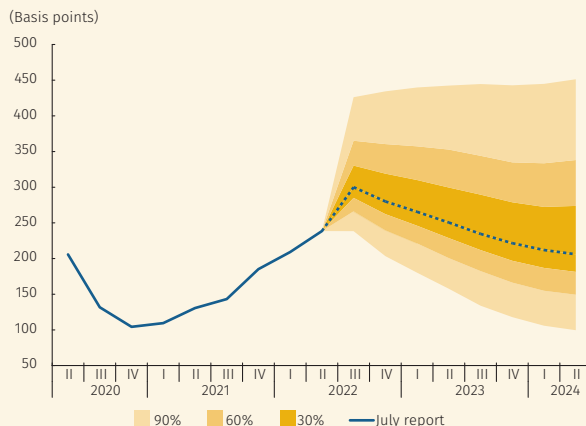
a/ The graph displays the probability distribution and its most likely trajectory on an eight-quarter forecast horizon. Densities characterize the balance of potential risks with areas of 30%, 60% and 90% probability around the central forecast (mode).  
Sources: Federal Reserve Bank of St. Louis, calculations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

**Graph A3.2**  
Supposed quarterly oil price, predictive density <sup>a/</sup>



a/ The graph displays the probability distribution and its most likely trajectory 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).  
Sources: Bloomberg, calculations and projections by Banco de la República.

**Graph A3.4**  
Supposed quarterly risk premium for Colombia (CDS), predictive density <sup>a/,b/</sup>



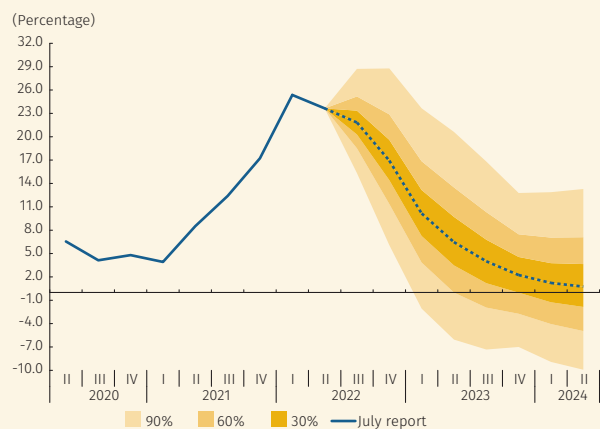
a/ Five-year credit default swaps.  
b/ The graph displays the probability distribution and its most likely trajectory on an eight-quarter forecast horizon. Densities characterize the balance of potential risks with areas of 30%, 60% and 90% probability around the central forecast (mode), using a combination of densities from the Patacon and 4GM models.  
Sources: Bloomberg, calculations and projections by Banco de la República.



## Annex 3 (continued)

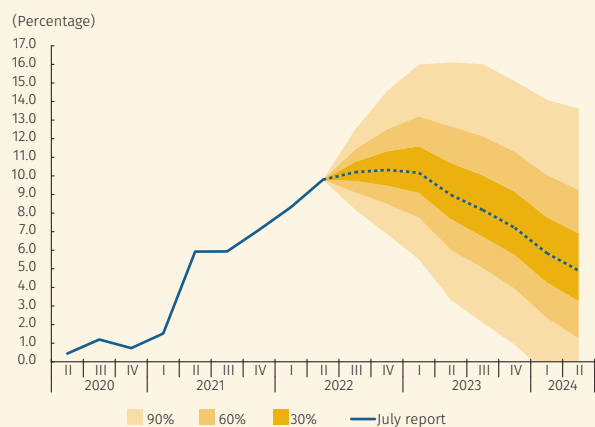
### Predictive densities for other relevant macroeconomic variables

Graph A3.5  
CPI for foods, predictive density <sup>a/</sup>  
(Annual change; end-of-period)



a/ The graph displays the probability distribution and its most likely trajectory 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. Sources: DANE, calculations and projections by Banco de la República.

Graph A3.6  
CPI for regulated items, predictive density <sup>a/</sup>  
(Annual change; end-of-period)



a/ The graph displays the probability distribution and its most likely trajectory 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. Sources: DANE, calculations and projections by Banco de la República.