FMR

Financial Markets Report

Second Quarter 2023

FINANCIAL MARKETS REPORT

Second Quarter 2023

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Financial Markets Report - Second Quarter 2023

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Contents

1. Introduction 6
2. Executive Summary 8
  2.1. International Environment 8
  2.2. Risk Perception at the Local Level 8
  2.3. Fixed-Income and Money Markets 8
  2.4. Foreign Exchange Market 9
  2.5. Stock Market 10
3. International Environment 11
4. Risk Perception at the Local Level 22
5. Fixed-Income and Money Markets 28
  5.1. Monetary Policy and Inflation in Latin America 28
  5.2. Colombian Money Market 32
  5.3. Domestic and Foreign Public Debt Market 34
  5.4. Private Debt Market 43
6. Foreign Exchange Market 45
  6.1. Global Foreign Exchange Market 45
  6.2. Colombian Foreign Exchange Market 51
7. Stock Market 55
8. Boxes 61
  Box 1: Factors that may influence the Resistance to Inversion of the Yield Curve in Colombia 61
  Box 2: Central Bank Asset Purchases in Response to the Covid-19 Crisis 71

Graphs

Graph 1. Inflation in Developed Economies 11
Graph 2. Inflation Expectations in the Swaps Market 12
Graph 3. Unemployment Rate in Developed Economies 13
Graph 4. Consumer Confidence in Developed Economies 13
Graph 5. Growth Forecast 14
Graph 6. Implied Path of U.S. Monetary Policy (Futures Market) 15
Graph 7. Five-Year OIS Rates 16
Graph 8. International Risk Perception Indicators 17
Graph 9. Financial Conditions Index 18
Graph 10. Foreign Portfolio Investment Flows to Emerging Economies 19
Graph 11. Change in Prices of Energy-Generating Products 20
Graph 12. Oil Price Forecasts (Annual Average Spot Price) 21
Graph 13. Change in Commodity Prices 21
Graph 14. Five-Year CDS in Latin America 23
Graph 15. Latin America Sovereign Debt Spreads (EMBI+) 24
Graph 16. Confidence Indicators 25
Graph 17. Growth Forecast 26
Graph 18. Inflation Expectations 26
Graph 19. Most Relevant Factors when Making Investment Decisions 27
Graph 20. Monetary Policy Rates in Latin American countries 28
Graph 21. Inflation in the Countries of the Region 30
Graph 22. Market-Implied MPR Expectations 31
Graph 23. One-Year Market-Implied Inflation Expectations 31
Graph 24. 1-Year, 5-Year, and 10-Year Implied Inflation Expectations in the Public Debt Market 32
Graph 25. *Banco de la República’s* Benchmark Rate, TIB, and O/N IBR 33
Graph 26. National Account Balance at *Banrep* and Spread between O/N IBR and MPR 34
Graph 27. Regional and U.S. 2-Year Zero-Coupon Rates 35
Graph 28. Regional and U.S. 5-Year Zero-Coupon Rates 36
Graph 29. Regional and U.S. 10-Year Zero-Coupon Rates 36

Graph 30. TES Zero-Coupon Rate in Pesos and *Banrep's* Benchmark Rate....................................37
Graph 31. Spot Curve in Pesos, Colombia....................................38
Graph 32. Spot Curve in UVR, Colombia....................................38
Graph 33. Cumulative Flows in 2023 by Type of Foreign Investor in the TES Spot Market (billions)....................................40
Graph 34. Cumulative Net Purchases per Year of Pension and Severance Funds (FPCs) in the TES Spot Market (billions)....................................41
Graph 35. Treasury Spread - 10-Year Global Bonds....................................42
Graph 36. Composition by Rate and Currency of the Central National Government Debt....................................42
Graph 37. Maturity Profile of the Central National Government Debt....................................43
Graph 38. Spread between CDT and TES Rates....................................44
Graph 39. Amounts Placed in Dematerialized CDTs by Type of Rate....................................44
Graph 40. VIX and an Index to Track Emerging Currency Dynamics....................................46
Graph 41. Latin America and U.S. Dollar Exchange Rates....................................48
Graph 42. Conditional Volatility of Latin American Exchange Rates....................................48
Graph 43. Foreign Exchange Market Liquidity Measures....................................52
Graph 44. Exchange Rate Derivatives Cleared at the CRCC....................................53
Graph 45. Net Purchase Balances of Peso-Dollar Forwards and Swaps....................................54
Graph 46. Implied (Observed), Theoretical One-Month Devaluation and its Difference....................................55
Graph 47. Evolution of Stock Indexes Worldwide....................................56
Graph 48. Evolution of the Region's Stock Indexes....................................57
Graph 49. MSCI COLCAP and Daily Traded Volume....................................58
Graph 50. Net Purchases in the Local Equity Market by Type of Agent....................................59
Graph 51. Conditional Volatility of Stock Indexes....................................60

List of Tables

Table 1. Summary of Financial Markets During 2Q23 7

Table 2. Inflation Last Two Quarters and Inflation Target 2023 29

Table 3. Currency Depreciation against the U.S. Dollar 45

Table 4. BCB's Foreign Exchange Intervention (net purchases including maturities) 49

Table 5. Central Bank of Perú's foreign exchange intervention (net purchases including maturities) 50

Table 6. BCCh's Foreign Exchange Intervention (net purchases including maturities) 51

Table 7 . Average Performance of Stock Indexes by Sector (2Q23) 57

Table 8. Experience of some Central Banks 75

1. Introduction

Banco de la República (the Central Bank of Colombia, *Banrep*) generates information for decision-making, accountability, and public dissemination. In particular, the *Financial Markets Report* is framed within the principle of public dissemination and contributes to *Banrep's* service of providing quality economic information and research.

In line with the above, this Report seeks to provide the public with a general analysis of the behavior and trends of domestic and international financial markets for the second quarter of 2023. Additionally, it points out the main factors that explain these markets' behavior and their interactions, as well as a description of the main changes in monetary policy and central bank decisions worldwide.

The global economic environment in which the markets studied in this Report operate continues to be immersed in a context of high inflationary pressures and uncertainty regarding central banks' actions to fight this dynamic. However, during the second quarter of 2023, consumer price indexes continued showing a downward trend in most countries, mainly due to lower supply pressures. In turn, the economic indicators have surprised with an upward trend, leading to a higher growth expectation for 2023 and a reduction in the forecast for 2024 in most countries. In this context, the main central banks of developed economies continued with their cycle of interest rate hikes, the markets continued to discount further increases for the rest of the year and, as a result, government bonds prices declined in these economies. Furthermore, some riskier assets, including equities, performed favorably due to a reactivation of risk appetite, which was affected by adverse events in the regional banking of the United States and Credit Suisse in Europe during the first quarter and, subsequently, by the uncertainty surrounding the debt ceiling negotiations in the United States (See International Environment - Table 1).

Regarding the local public debt market, contrary to 2022, it had a favorable performance, outperforming its regional peers, and it was in line with the market outlook on the end of the cycle of increases in *Banrep's* monetary policy rate and the greater risk appetite at the local level (See Risk Perception at the Local Level - Table 1). Long-term securities outperformed short-term securities, supported by purchases of local institutional agents, who took longer duration. In this context, the yield curve closed the quarter close to a possible inversion due to the significant reduction in the inflation risk premium (see Box 1: Factors that may influence the resistance of the yield curve in Colombia to invert). Meanwhile, foreign investors increased their sales of government bonds in the quarter, which would be associated with some local risk factors, profit taking, and rebalancing given the accumulated valuations of Colombian securities during the year (See Domestic and Foreign Public Debt Market - Table 1).

Concerning the evolution of macroeconomic variables and expectations for future monetary policy in the local context, market agents anticipate a declining inflation path for 2023, which is consistent with *Banrep's* contractionary monetary policy stance outlook. During the quarter, *Banrep* increased its interest rate by 25 bps in April to 13.25% and kept it unchanged in June. In this context, the market does not expect further increases and anticipates the beginning of interest rate reductions during the second half of the year. Although liquidity conditions in the money market have tightened due to high levels of deposits of the Nation in *Banrep*, the instruments to provide liquidity to the economy have allowed the spread between the overnight benchmark interbank rate (IBR) and the monetary policy rate to remain at low levels. Thus, *Banrep* made purchases in the public debt market in order to provide permanent liquidity to the economy (See Fixed-Income and Money Markets - Table 1). *Banrep's* intervention to promote an adequate behavior in the system's liquidity is not a new behavior, as shown in Box 2: Central bank asset purchases in response to the Covid-19 crisis. This Box's main objective is to summarize the findings on the experience of several central banks with asset purchase intervention early in the pandemic.

Regarding the foreign exchange market, the Colombian peso (COP) appreciated above its regional peers and returned to levels not seen since the middle of last year, in line with the greater local risk appetite and flows that influenced its performance. When studying the dynamics of the region's currencies over a longer time frame, it is found that the COP strengthening in the recent period brings it closer to the dynamics of its peers, although a greater accumulated depreciation since 2020 is still evident (See Colombian Foreign Exchange Market - Table 1). Finally, within a low liquidity environment, the local stock market continues to exhibit a weak performance compared to its peers in the region (See Stock Market -Table 1).

Table 1. Summary of Financial Markets During 2Q23

Changes from 31 March 2023 to 30 June 2023

	Policy rate	Local currency rate		Exchange rate	Stock Market	5-year CDS	EMBI+	Commodity
		2 years	10 years					
United Kingdom	75	173	83	3.0%	-1.3%			
Japan	0	-1	6	-8.6%	18.4%			
Germany	50	49	9	0.6%	1.9%	-5.8%		
USA	25	82	30	0.4%	8.3%	-5.1	-25.3	
Colombia	25	-81	-180	10.1%	-2.1%	-52	-19	-6.1%
UVR		53	-87					
Brazil	0	-133	-205	5.5%	15.9%	-52	-23	3.4%
Mexico	0	-38	-17	5.1%	-0.7%	-18	-21	-6.6%
Chile	0	-20	10	-0.9%	8.7%	-32	-21	-8.6%
Perú	0	-63	-58	3.7%	2.0%	-32	-35	-8.6%
Other EM	0	0	-11	-0.9%	-0.1%	-16	-24	-2.1%

Source: Bloomberg, *Banco de la República*.

Positive exchange rate variations show an appreciation of the exchange rate. The U.S. CDS and EMBI+ correspond to the VIX and MOVE, respectively, while the German CDS corresponds to the Vstoxx. Changes in policy rates, local and foreign currency sovereign bond interest rates, five-year CDS, and EMBI are presented in basis points (bps). The "Commodities" category corresponds to Brent Crude Oil in Colombia; WTI in Mexico; copper in Chile and Perú; and soy in Brazil. The "Other EM" category corresponds to Turkey, South Africa, Russia, Indonesia, India, Thailand, China, Malaysia, Poland, and the Czech Republic.

2. Executive Summary

2.1. International Environment

The global economic environment continues to show high inflation, still far from central banks' targets, but continues to have corrections in response to lower supply and demand pressures. This correction has not been as sharp for core inflation measures. Meanwhile, economic activity in most countries has been more resilient than expected in the previous quarter. In this context, most developed economy central banks continued with the cycle of benchmark interest rate increases during the second quarter, and the market expects additional increases for the rest of the year with a higher terminal rate than expected in the previous quarter.

Contrary to the behavior observed during the first quarter of the year and in line with expectations of a more contractionary monetary policy and the greater resilience of economic activity, government bond prices declined in developed economies. However, equity markets maintained their good performance within an environment of increased risk appetite due to the reduced uncertainty regarding regional financial institutions' resilience, the debt ceiling in the United States, and the future of Credit Suisse in Europe. In this scenario, for some economies, the global financial conditions remain tight, while for the United States and Japan there have been slight corrections.

Commodities, which affect the dynamics of countries in different ways according to their dependence on such resources, showed devaluations. In general, commodities were affected by lower-than-expected demand from China and expectations of higher interest rates from most central banks in the main advanced economies.

2.2. Risk Perception at the Local Level

In addition to the higher risk appetite at the global level, the lower risk perception at the local level was also favored both by the expectation that headline inflation peaked in the first quarter of the year and by the favorable perception regarding the strength of local institutions, which have played an important role in the review and discussion of the reforms proposed by the Government. In this regard, Colombia´s CDS outperformed its regional peers during the quarter under analysis. This dynamic was accompanied by the ratification of the investment grade rating of Colombian sovereign debt by Moody's Investors Service. Nevertheless, CDS still shows a high value compared to its regional peers and is exposed to some upward risk factors.

2.3. Fixed-Income and Money Markets

Monetary Policy and Inflation in Latin America

The benchmark rate for Colombia was 13.25%, resulting from the increase of 25 basis points by the Board of Directors of *Banco de la República* in the second quarter of 2023. Most central banks in the region slowed their monetary policy rate (MPR) increases in this period, while financial markets anticipated reductions of the MPR for the second half of 2023.

Colombian Money Market

Locally in the money market, the Overnight Reference Banking Indicator (IBR O/N) was very close to the MPR during the quarter. However, there were some positive differences in some periods, evidencing some liquidity tightening in the money market. In this sense, *Banco de la República* offered repos at different maturities and made purchases in the public debt market to provide permanent liquidity in the economy and prevent the IBR from deviating from the MPR.

Domestic and Foreign Public Debt Market

Public bond prices declined for most developed countries across all maturities during the second quarter of 2023 in response to uncertainty about the future of inflation dynamics and the monetary policy path. Despite the reductions in inflation expectations, the short-term had a greater decline than the long-term due to expectations of future rate increases and the resilience of economic activity, leading to a flattening of the curves for these countries.

In the region, local currency public bond prices increased. This behavior is associated with market expectations of an end of the cycle of MPR increases in the coming months and an improved appetite for risk assets globally. However, it is generally observed that these countries continue to face higher financing costs compared to the levels observed in the years prior to the pandemic.

At the local level, foreign investors increased their pace at which they are selling local currency government bonds. Nevertheless, they remain the second largest holders of these assets, after local pension funds. These managers have made significant purchases of these securities so far this year, partially offsetting the outflows of foreign investors. By type of foreign investor, there was a shift towards agents with a less stable position (e.g., mutual funds), due to greater outflows of international pension funds.

Private Debt Market

During the quarter, the funding costs for banks through certificates of deposit (CDT in Spanish) were on average lower than in the first quarter of the year. This was reflected in a lower average spread between CDT and TES (bonds issued by the Colombian Government) rates.

Additionally, funding through private bond placements has continued with low dynamism and, along with this, no placements were made through the Colombian Stock Exchange (BVC in Spanish) during the second quarter of the year.

2.4. Foreign Exchange Market

The U.S. dollar was volatile and closed with a slight upward variation compared to the end of the previous quarter; thus, continuing at historically high levels. Among the factors that guided its variability were: changes in expectations of the magnitude of monetary tightening by the Federal

Reserve (Fed), which increased compared to the end of the previous quarter, expectations of a more contractionary monetary policy by central banks of other developed economies, and specific events that generated a greater perception of risk at a global level.

The currencies of the emerging countries analyzed had a mixed performance, while the Latin American currencies performed favorably relative to this group. The strengthening was led by the Colombian peso, which appreciated influenced by some external and local factors. Despite the significant appreciation, there is still a relative weakness of the Colombian peso when comparing the dynamics of this currency with others in the region over a more extended period.

During the quarter, there was an improvement in liquidity levels and a marginal decrease in volatility. Meanwhile, hedging costs increased due to higher demand from different agents and the costs incurred by intermediaries to fund their operations. In addition, the evolution of *Banrep's* macroprudential measures indicators to control the exchange rate risk of Foreign Exchange Market Intermediaries (IMC in Spanish) suggests that the foreign exchange exposure of these agents remains limited.

2.5. Stock Market

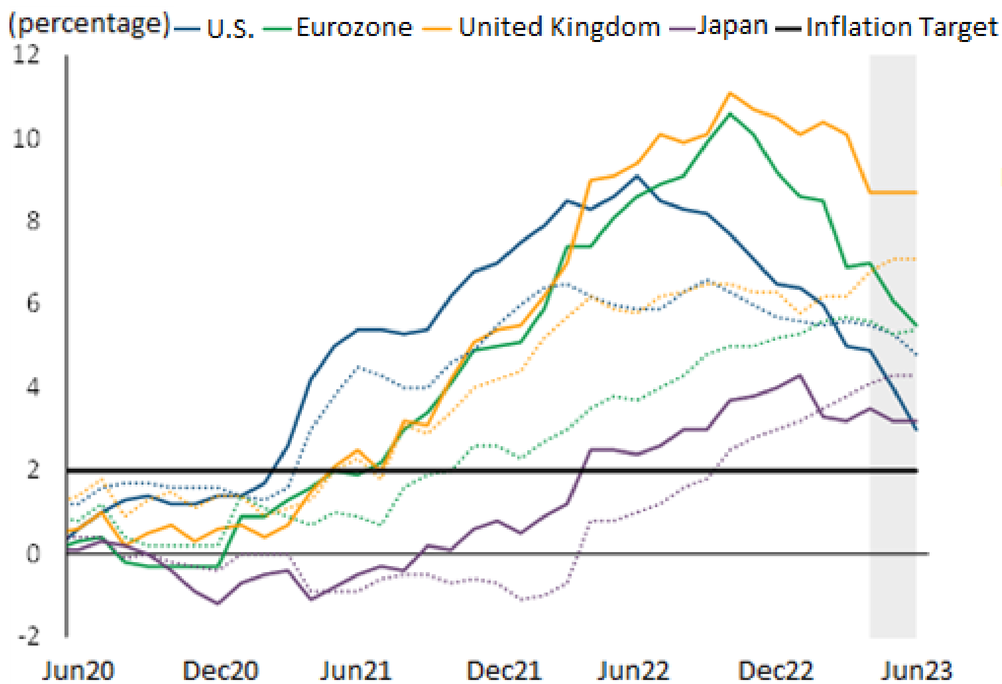
In an environment of increased risk appetite and greater resilience of economic activity, global stock markets had a positive performance during the second quarter of 2023, following the good performance of the previous quarter.

The MSCI COLCAP Index (created by MSCI and BVC to measure the performance of the Colombian equity market) underperformed the equity indexes of its regional peers and displayed the opposite behavior to other local markets. This performance was influenced by the decline of financial stocks and the drop in oil prices in a low liquidity environment.

3. International Environment

The global economic environment continues to show high inflation, still far from the main central banks' target, but continues to have corrections in response to lower supply and demand pressures. Inflation data published during 2Q23 in the major developed economies confirmed a marked downward trend in most of them after having peaked in June 2022 in the case of the United States, October 2022 in the Eurozone and the United Kingdom, and January 2023 in Japan (Graph 1).

Graph 1. Inflation in Developed Economies



Source: Bloomberg.
The solid lines correspond to headline inflation and the dotted lines to core inflation.

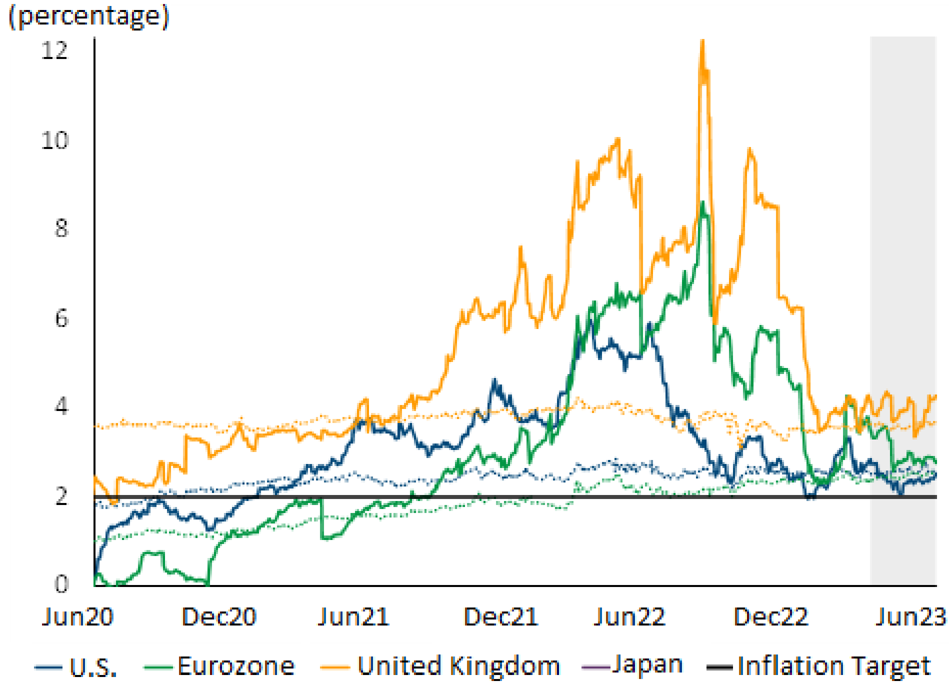
Core inflation[1] had a divergent behavior, continuing to rise in the United Kingdom and Japan, but declining (less sharply than in headline inflation) in the United States and the Eurozone This would suggest that, although supply pressures have corrected significantly, demand pressures have done so to a lesser extent and continue to affect price dynamics in these economies. Furthermore, inflation expectations drawn from the market[2] were corrected downwards during the quarter in

[1] Core inflation measures seek to eliminate the effects of temporary shocks on prices. To this end, those items with very volatile price behavior or that are beyond the control of monetary policy, such as food or some regulated products (fuels, utilities, transportation), are excluded. These measures provide information on the long-term trend of prices, and it is inflation that is directly affected by monetary policy decisions.

[2] According to the swaps market, one-year inflation expectations decreased 24 bps to 2.53% in the United States, 101 bps to 2.76% in the Eurozone, and 1 bps to 4.27% in the United Kingdom. Long term (5-year to 5-year) expectations remained around 2.5% in the United States and the Eurozone, and 3.7% in the United Kingdom.

several developed economies, but, in any case, they are still above the inflation target set by the central banks of these economies (Graph 2).

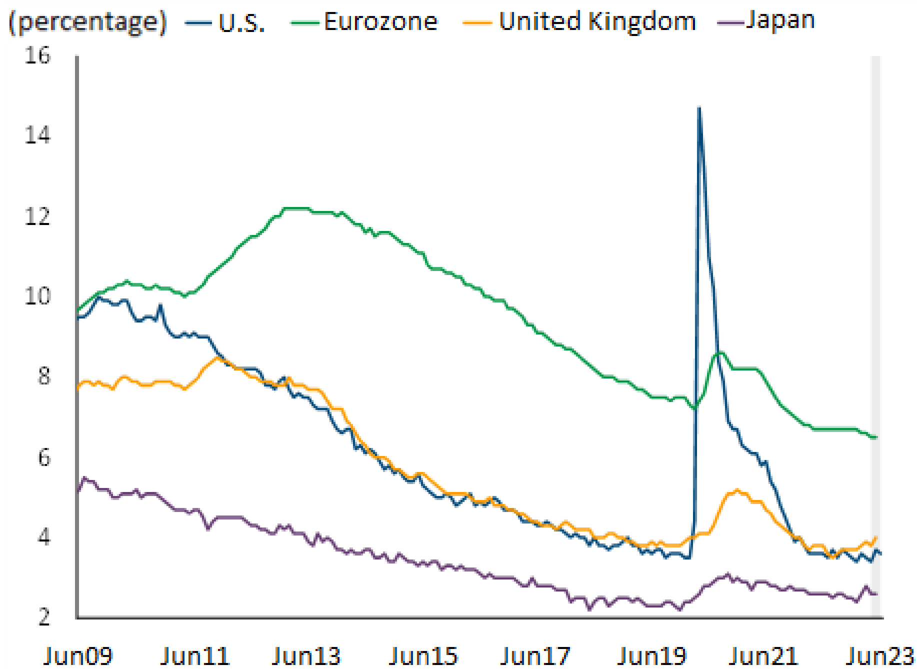
Graph 2. Inflation Expectations in the Swaps Market



Source: Bloomberg.
The solid lines correspond to one-year headline inflation expectations, and the dotted lines corresponded to long-term expectations (5-year to 5-year).

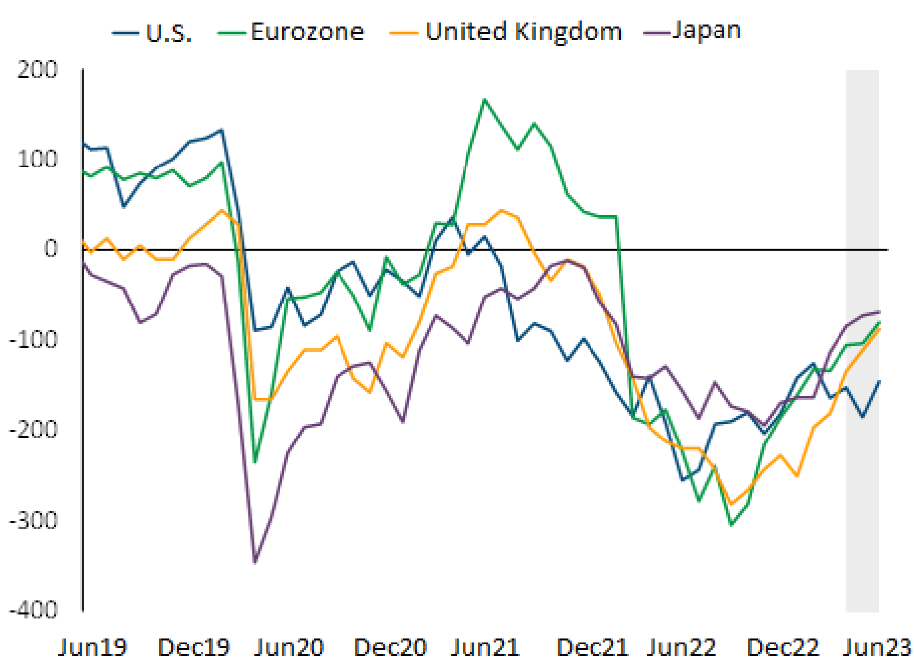
Meanwhile, economic activity in most countries has been more resilient than expected in the previous quarter. Over the last year, the market has been anticipating a global economic slowdown, and even a possible recession in the major developed economies, as a consequence of negative supply shocks (e.g., Russian invasion to Ukraine and the disruption of global supply chains after the post-pandemic recovery), the loss of purchasing power due to the sharp increase in inflation, and the contractionary monetary policy adopted by most central banks to contain this increase. Nevertheless, during the 2Q23, economic activity in the major developed economies surprised the market by continuing to have a resilient performance. This is evidenced, on the one hand, by the good performance of the labor market, which continued to show unemployment rates at levels similar to or lower than those observed prior to the beginning of the pandemic (Graph 3). On the other hand, consumer confidence continued to rebound in most of these economies from the low levels observed in mid-2022, although it is still below pre-pandemic levels (Graph 4).

Graph 3. Unemployment Rate in Developed Economies



Source: Bloomberg.

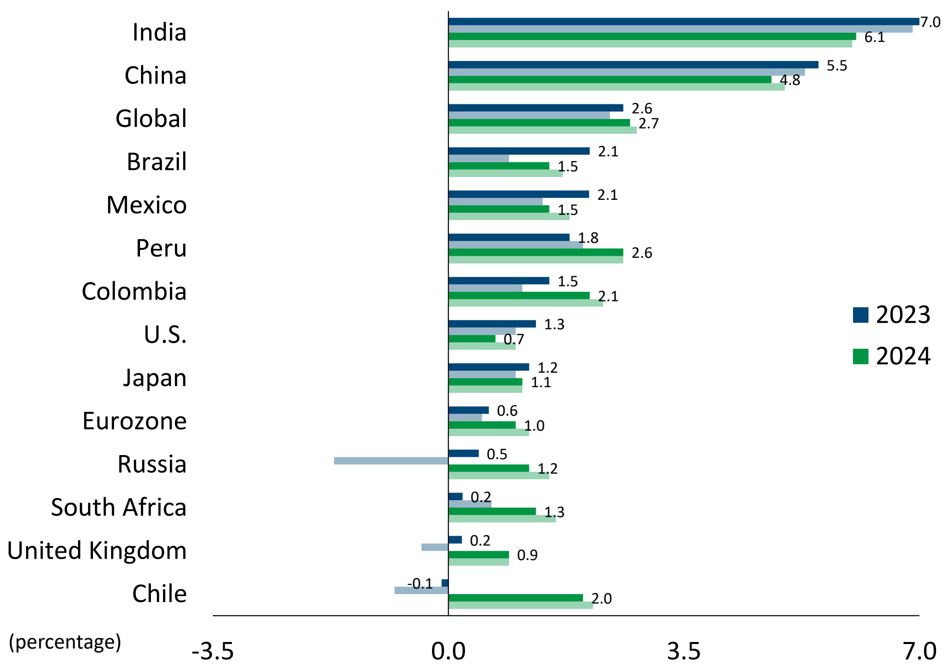
Graph 4. Consumer Confidence in Developed Economies



Source: Bloomberg.
The series are standardized with information since 2000. In the case of the United States, the consumer sentiment indicator measured by the University of Michigan is presented.

Thus, the bulk of both developed and emerging economies showed an improvement in their growth outlook for this year along with a reduction for next year (Graph 5). Contrary to the global trend, the Chinese economy has not shown the upturn that the market was expecting after the end of the Zero-Covid policies at the end of last year. Thus, although it is projected to contribute, along with India, to half of global growth over the next few years, it is expected to grow this year and next year below the average level of 6.0% that it had been registering during the years prior to the beginning of the pandemic.

Graph 5. Growth Forecast



Source: Bloomberg.
The darkest bars correspond to the most recent expectations (June) and the lighter bars to March 2023 expectations.

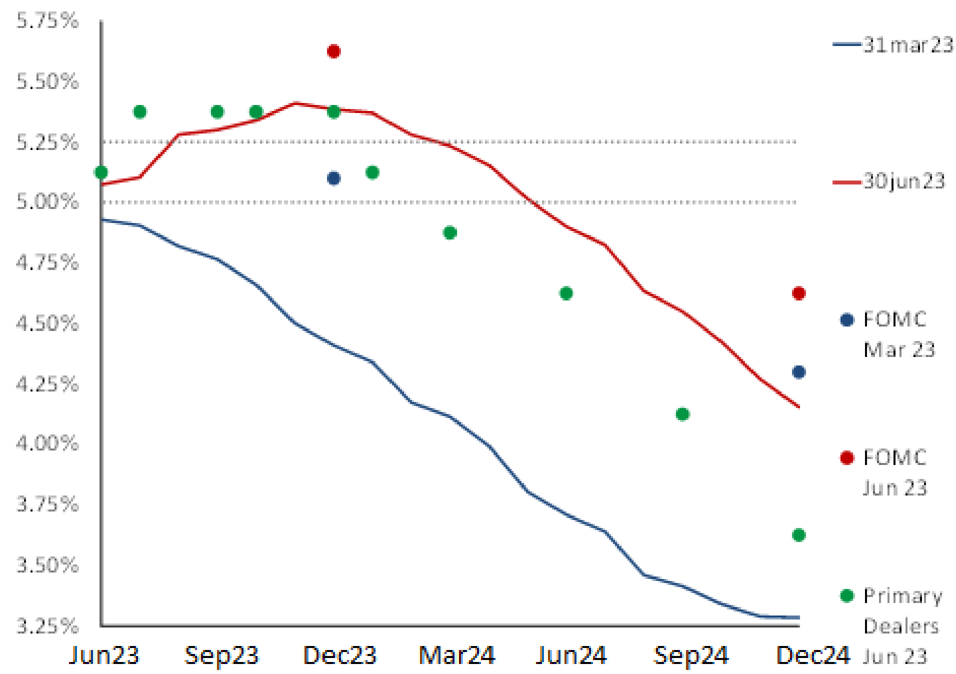
In this context, most developed economy central banks continued with the cycle of benchmark interest rate increases during the second quarter, and the market expects additional increases for the rest of the year with a higher terminal rate than expected in the previous quarter. Given that inflation levels persist above the monetary authorities' target and aggregate demand has shown a resilient performance, during the 2Q23, the central banks of the United States (Federal Reserve, FED), the Eurozone (European Central Bank, ECB) and the United Kingdom (Bank of England, BoE) continued to adopt a contractionary monetary policy by maintaining the reduction of their balance sheet and increasing their interest rates by 25 bps, 50 bps, and 75 bps, respectively. In particular:

- During its June meeting, the Federal Reserve decided to pause the interest rate hike cycle to assess the impact of monetary policy on prices and economic activity. However, it stated that two additional rate hikes (of 25 bps each) could come during the second half of 2023.

In turn, the market[3] projects a final 25 bps hike during its July meeting and a potential start of the tightening cycle as of 1Q24 (Graph 6).

- In the case of the ECB and BoE, the market[4] projects further increases in monetary policy rates in the medium term, compared to the current level and to what was anticipated in the previous quarter.
- Finally, the Bank of Japan (BoJ) maintained its expansionary monetary policy unchanged during the quarter, but the market continues to expect a potential change in the yield curve control 4F[5] and a possible increase in the monetary policy rate, which would return to positive territory in the short term (Graph 7).

Graph 6. Implied Path of U.S. Monetary Policy (Futures Market)



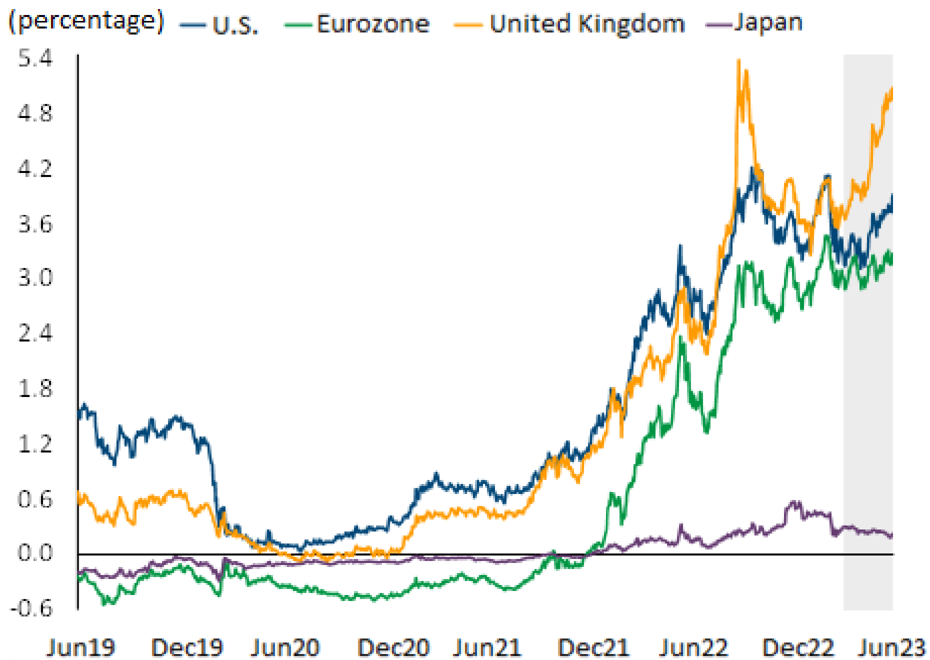
Source: Bloomberg, Federal Reserve.
The dotted lines indicate the target range for the Federal Funds rate, in effect as of 30 June.

[3] According to the New York Fed's survey of Primary Dealers and implied expectations in the futures market.

[4] According to the five-year Overnight Index Swaps (OIS) rate. This rate reflects the expectation on the average monetary policy rate over the next five years.

[5] In addition to maintaining the monetary policy rate at -0.1%, the BoJ also has a yield curve control program through which it seeks to buy the necessary amount of long-term sovereign bonds in order to maintain the 10-year bond yield at 0.0% with a tolerance range of +/- 50 bps. The market expects the BoJ to modify this program in the coming months, either by increasing the target rate or the tolerance range of the 10-year bond or by changing the target bond to a shorter-term bond.

Graph 7. Five-Year OIS Rates



Source: Bloomberg.

This resulted in devaluations of public debt instruments in developed economies, contrary to the behavior observed during the first quarter of the year (See Table 1 and Fixed-Income and Money Markets).

In terms of risk perception, during the quarter there was a greater risk appetite due to lower uncertainty regarding the resilience of regional financial institutions, the debt ceiling in the United States, and the future of Credit Suisse in Europe. In 1Q23, there was an increase in global risk aversion as a consequence of the failure of some regional banks in the United States and the episodes related to the decline of Credit Suisse. In contrast, during 2Q23 there were no additional episodes that questioned the resilience of the banking sector, and the future of Credit Suisse began to be resolved with its subsequent acquisition by UBS. Furthermore, although negotiations between the Congress and the U.S. government on raising the debt ceiling generated some occasional episodes of risk aversion during the quarter, the agreement reached between both parties at the beginning of June brought about a renewed appetite for risk assets at a global level. In this context, the international risk perception indicators, VIX[6] and 6F[7], had downward corrections that took them to levels similar to those observed during 2019. Although MOVE [8] also showed a strong downward correction, it remains at high levels compared to its history, which

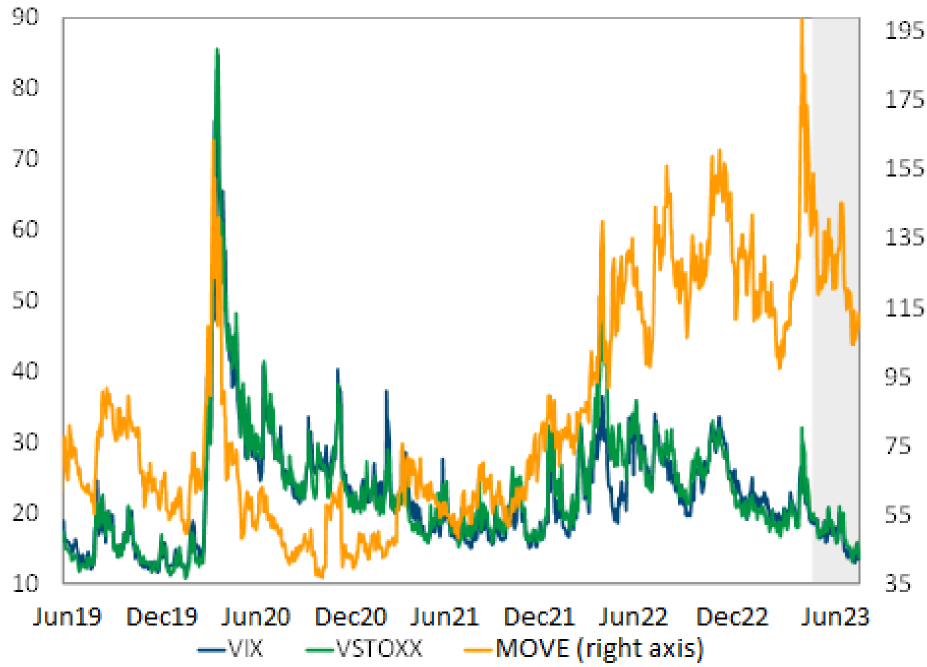
[6] The VIX reflects the implied volatility of 30-day options on the S&P 500 index.

[7] The VSTOXX reflects the implied volatility of 30-day options on the Euro Stoxx 50 index.

[8] The MOVE reflects the implied volatility in 30-day options on U.S. Treasuries.

reflects the high uncertainty regarding the future of monetary policy in the United States (Graph 8).

Graph 8. International Risk Perception Indicators

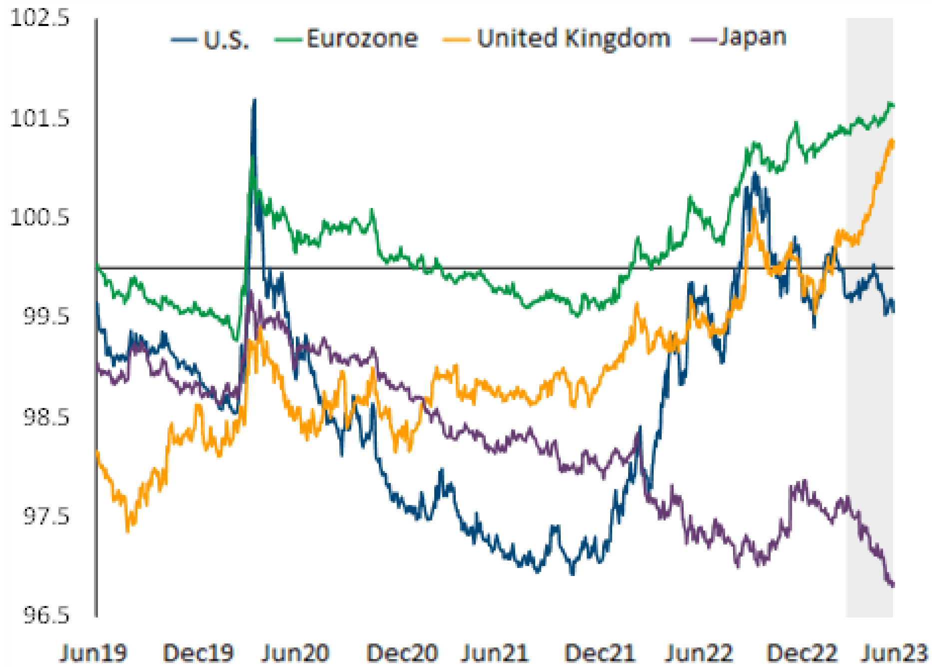


Source: Bloomberg.

Along with the increased global risk appetite, stock markets continued to have a good performance (see Stock Market), while most currencies (see Foreign Exchange Market) and public debt instruments (see Fixed-Income and Money Markets) appreciated in emerging economies. The appreciation of public debt instruments in emerging economies was also associated with the consolidation of the downward trend in inflation, which would allow the central banks of several of these economies to begin the cycle of interest rate reductions during the second half of the year (see Table 1).

In this context, global financial conditions remain tight in some economies, with corrections in the United States and Japan. In the case of the United Kingdom and the Eurozone, financial conditions continued to tighten due to expectations of a more persistent contractionary monetary policy path. On the contrary, in the case of the United States, although there was some volatility, the quarter closed with looser financial conditions due to the good performance of the stock market, the compression of private debt margins and, to a lesser extent, the slight strength of the US dollar, which offset expectations of further increases by the Federal Reserve. Finally, financial conditions in Japan declined sharply due to the good performance of that stock market (Graph 9, see Stock Market).

Graph 9. Financial Conditions Index

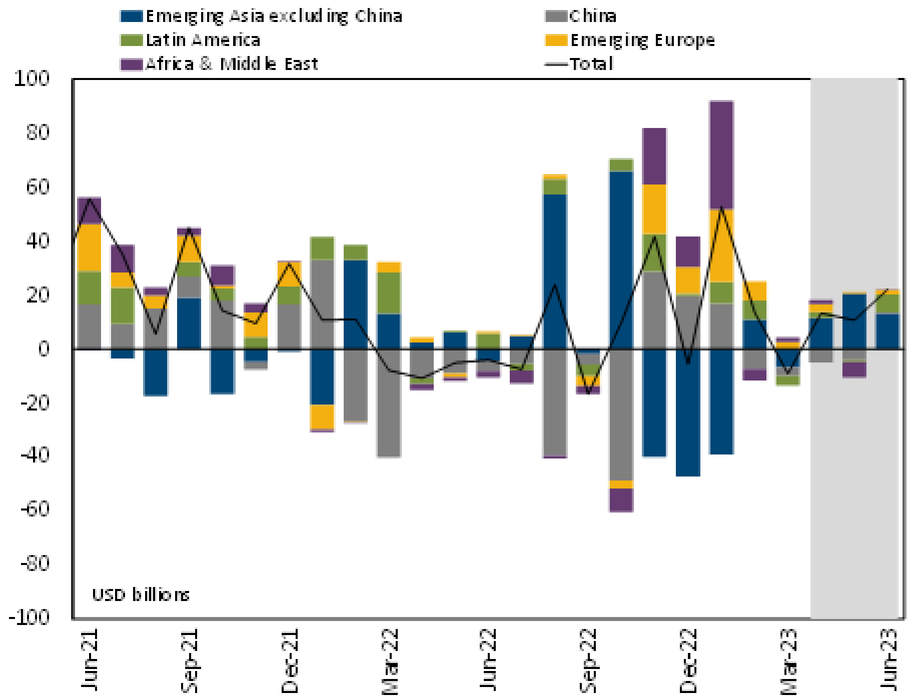


Source: Goldman Sachs.

Along with the increased global risk appetite, foreign portfolio investment flows to emerging economies, particularly to emerging Asia (excluding China) and Latin America, were positive during the quarter. According to preliminary figures published by the Institute of International Finance (IIF), in 2Q23 there were net inflows of USD46.2 billion (b).[9], of which Latin America had the second largest net inflows (after emerging Asia, excluding China) for a total of US$8.3 billion (Graph 10).

[9] USD21.9 billion and USD24.4 billion were allocated to the fixed income and equity markets, respectively; 48% percent of the total flows for the quarter were observed in June (USD21.1 billion).

Graph 10. Foreign Portfolio Investment Flows to Emerging Economies



Source: IIF.
Figures in US$ billions.

Regarding oil prices, the WTI and Brent benchmarks had a volatility similar to the one observed during 1Q23 and depreciated compared to the close of the previous quarter. WTI crude oil showed a devaluation of 6.6%, while the price of Brent dropped by 6.1%, even falling below $60 dollars per barrel (d/b)[10] during the quarter under analysis. Prices were mainly affected by the outlook of lower demand justified by expectations of higher interest rates from European central banks and the FED, and weak demand for fuel from the U.S. and China. However, these downward pressures were partially contained by a tighter supply. In particular, following Russia's cut in crude oil production during March[11], both OPEC+ and Saudi Arabia individually announced cuts in their daily production[12] (Graph 11).

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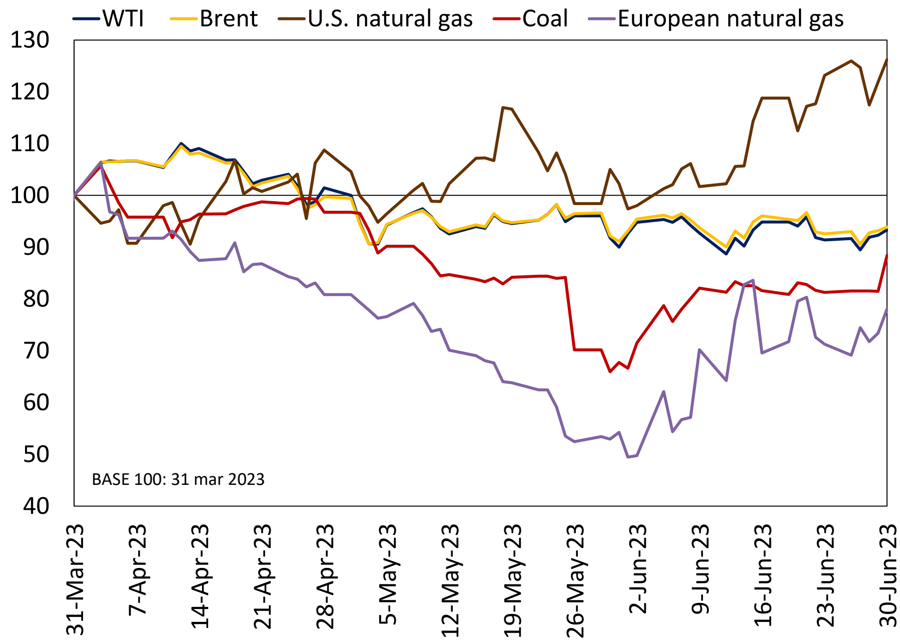
[10] WTI crude oil averaged USD73.6 d/b (USD2.5 d/b lower than the previous quarter), while Brent averaged USD75.3 d/b (USD6.8 d/b lower than 1Q23).

[11] On 10 February, Russian Prime Minister Alexander Novak informed that Russia would cut production by 500,000 b/d through March in response to the price cap imposed in December by the EU and the U.S.

[12] On 3 April 2023, OPEC+ announced a reduction in its daily production target by 1.16 million barrels per day from May through the end of 2023, meaning a reduction of about 2.0% of global oil demand. It would later announce an extension of the cut until the end of 2024. Saudi Arabia also announced a voluntary production cut by 1 b/d by July 2023.

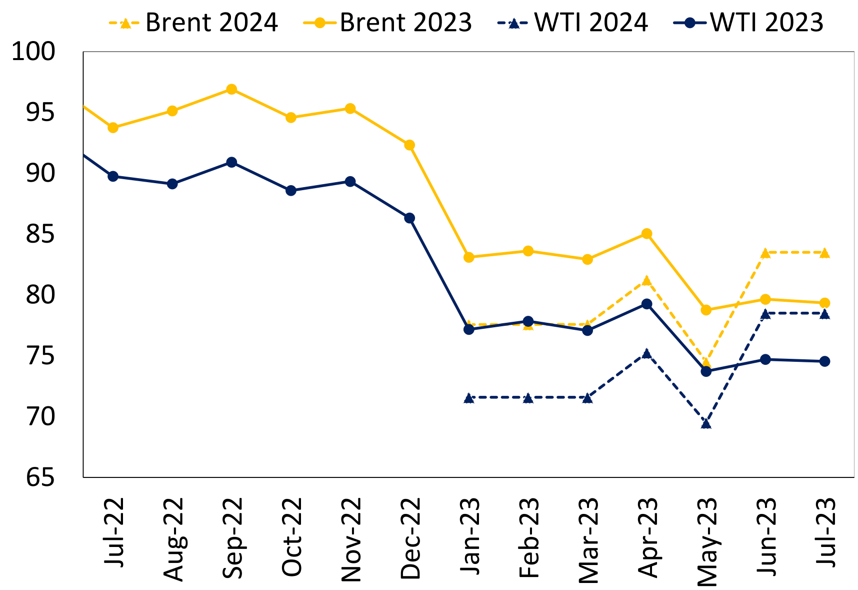
Graph 11. Change in Prices of Energy-Generating Products



Source: Bloomberg.

Nevertheless, the U.S. Energy Information Administration (EIA) increased its average oil price outlook for 2023 and 2024 in its latest report. This is in line with a lower production level by the top crude oil producers, in addition to the reduction of inventories and expectations of a higher demand during the second half of 2023 (Graph 12).

Graph 12. Oil Price Forecasts (Annual Average Spot Price)



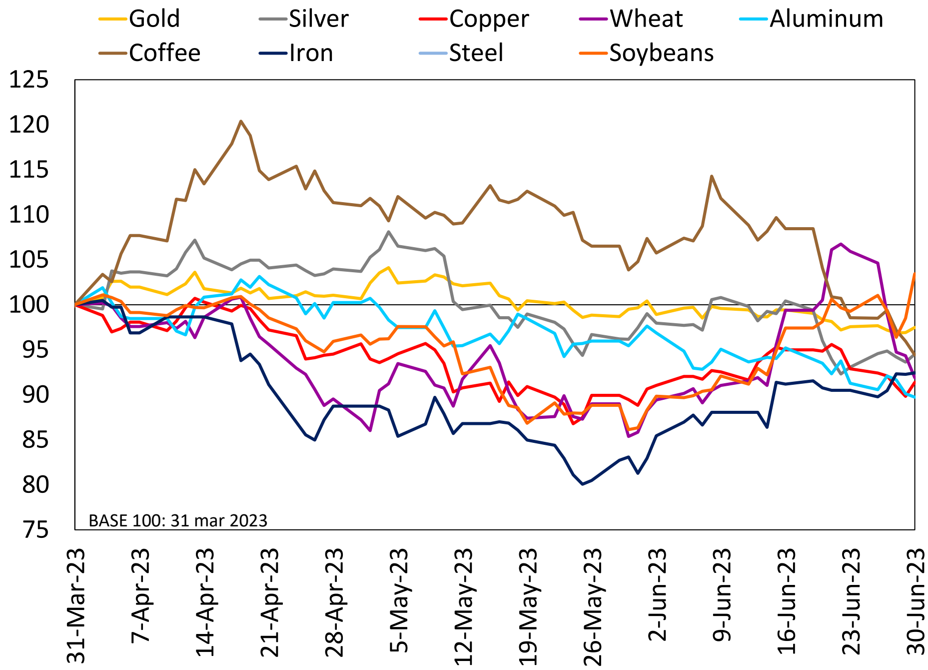
Source: EIA Short-Term Energy Outlook (STEO).
As of January 2023, the EIA incorporated forecasts for 2024. The latest values correspond to the July 2023 STEO.

Concerning the prices of other energy-generating, the European and U.S. liquefied natural gas (LNG) benchmarks showed different behavior, while coal depreciated in value. The European LNG benchmark (Dutch TTF natural gas) depreciated in value over the quarter on lower fears of insufficient supply for the winter and lower demand due to milder weather. On the other hand, the U.S. benchmark showed strong appreciation in response to higher seasonal demand (Graph 11).

Other commodities such as precious metals and industrial goods depreciated. Gold and silver closed with devaluations[13] following the BoE's rate hike and expectations of higher interest rates by the FED, in an environment of uncertainty and risk perception at a global level (see International Environment). Industrial commodity prices were largely driven by weaker-than-anticipated demand from China and prospects for a slower economic recovery. However, interest rate cuts by the People's Bank of China to boost the economy may have had an impact, limiting these devaluations (Graph 13).

Graph 13. Change in Commodity Prices

[13] Gold and silver closed with devaluations of 2.5% and 5.5%, respectively.



Source: Bloomberg.

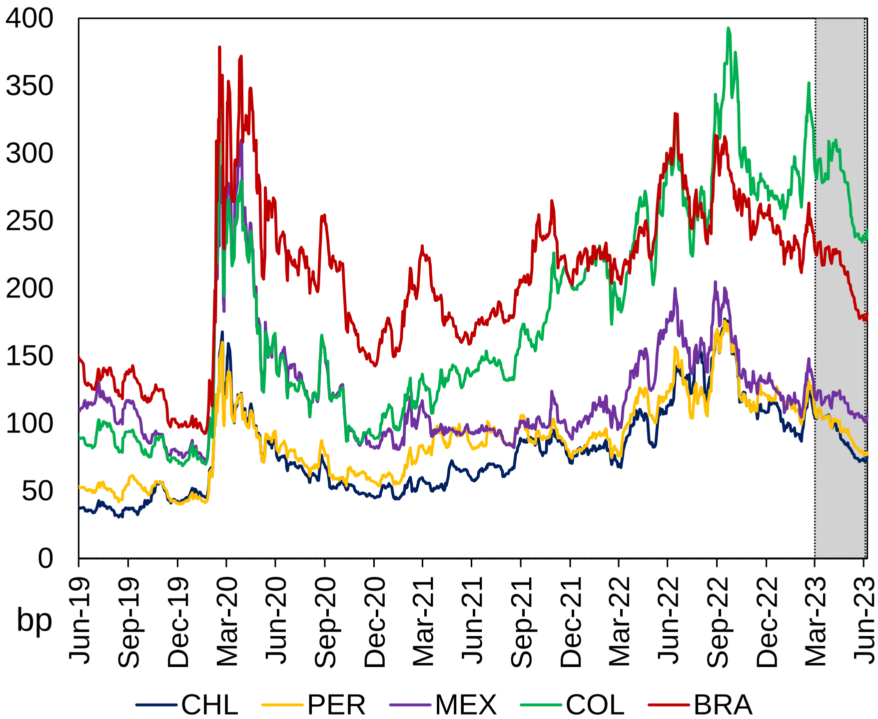
Finally, during the quarter, agricultural commodities such as wheat and coffee depreciated (8.1% and 5.6%, respectively), while soybeans appreciated 3.4%. The price of coffee, although it has remained at high levels since 2021, depreciated during the last week of June due to the expectation of higher production in Brazil and expectations of greater supply during the second half of 2023. However, factors such as the El Niño phenomenon could increase prices due to a potential drought. Soybeans, on the other hand, appreciated due to supply fears, in view of drier weather that may affect their production (Graph 13).

4. Risk Perception at the Local Level

In addition to the higher risk appetite at the global level, the lower risk perception at the local level was also favored by some idiosyncratic factors. Among these are: *i*) the expectation that headline inflation has reached a ceiling in 1Q23, which, according to the market, would allow *Banco de la República* to start a cycle of interest rate cuts during the second half of the year (see Colombian Money Market); *ii*) the favorable perception of local institutions' strength, which have played an important role in the review and discussion of the reforms proposed by the Government; and *iii*) the announcements by Moody's risk rating agency, which ratified the investment grade of Colombian public debt, improved the growth outlook for this year of about 1.0% to 1.5%, and acknowledged that the Government's record of prudent macroeconomic policies has been maintained.

In this context, CDS performed better locally than its peers in the region. The country's 5-year CDS declined 52 bps, while the average CDS of its peers in the region and other emerging countries dropped by an average of 33 bps and 16 bps [14], respectively (Graph 14). In turn, the EMBI+ [15] decreased on average 25 bps in the countries of the region; 24 bps in a sample of emerging countries; and 19 bps in the case of Colombia (Graph 15).

Graph 14. Five-Year CDS in Latin America

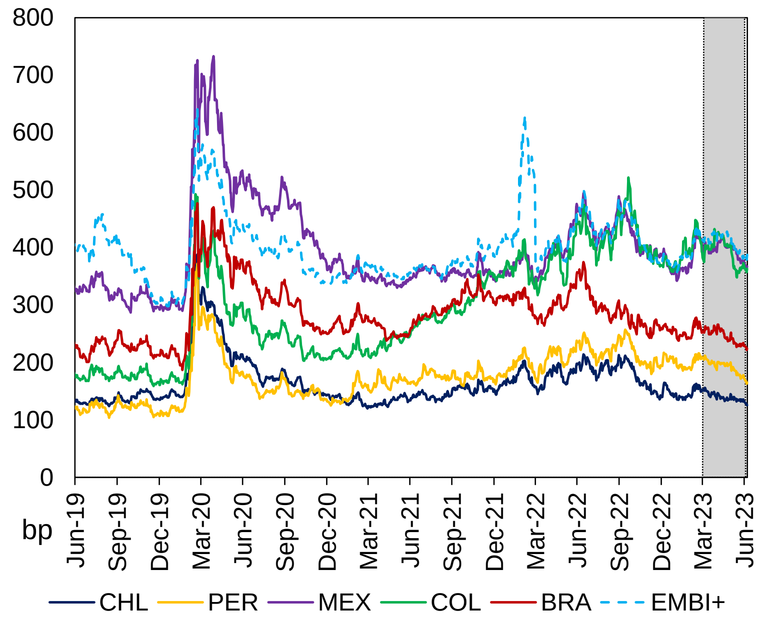


Source: Bloomberg.

[14] Based on Markit CDX Emerging Markets Index (CDX EM), composed of eighteen sovereign issuers in Latin America, EMEA, and Asia.

[15] The EMBI+ is a country risk indicator calculated by JP Morgan. It consists of the difference (expressed in basis points, bps) between the interest rate paid on fixed-income securities in dollars issued by emerging countries in international markets and the interest rate of U.S. Treasuries, which are considered risk-free assets. An increase in this indicator reflects higher credit risk of the issuing country.

Graph 15. Latin America Sovereign Debt Spreads (EMBI+)

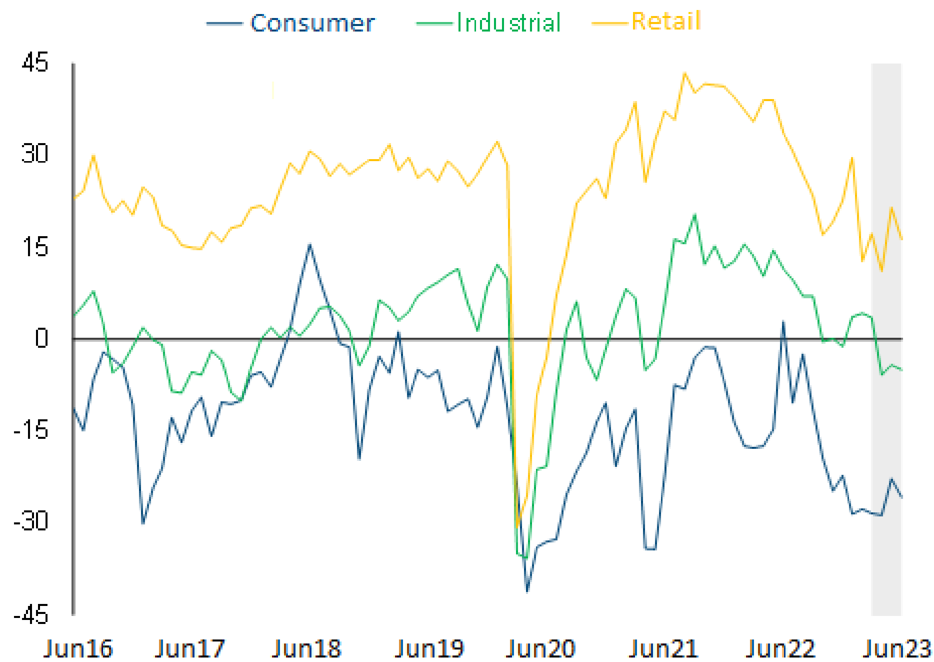


Source: Bloomberg.

Along with the improved local risk perception, business and consumer confidence increased during the quarter[16]. The increase in consumer confidence was due to an improvement in both consumer expectations and perceptions of economic conditions. Although this indicator remains in negative territory, the improvement observed during the quarter brought it back to levels not seen since September 2022. Likewise, business confidence rebounded as a result of a better perception of companies' current economic situation and more optimistic expectations for the next six months. On the contrary, industrial confidence deteriorated and fell into negative territory due to a lower volume of orders and lower production expectations for the next quarter (Graph 16).

[16] Confidence indexes are diffusion indicators, that is, based on qualitative questions, a balance is obtained on those who expect an improvement versus those who expect a deterioration. The critical value of the index is zero; hence positive values reflect optimism and negative values reflect pessimism.

Graph 16. Confidence Indicators

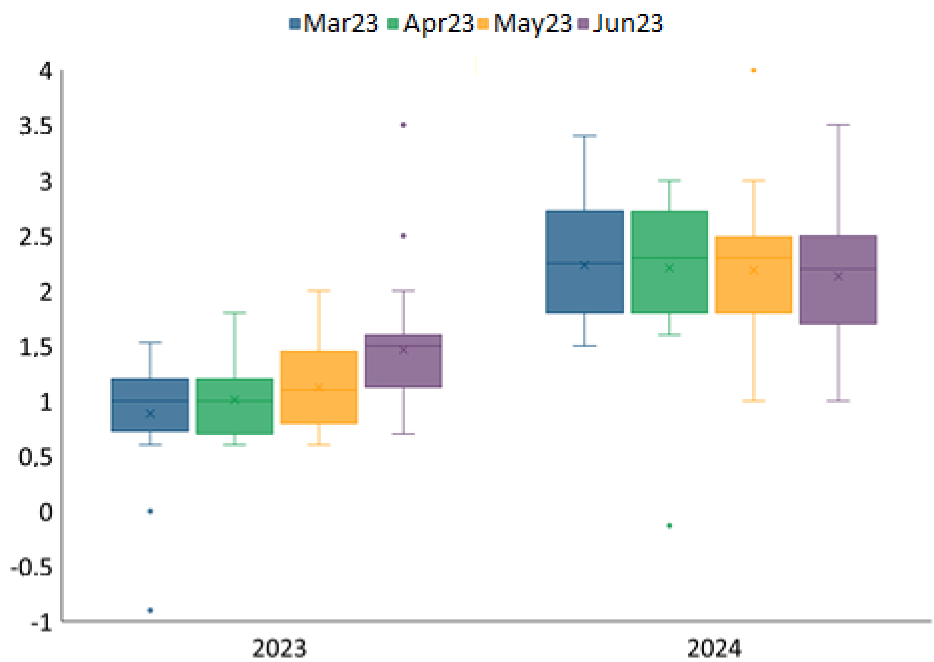


Source: Fedesarrollo.

On the other hand, according to the Financial Opinion Survey[17] (EOF in Spanish), during the quarter there was a better growth expectation for 2023, a deterioration of the outlook for 2024, and inflation expectations similar to those recorded in the previous quarter. Growth expectation for 2023 increased from 1.0% in March to 1.5% in June. Expectations for 2024 decreased from 2.30% to 2.20% (Graph 17). Regarding inflation expectations, the same survey shows that these remained around 9.2% and 5.2% for 2023 and 2024, respectively (Graph 18).

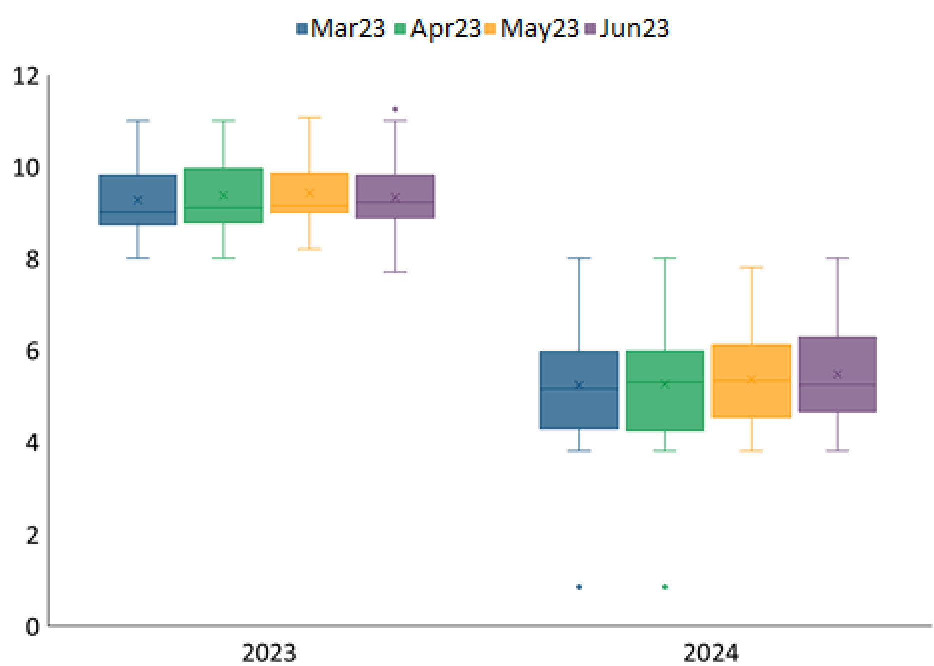
[17] Survey conducted monthly by Fedesarrollo and the BVC.

Graph 17. Growth Forecast



Source: Financial Opinion Survey (EOF) of Fedesarrollo and the BVC.

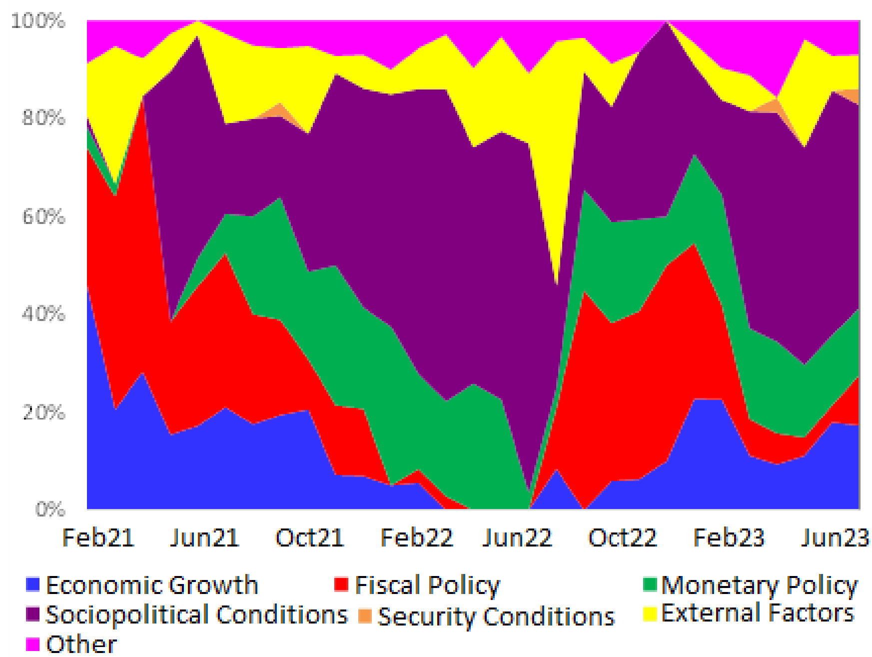
Graph 18. Inflation Expectations



Source: Financial Opinion Survey (EOF) of Fedesarrollo and the BVC.

Despite the correction of risk perception at the local level, it is still high compared to its peers in the region. This is consistent with the dynamics of negative foreign portfolio investment flows in Colombia [18] (see Domestic and Foreign Public Debt Market), which was different during the quarter compared to that of other emerging economies (see International Environment). On the other hand, according to several market analysts, in the short term, local risk perception will continue to reflect high uncertainty and will continue to be influenced by the adjustment path of variables such as inflation, fiscal and current account deficits, the reform agenda in Congress, and the evolution of socio-political conditions. The latter is reflected in the results of the EOF, which over the last few months has persistently indicated that nearly half of the agents surveyed consider socio-political conditions to be the most relevant factor when investing in Colombia (Graph 19).

Graph 19. Most Relevant Factors when Making Investment Decisions



Source: Financial Opinion Survey (EOF) of Fedesarrollo and the BVC.

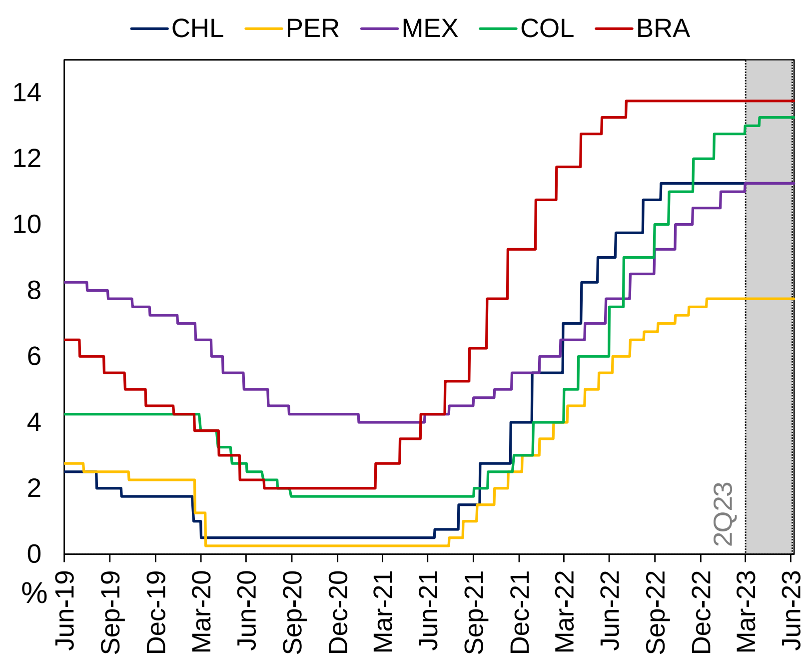
[18] According to information from the foreign exchange balance of *Banco de la República*, there were portfolio investment outflows of US$0.91 billion in the country during the quarter.

5. Fixed-Income and Money Markets

5.1. Monetary Policy and Inflation in Latin America

In the second quarter of 2023, the region's central banks slowed the pace of monetary policy tightening[19]. Particularly, Colombia reduced the magnitude of the benchmark rate increases by 25 bps in 2Q23, while in 1Q23, it increased by 75 bps. The dynamics of the MPR in the region takes place in a context of a slowdown in inflation growth and expectations of an approaching end to monetary policy rate hikes in the U.S. and the Eurozone[19] (Graph 20).

Graph 20. Monetary Policy Rates in Latin American countries



Source: Bloomberg.

At the local level, the Board of Directors of *Banco de la República* (BDBR) increased the benchmark rate in April by 25 bps, while in the June meeting, it kept the rate unchanged. These decisions considered the following elements:

- Annual consumer price inflation declined in June for the third consecutive month and stood at 12.13%, led by the evolution of food prices, whose annual inflation decreased from 27.8% in December 2022 to 14.3% in June 2023.

[19] In the second quarter of 2023, the central banks of Brazil, Mexico, Chile, and Perú kept their policy rates unchanged at 13.75%, 11.25%, 11.25%, and 7.75%, respectively. In the previous quarter, the central banks of Mexico and Perú raised the MPR by 75 bps and 25 bps, in that order. The central banks of Brazil and Chile have not changed their MPR for two consecutive quarters.

- The slowdown in economic activity that began to be observed as of the fourth quarter of 2022 and has continued during the first months of 2023, but at a slower pace than expected. As a result of the slowdown in consumption and the contraction in gross capital formation, GDP recorded annual growth of 3.0% in the first quarter of 2023, lower than in the same quarter of the previous year (8.1%).
- Headline inflation expectations for terms greater than or equal to one year have begun to fall but are still above the target.
- The Colombian peso has appreciated by around 9.0% so far this year, and Colombian risk premiums have decreased substantially, partially reversing the relative losses of the previous two years compared to other emerging economies.

During the quarter, inflation showed greater reductions in all countries of the region compared to the behavior observed during the first quarter of the year, and, in most cases, it is still above the central banks' target level.[20]. The drop in inflation occurred in an environment where the MPR reached maximum levels of more than 20 years. Inflation in Colombia fell 121 bps during the quarter, led by the behavior of food prices. However, there are still increases in inflation of regulated products (fuel, utilities, transportation) and in services inflation (Graph 21 and Table 2).

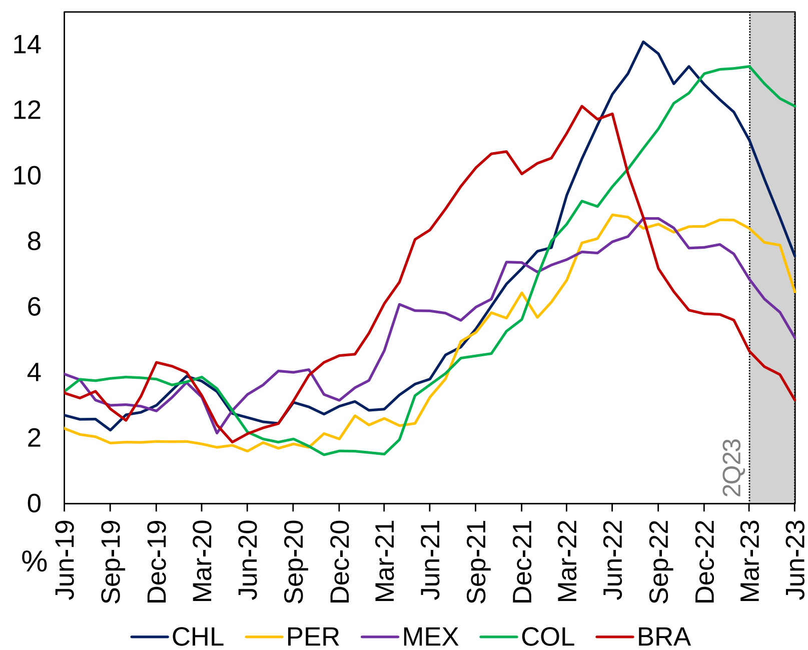
Table 2. Inflation Last Two Quarters and Inflation Target 2023

Country	March 2023	June 2023	Target
COL	13.34%	12.13%	3.00%
BRA	4.65%	3.16%	3.25%
CHL	11.09%	7.56%	3.00%
MEX	6.85%	5.06%	3.00%
PER	8.4%	6.46%	2.00%

Source: Bloomberg and central banks in the region.
Based on the reports in central banks' websites.

[20] Brazil is the only country in the region where inflation is already close to its target of 3.25%.

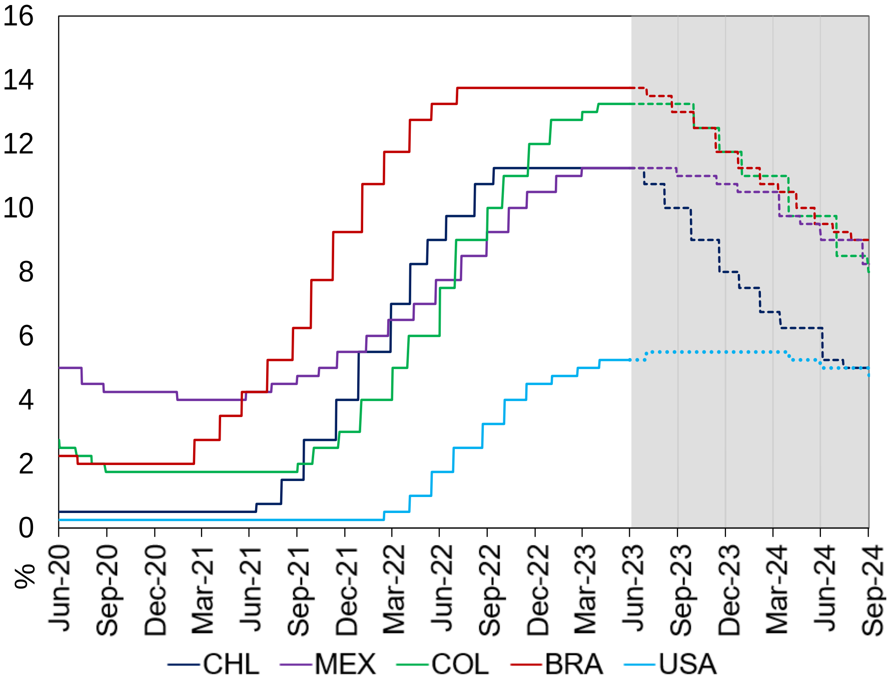
Graph 21. Inflation in the Countries of the Region



Source: Bloomberg.

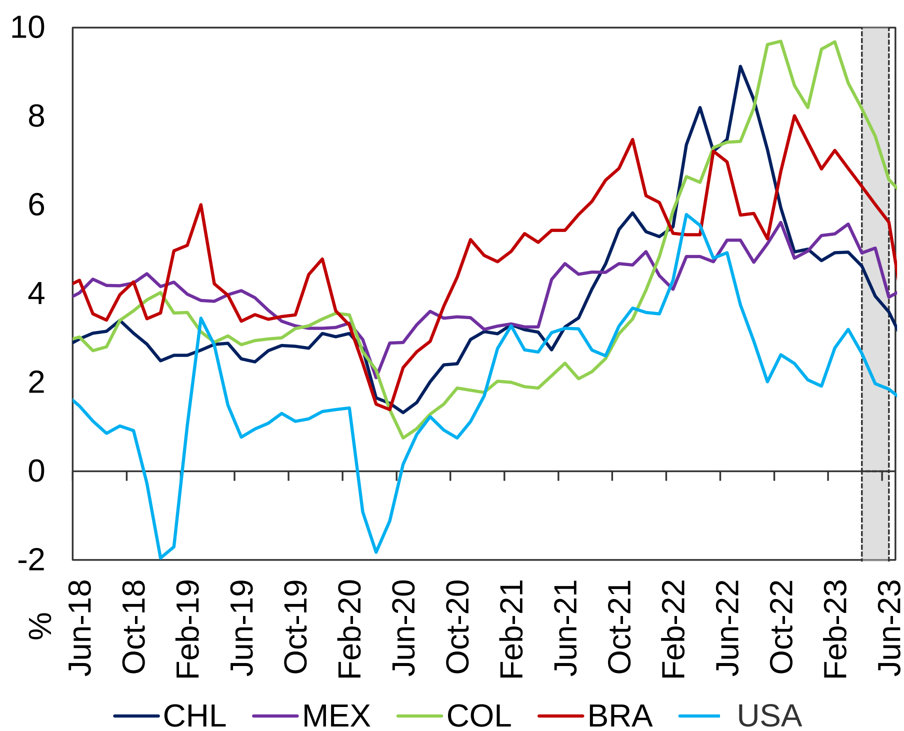
Along with the reduction in inflation, financial markets began to anticipate reductions in the MPR in the region's countriesduring the second half of 2023. 1-year OIS market rates in Brazil, Chile, Mexico, and Colombia dropped between 10 bps and 79 bps, suggesting expectations of a less contractionary MPR by 2023. These markets project paths with MPR reductions for the second half of the year. This contrasts with the U.S. expectations, where the market anticipates a federal funds rate hike in July 2023 and reductions until after the first quarter of 2024 (Graph 22). Expectations of reductions in the MPR in the **region's countries** are in line with the reductions in inflation expectations that can be extracted from different financial instruments (Graph 23).

Graph 22. Market-Implied MPR Expectations



Source: Bloomberg and *Banrep*.

Graph 23. One-Year Market-Implied Inflation Expectations

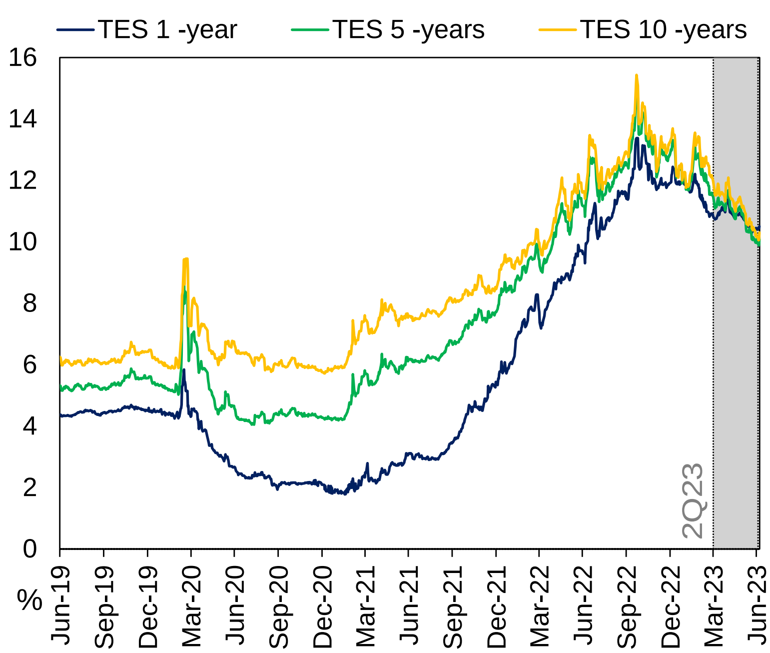


Source: Bloomberg and *Banrep*.

The information for Chile is obtained as the breakeven inflation of the Chilean Average Chamber Swaps for the one-year term. In the case of Brazil, Mexico, and the U.S., data from Bloomberg's BEI is used.

In Colombia, the Breakeven Inflation (BEI), which is extracted from peso- and UVR-denominated Colombian sovereign bonds (TES), decreased during 2Q23. The reductions observed for the 1-, 5-, and 10-year terms were 194 bps, 80 bps, and 92 bps, respectively. As of 30 June 2023, they stood at 6.38%, 5.98%, and 6.02%, in that order (Graph 24).

Graph 24. 1-Year, 5-Year, and 10-Year Implied Inflation Expectations in the Public Debt Market

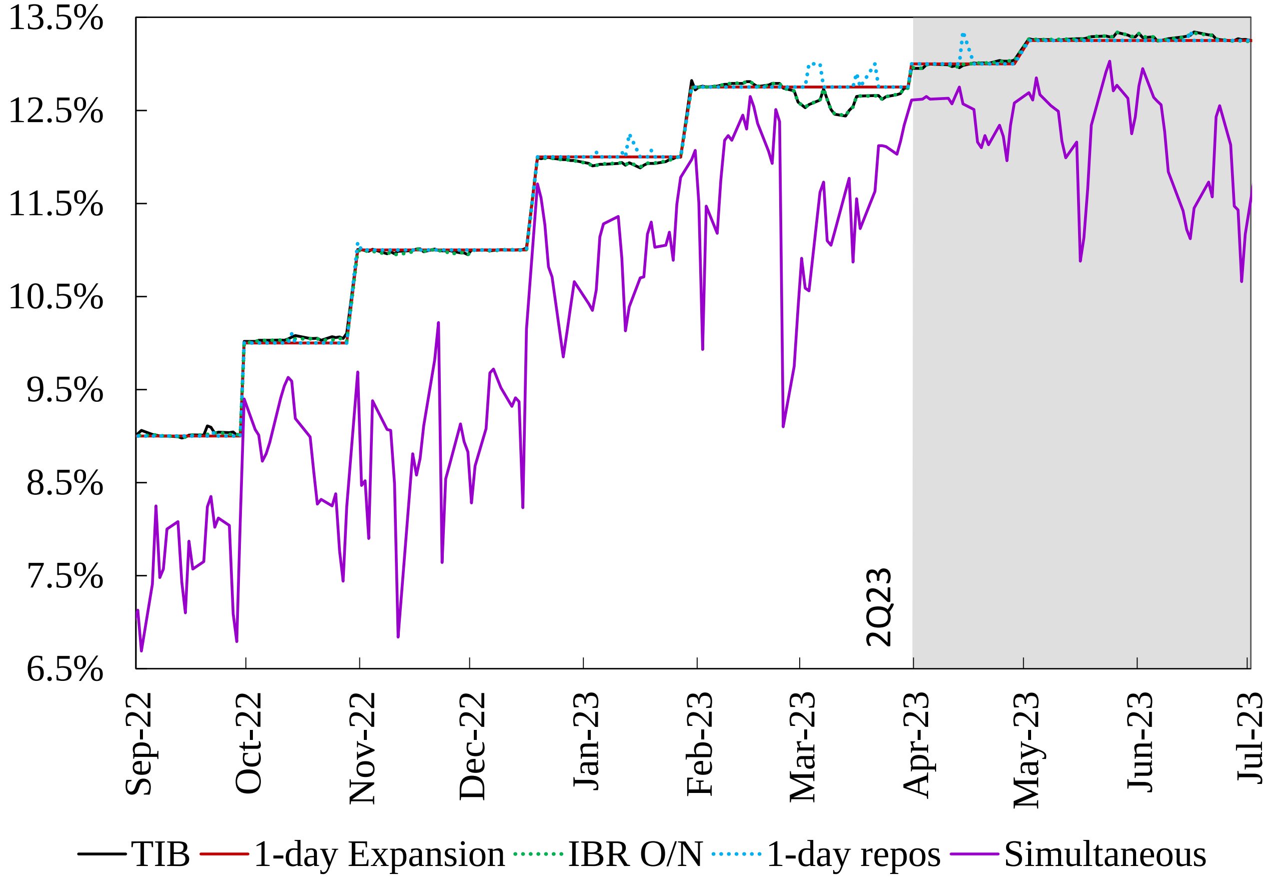


Source: *Banrep.*

5.2. Colombian Money Market

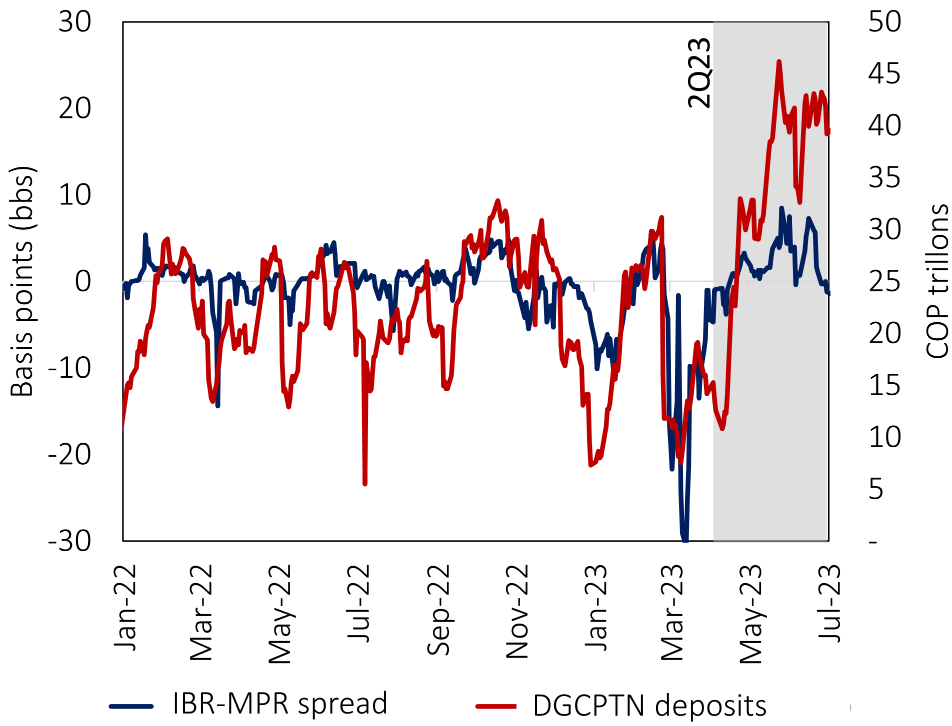
In the money market, the IBR O/N rate was at levels very close to the MPR during the quarter; however, there were some positive differences in specific periods, evidencing some liquidity tightening in the money market. This event began to be observed in the middle of May; the maximum difference between these rates was 8.5 bps, and the average difference was at low levels (1.8 bps). Such difference can be partly explained by the high deposits of the General Directorate of Public Credit and the National Treasury (DGCPTN in Spanish) in *Banrep* (Graph 25 and Graph 26).

Graph 25. *Banco de la República's* Benchmark Rate, Interbank Rate (TIB), and IBR O/N



Source: Bloomberg and *Banrep*.

Graph 26. National Account Balance at *Banrep* and Spread between O/N IBR and MPR



Source: *Banrep*.

***Banrep* offered term repos[21] and made purchases in the local public bond market in order to provide permanent liquidity to the economy and prevent the IBR from deviating from the MPR.** In particular, in May and June 2023, *Banrep* made outright purchases of TES B in the market for COP 3,124.1 billion and COP 1,711.7 billion (values at market prices), respectively. At the end of June 2023, the outstanding balance of TES held by *Banrep* stood at COP 43,751.4 billion (value at market prices). These types of transactions are commonly used by *Banrep* to adjust the necessary levels of liquidity to ensure an effective transmission of monetary policy.

***Banrep's* intervention to promote an adequate behavior in the system's liquidity is not a new behavior**, as shown in Box 2: Central bank asset purchases in response to the Covid-19 crisis . This box's main objective is to summarize the core findings on the experience of several central banks with intervention through asset purchases during the Covid-19 pandemic.

5.3. Domestic and Foreign Public Debt Market

The term structure of local currency public bonds for most developed countries showed devaluations in all maturities during 2Q23 in response to uncertainty about the future of

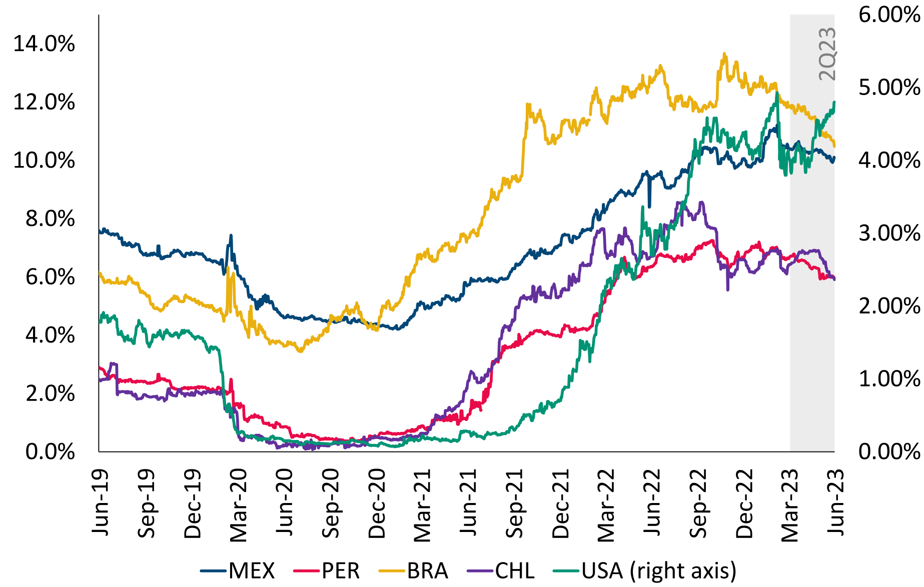
[21] In the first quarter, 1-day- and 7-day-term repos were offered, and as of May, 14-day and 30-day repos were offered.

inflation dynamics and the monetary policy path. Short-term rates depreciated more than long-term rates due to expectations that central banks in developed economies will continue with the cycle of rate hikes to guarantee the convergence of inflation to its targets, due to the persistence of inflationary pressures and the strength of the labor market, causing the slopes of these countries' curves to become more negative (Graph 27, Graph 28, and Graph 29).

In the region, local currency government bonds showed appreciation (Graph 30, Graph 31, and Graph 32). This behavior is associated with market expectations of ending the rate-hike cycle in the coming months and an improved global appetite for risk assets. They were also driven by the downward trend in inflation data and expectations and the economic slowdown in several of these economies. The behavior of public debt in the region is also due to some idiosyncratic factors.[22]

Local public bonds have continued with the trend of appreciation of zero-coupon rates of peso-denominated TES and, to a lesser extent, of those denominated in UVR (Graph 30, **Graph 31**, **Graph 32, and see Monetary Policy and Inflation in Latin America**). UVR-denominated TES showed lower valorizationsthan peso-denominated TES due to downward inflation expectations. In addition, Colombian peso-denominated securities generally had higher valuations than their regional peers in all maturities, second only to Brazilian securities.

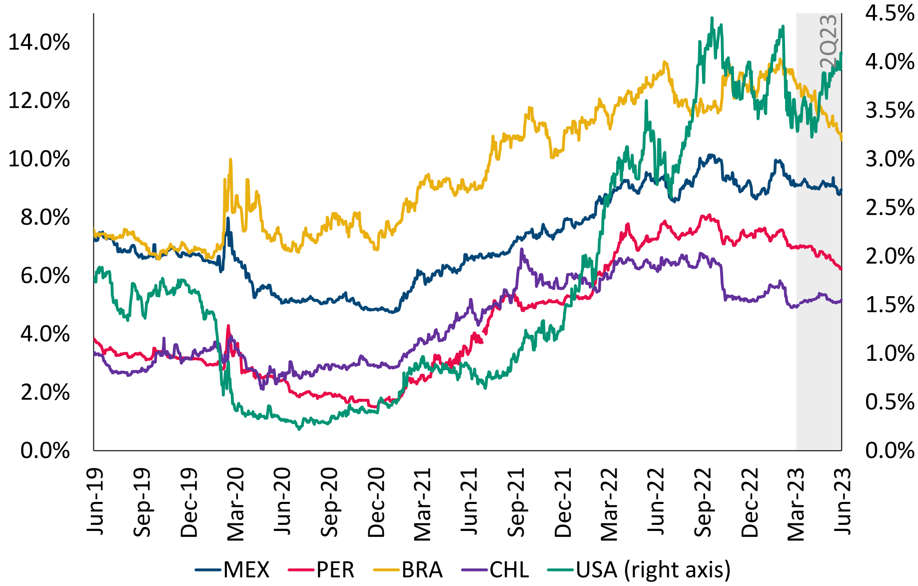
Graph 27. Regional and U.S. 2-Year Zero-Coupon Rates



Source: Bloomberg and *Banrep*.

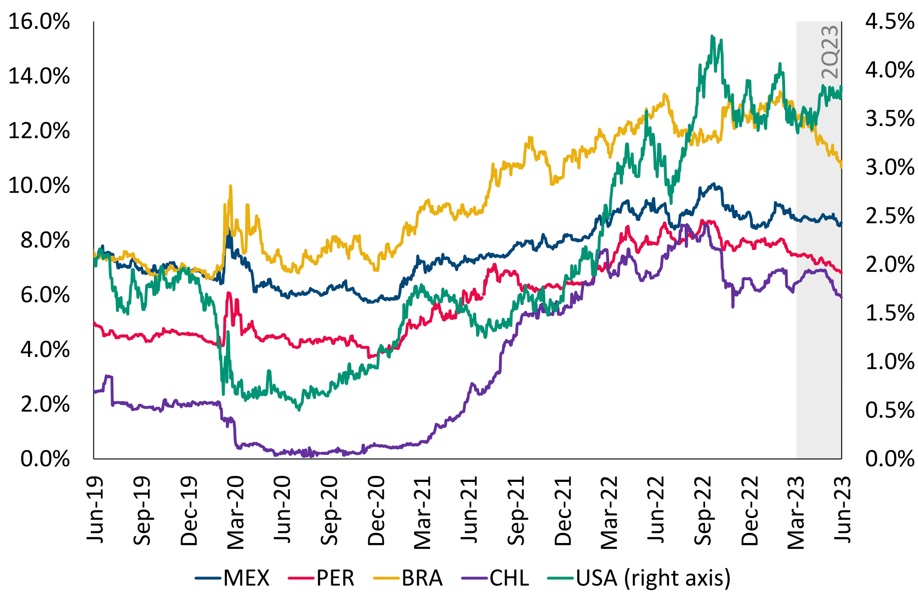
[22] i) In Mexico, valuations could have been contained by the hawkish stance of its central bank; ii) In Chile, the yield curve rose amid high volatility in copper prices and expectations that the central bank will begin the rate cut cycle in the coming months; iii) In Brazil, appreciation due to expectations of rate cuts may have been contained by fiscal uncertainty and tensions between the Central Bank and the Government; and iv) In Perú, appreciation occurred, despite the decline in copper prices, amid greater perception of political stability in the country and lower inflationary pressures.

Graph 28. Regional and U.S. 5-Year Zero-Coupon Rates



Source: Bloomberg and *Banrep*.

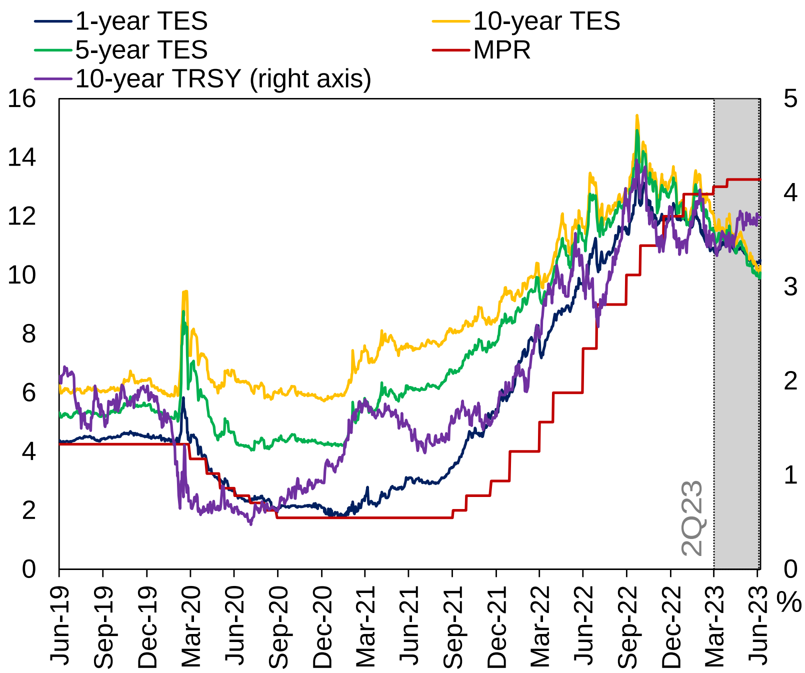
Graph 29. Regional and U.S. 10-Year Zero-Coupon Rates



Source: Bloomberg and *Banrep*.

In addition, the slope yield curve in pesos is at all-time low and is close to a possible inversion. In the short-term, the appreciation was associated with expectations that *Banrep* will not increase rates further due to the inflation data that surprised on the downside during 2Q23, the decline in inflation expectations, and the inflation risk premium (See Box 1: Factors that may influence the resistance of the yield curve in Colombia to invert). On the other hand, the middle and long end of the curve were more favored by an increased appetite for risk assets at the international level and a significant demand from local agents for TES[23].

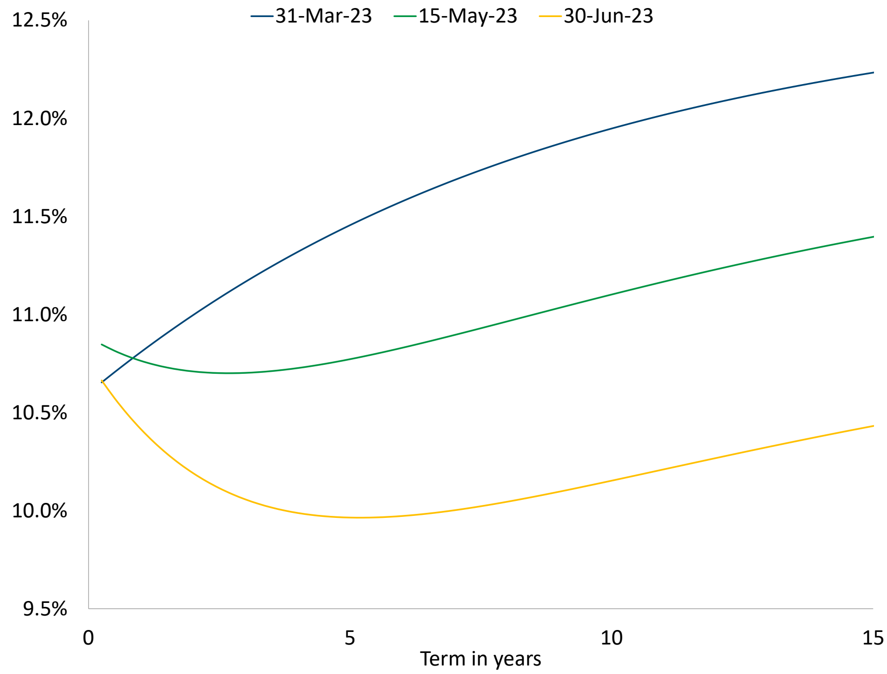
Graph 30. TES Zero-Coupon Rate in Pesos and *Banrep's* Benchmark Rate



Source: Bloomberg, *Banrep*.
TRSY corresponds to 10-year U.S. Treasuries.

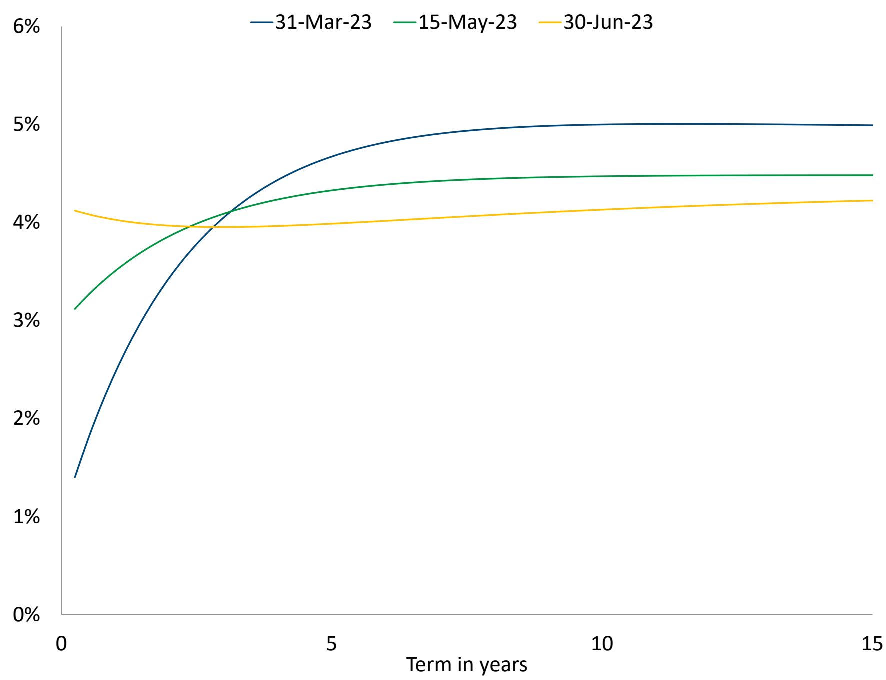
[23] In 2Q23, there were TES maturities for about COP 3.6 trillion and TES coupon payments of COP 2.3 trillion.

Graph 31. Spot Curve in Pesos, Colombia



Source: *Banrep*.

Graph 32. Spot Curve in UVR, Colombia



Source: *Banrep*.

Despite the favorable behavior of TES, and in an environment of improved market volatility[24], foreign investors accentuated their pace at which they are **selling local currency public bonds.** These agents sold COP 4,104 billion in peso-denominated TES and bought COP 1,659 in UVR-denominated TES in the spot market in 2Q23.[25]. So far this year, they have accumulated sales of COP 3,564 billion[26] and COP 414 billion [27] of peso-denominated TES and UVR-denominated in the spot market, respectively. These are the highest cumulative sales for the beginning of the year since 2014. These sales could be associated with some local risk factors (See Risk Perception at the local level), with profit taking and sales by passive investors to keep their exposure stable given the accumulated increase in prices of Colombian securities during the year.

By type of foreign investor, there was a recomposition towards agents with a less stable position (e.g., mutual funds), due to greater outflows of international pension funds. International pension funds have been the main sellers during 2023, followed by monetary authorities, with net sales of COP 4,359 billion and COP 969 billion respectively[28] (Graph 33).

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[24] In 2Q23, the average conditional volatility, measured through GARCH models (1.1), of the 1, 5, and 10-year peso TES zero-coupon rates decreased compared to the 1Q23 average.

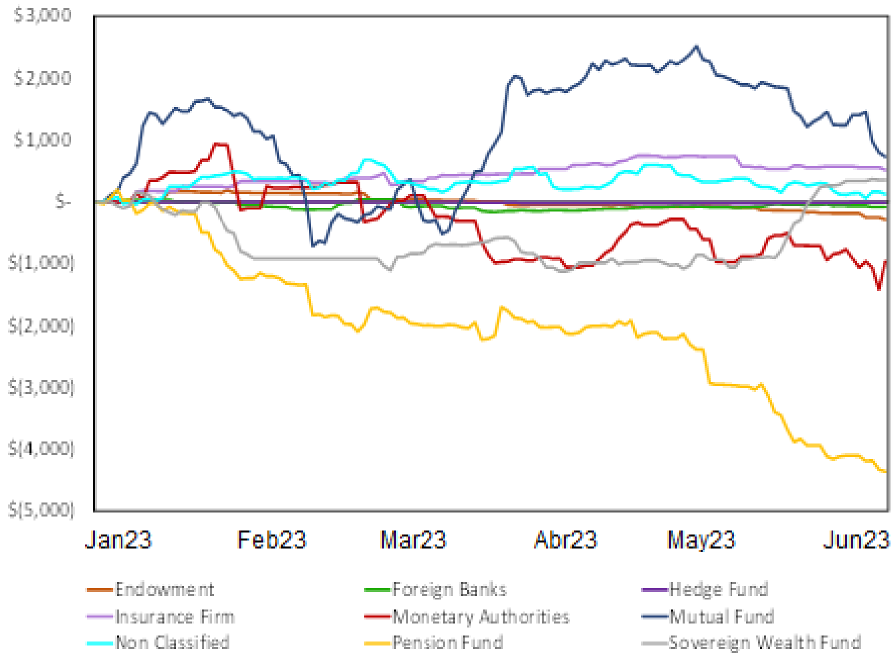
[25] In April, they registered net flows of COP 892 billion and COP 269 billion TES in pesos and UVR, respectively. In May, COP -2,280 billion and COP 298 billion. Finally, in June, for COP -2,715 billion and COP 1,092 billion. In 2Q23, foreign investors reduced their buying position in Non-Delivery Forward (NDF) contracts by COP 2,865 billion and COP 387 billion, TES in pesos and UVR, respectively. A forward contract is a derivative financial instrument in which the parties agree to buy or sell an asset in the future, in this case, a TES, at a price fixed on the contract's trade date. In forward contracts with Non-Delivery Forward (NDF) settlement, settlement is by offsetting, that is, at maturity, the market price (or rate) is compared against the agreed price (or rate). In the event that the market price is higher, the contract buyer receives the differential between the two prices multiplied by the nominal or vice versa. This instrument allows foreign investors to take positions in TES without directly purchasing the TES asset.

[26] During 2023, foreign investors have reduced their position through Non-Delivery Forwards (NDF) contracts of TES denominated in COP 980 billion.

[27] During 2023, foreign investors have reduced their position through Non-Delivery Forwards (NDF) contracts of TES denominated in UVR by COP 871 billion.

[28] With information as of 30 June, endowment funds recorded sales amounting to COP 291 billion, foreign banks to COP 81 billion, and hedge funds to COP 11 billion. The unclassified showed purchases for COP 123 billion, sovereign wealth funds for COP 351 billion, insurance companies for COP 511 billion, and mutual funds for COP 746 billion. As for TES in pesos, sales were mainly in international pension funds (COP -4,266 billion). Sovereign wealth funds, endowment funds, monetary authorities, hedge funds, multilateral organizations, foreign banks, unclassified, insurance companies, and mutual funds showed net flows in TES in pesos of COP -757 billion, COP -310 billion, COP -220 billion, COP -11 billion, COP 4 billion, COP 91 billion, COP 174 billion, COP 443 billion, and COP 1291 billion, in that order. Sales in TES UVR were mainly in the monetary authorities (COP -748 billion). Mutual funds, foreign banks, international pension funds, unclassified funds, endowment funds, insurance companies, and sovereign wealth funds had net flows in UVR TES for COP -545 billion, COP -172 billion, COP -93 billion, COP -51 billion, COP 20 billion, COP 68 billion, and COP 1,108 billion, respectively.

Graph 33. Cumulative Flows in 2023 by Type of Foreign Investor in the TES Spot Market (COP Billions)



Source: *Banrep*.

Despite the above, foreign investors remain the second largest holders of TES, behind local pension fund managers.[29]. These managers have made significant purchases of these securities so far this year (COP 15.8 trillion), partially offsetting the outflows of foreign investors (Graph 34). These purchases are concentrated in long end references of the curve, both peso-denominated TES and UVR-denominated (COP 17.5 trillion and COP 3.3 trillion, respectively).

In line with the behavior of Treasuries, the external public debt bonds of both Colombia and its peers depreciated during 2Q23, so these countries continue to face a high financing cost. However, spreads between the region's sovereign securities in dollars and Treasuries declined. Graph 35 shows the difference between Colombia's Global Bond yields and 10-year Treasury yields. In 2Q23, this spread decreased by 17 bps and continued to hover around 400 bps, a value that has been around since 4Q22[30], indicating a high financing cost for the Government.

In this context, the Government's ability to access the required funding has not been affected[31]. According to the IMF, high indexation at variable rates, external currency, and short maturity are

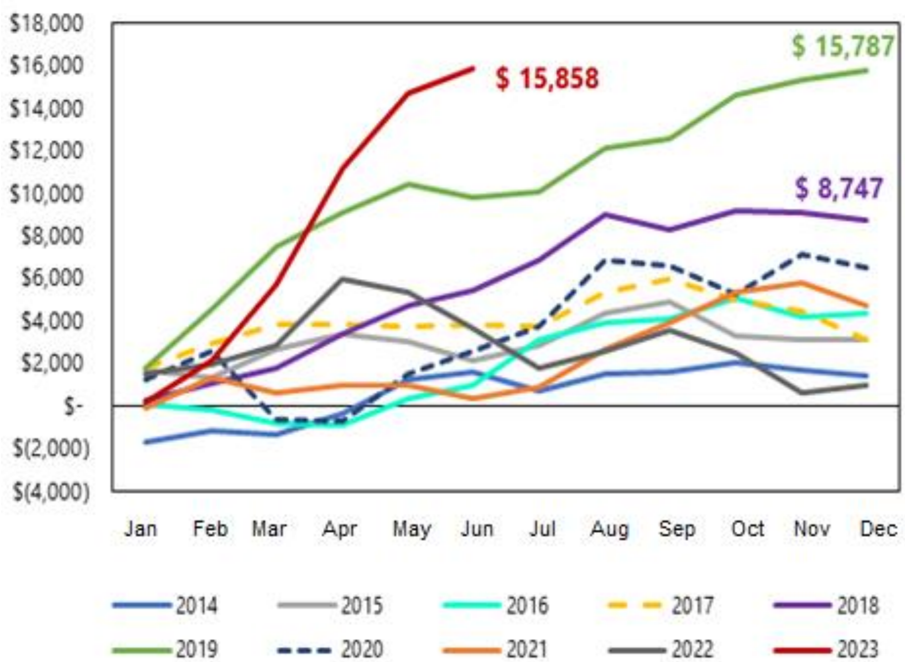
[29] Foreign investors' participation in outstanding peso-denominated TES went from 35.0% to 33.4%, while UVR-denominated TES went from 5.4% to 6.11% during 2Q23. Within the total TES balance, it went from 25.2% to 24.2%.

[30] After having experienced an upward trend between 2021 and 2022, as a result of the increase in the risk perception to Colombia and inflationary pressures.

[31] The average Bid-to-Cover of TES primary auctions during 2022 was 2.4 times the amount originally auctioned. So far in 2023, this indicator has averaged around three times.

factors that could restrict the debt servicing capacity of emerging economies and cause increases in their financing cost through higher spreads. This risk is higher for Colombia in the next five years since it has a higher concentration of debt maturities (Graph 37). However, the exposure to variable rates and foreign currency showed a drop during 2Q23[32] compared to the upward values they had been registering in previous periods (Graph 36 and Graph 37). Likewise, the exposure of public external debt to variable rates is below the levels of the aggregate of emerging and developing countries[33].

Graph 34. Cumulative Net Purchases per Year of Pension and Severance Funds (FPCs) in the TES Spot Market (billions)

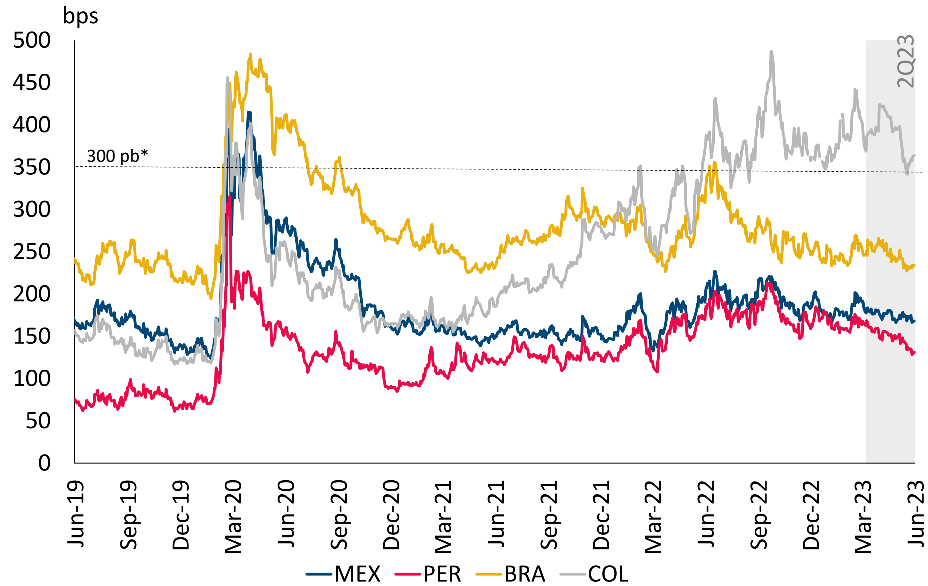


Source: *Banrep*.

[32] The Central National Government's total debt exposure to variable rates and foreign currency is at levels of 37.8% and 6.4%, respectively, for 2Q23.

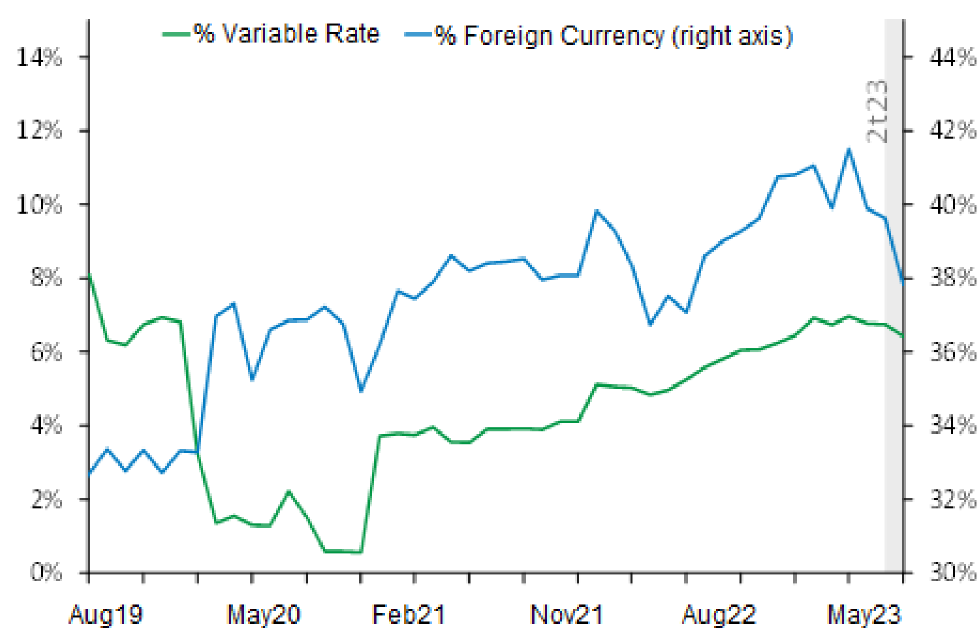
[33] The percentage of the Central National Government's external debt to a variable rate is 17% for 2Q23, while in the April 2023 World Economic Outlook, the IMF reports that the external debt exposure of the emerging countries' aggregate to a variable rate is 33%. In dollars, Colombia's public external debt exposure is 89%, a level around which it has remained stable since April 2021, while for the aggregate of emerging countries, it is 65%.

Graph 35. Treasury Spread - 10-Year Global Bonds



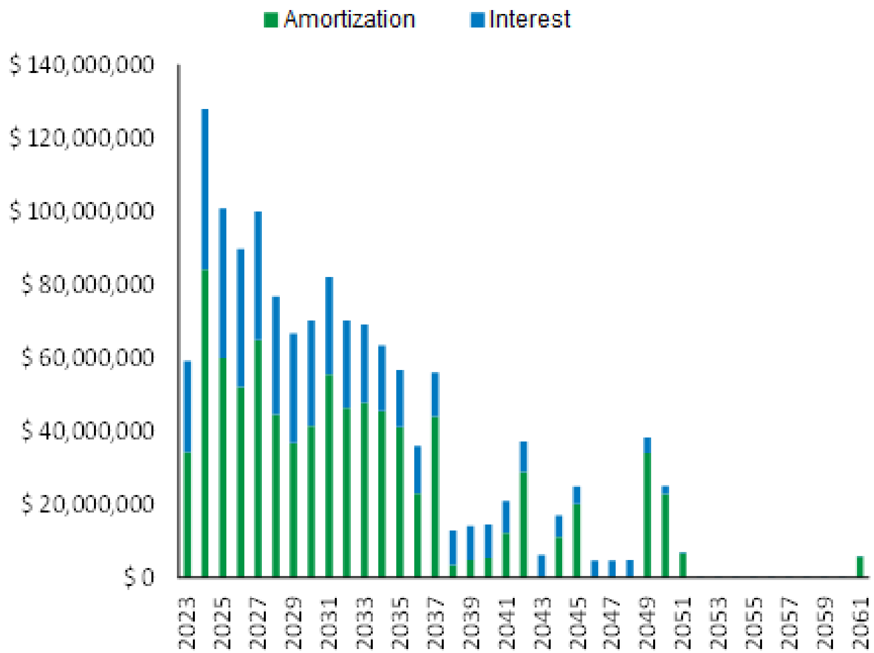
Source: Bloomberg.
The dotted line corresponds to one of the three thresholds used by the IMF to characterize the level of stress in the cost of debt funding. These correspond to 300 bps (moderately stressed), 700 bps (stressed), and 1,000 bps (highly stressed).

Graph 36. Composition by Rate and Currency of the Central National Government Debt



Source: Ministry of Finance and Public Credit

Graph 37. Maturity Profile of the Central National Government Debt (COP Billions)



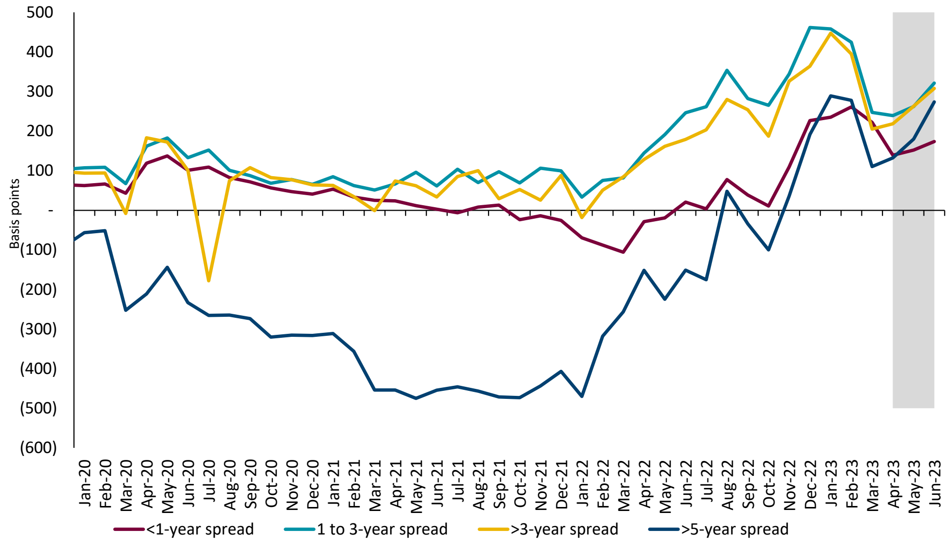
Source: Ministry of Finance and Public Credit

5.4. Private Debt Market

During the quarter, the funding costs for banks through CDTs were on average lower than in the first quarter of the year. This was reflected in a lower average spread between CDTs[34] and TES rates (*Graph 38*). The cost of funding through CDTs corrected downwards in April following the behavior evidenced in March in line with the appreciation of TES and in an environment of greater liquidity, and subsequently increased slightly. This upward trend may partly be due to COP$ liquidity conditions (see Colombian Money Market).

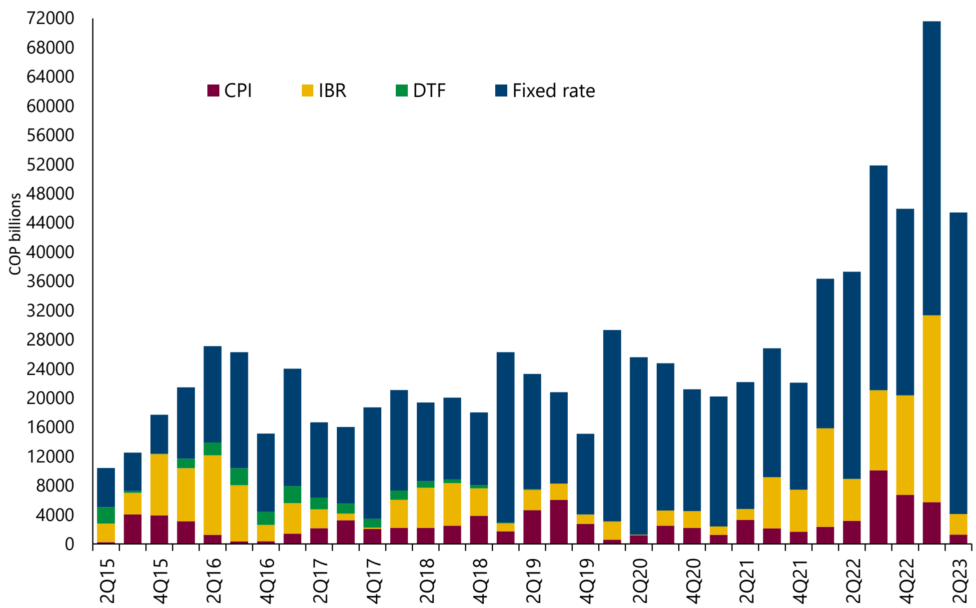
[34] This analysis considers only the issuance rates of fixed-rate CDTs in COP deposited in Deceval (Centralized Securities Depository of Colombia).

Graph 38. Spread (bps) between CDT and TES Rates



During the period, there was a decrease in the amounts placed in CDTs, compared to 1Q23.[35]. This behavior resulted mainly from lower placements of securities indexed to IBR and CPI, which had a participation of 6.0% and 3.0% of total placements in the quarter, respectively[36] (Graph 39).

Graph 39. Amounts (COP Billions) Placed in Dematerialized CDTs by Type of Rate



[35] Only dematerialized CDTs deposited in Deceval and with valuation information in Precia are considered.

[36] In the previous quarter, placements indexed to IBR represented 36% of the period placements, while those indexed to CPI represented 8.0%.

Additionally, funding through private bond placements has continued with low dynamism and, along with this, no placements were made through the Colombian Stock Exchange (BVC in Spanish) during the second quarter of the year.

6. Foreign Exchange Market

6.1. Global Foreign Exchange Market

The U.S. dollar was volatile and closed slightly higher than the end of the previous quarter, continuing at historically high levels (according to the DXY index[37], the dollar appreciated marginally by 0.4%). Some factors that guided its variability were the changes in expectations regarding the magnitude of monetary tightening by the Federal Reserve (Fed), which increased compared to the end of the previous quarter, expectations of a more contractionary monetary policy by the central banks of other developed economies, and some specific risk aversion events[38] (see International Environment, Table 3, and Graph 40).

Table 3. Currency Depreciation against the U.S. Dollar

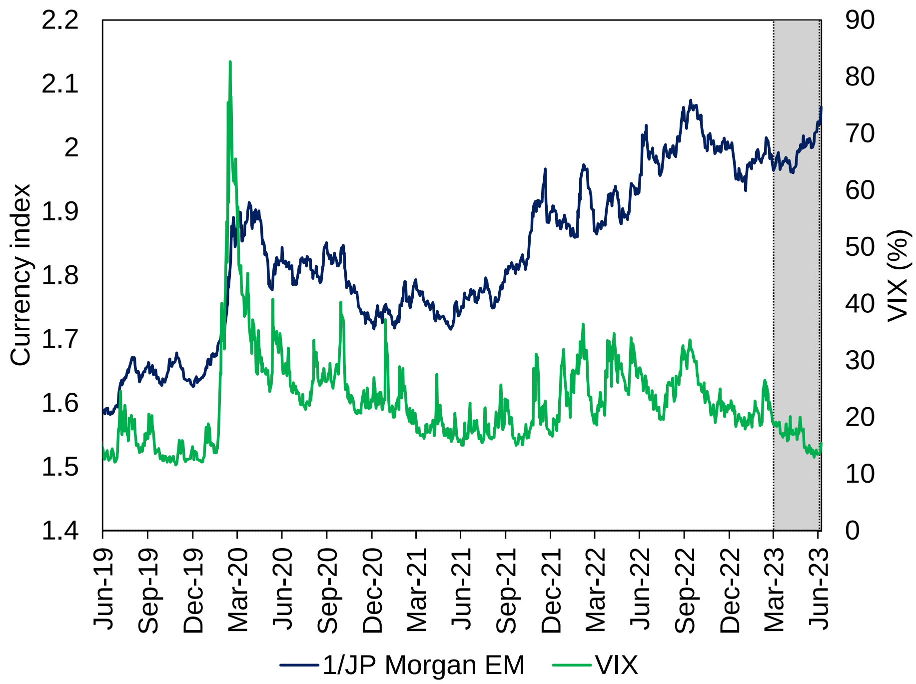
	Country	1Q23	2Q23		Country	1Q23	2Q23
LATIN AMERICA	Colombia	-3.4%	-10.1%	ASIA	Korea	3.3%	1.3%
	Brazil	-4.2%	-5.5%		Indonesia	-3.7%	0.5%
	Mexico	-7.5%	-5.1%		Thailand	-1.3%	3.3%
	Argentina	18.0%	22.8%		China	-0.4%	5.5%
	Perú	-1.1%	-3.7%		India	-0.7%	-0.2%
	Chile	-6.5%	0.9%		Malaysia	0.2%	5.7%
MAJOR CURRENCIES	Euro Zone	-1.2%	-0.6%		Hong Kong	0.6%	-0.2%
	Great Britain	-2.1%	-2.9%	OTHER	Iceland	-3.0%	-0.8%
	Japan	1.3%	8.6%		Russia	4.8%	14.9%
	Canada	-0.3%	-2.0%		Poland	-1.3%	-5.9%
	Australia	1.9%	0.3%		Turkey	2.5%	35.6%
	New Zealand	1.5%	2.2%		Israel	2.3%	3.1%
	Switzerland	-1.0%	-2.1%		South Africa	4.5%	5.9%

Source: Bloomberg, Data License.
A positive value denotes a depreciation, and a negative value indicates an appreciation.

[37] Index comparing the U.S. currency with six major currencies. The euro (EUR) weights 57.6%; the Japanese yen (JPY) 13.6%; the pound sterling (GBP) 11.9%; the Canadian dollar (CAD) 9.1%; the Swedish krona (SEK) 4.2%, and the Swiss franc (CHF) 3.6%.

[38] In the face of the concerns about an economic slowdown in China following the release of weak Chinese data (slower export growth and a significant drop in imports, as well as weak inflation results for April) and initial uncertainty regarding of the U.S. debt ceiling negotiations.

Graph 40. VIX and an Index to Track Emerging Currency Dynamics



Source: Bloomberg, Data License.
The JP Morgan EM index is exhibited as 1/index because an increase in the original series indicates an appreciation. Thus, an increase in the 1/index series indicates a depreciation of its basket of currencies.

Some developed economies' currencies appreciated, supported by expectations of higher interest rate increases by the central banks of these countries (United Kingdom and Eurozone). Thus, the pound sterling and the euro appreciated by 2.9% and 0.6%, respectively. Meanwhile, the yen depreciated due to some *dovish* comments by the governor of the Bank of Japan [39].

Emerging country currencies showed a mixed performance amid a decline in some commodity prices, the Chinese government's decision to take measures to support the real estate sector and some idiosyncratic factors. Most Latin American currencies performed favorably compared to the group of emerging market[40] and the strengthening was led by the Colombian peso, which appreciated influenced by some external and local factors (Graph 41). The following are the main idiosyncratic factors that may have influenced the performance of the region's currencies:

---

[39] In early April, Bank of Japan Governor Kazuo Ueda stated that the negative interest rate and the ceiling on the 10-year sovereign bond rate were appropriate measures in the economic context. Subsequently, by the end of June, he assured that the expansionary monetary policy needs to be sustained, as core inflation remains below target.

[40] Supported by local factors and possibly by a recent decline in inflation, analysts consider that inflation has already peaked and expect interest rates to remain elevated for a longer period before starting to decline.

The Brazilian real appreciated mainly supported by: *i)* a reduction in inflation forecasts and an increase in the growth estimate for 2023 (according to the Focus weekly survey); and *ii)* following the National Monetary Council's decision to maintain the inflation target at 3.0%[41]. In this context, Standard & Poor's upgraded its long-term outlook from “stable” to “positive”[42] by justifying a better-than-expected GDP growth trajectory and signs of stability in the government’s fiscal and monetary policies

The Mexican peso strengthened, and the exchange rate reached a more than seven-year low. The Central Bank's hawkish message favored the currency following its June meeting[43]. On the other hand, according to analysts, the Mexican market continues attracting foreign investors due to its high carry, low volatility, ample liquidity, and proximity to the U.S. market in a scenario of readjustment of global supply chains.

The strengthening of the Peruvian sol may have been supported by a decrease in political uncertainty. The above was after the president, Dina Boluarte, announced that she plans to remain in office until 2026, which suggested political stability to the market.

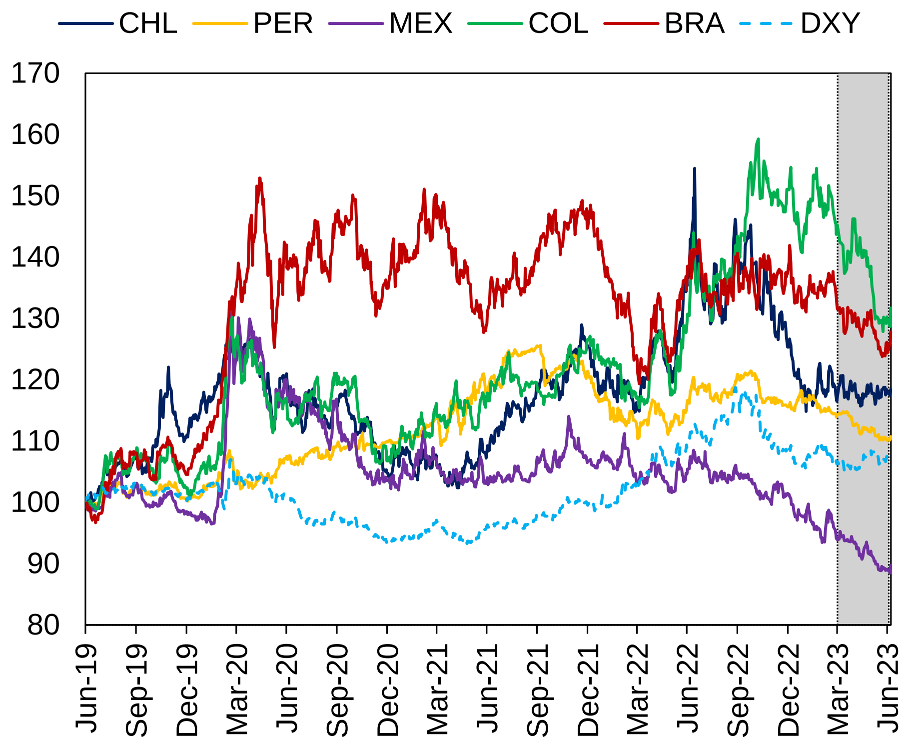
Finally, unlike its regional peers, the Chilean peso depreciated marginally by 0.9%. The peso weakened in a context in which the Central Bank of Chile (BCCh) decided to gradually reduce its foreign exchange transactions program through *Non-Delivery Forward* (NDF) and suggested that it could soon start a downward policy rate cycle, as economic conditions are evolving as expected.

[41] This showed signs of credibility and stability of the country's economic policy, even though the president had criticized the target and described it as strict and challenging to achieve.

[42]In addition, it maintained its long- and short-term local and foreign currency sovereign credit ratings at BB-/B.

[43] Banxico indicated that it will keep rates high for a long period to control inflation, despite the fact that the price index has shown moderation

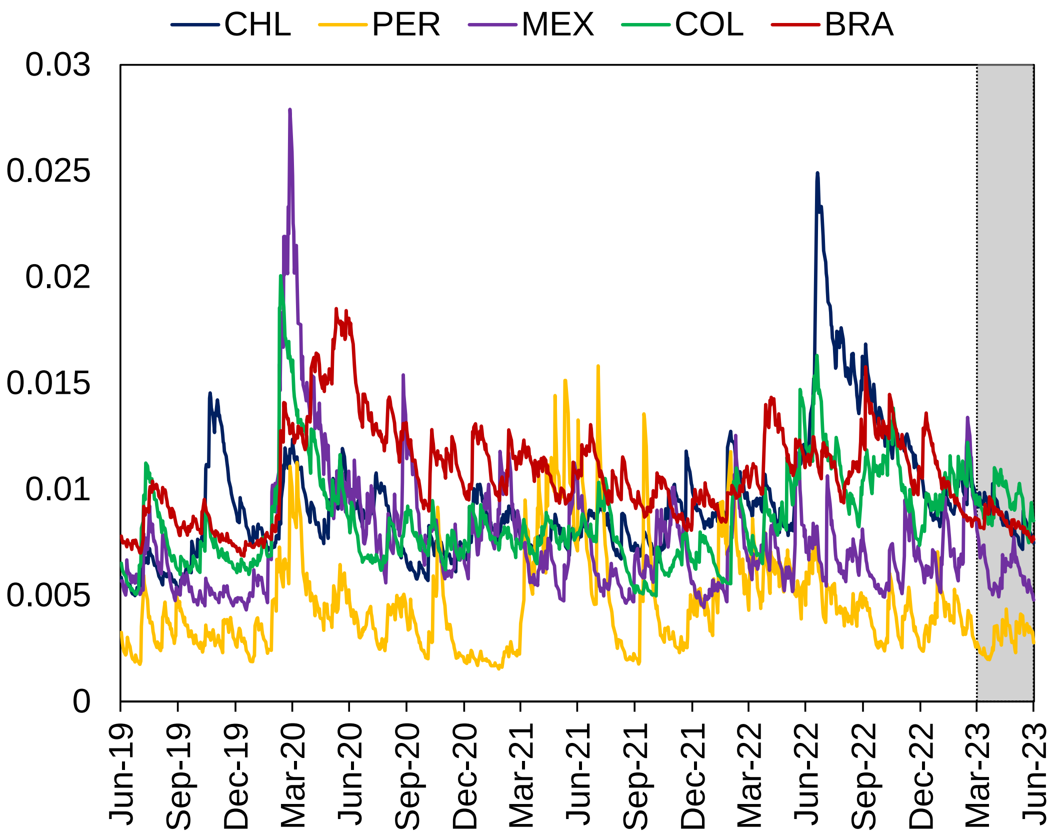
Graph 41. Latin America and U.S. Dollar Exchange Rates



Source: Bloomberg.

Average conditional volatility decreased for all the region's currencies analyzed, especially during the last month. During the quarter, the Colombian peso had the highest average volatility, followed by the Chilean peso, the Brazilian real, the Mexican peso, and the Peruvian sol. For most of the period, the volatility of the Colombian peso maintained a positive differential against its pairs. This is not a common behavior of the local currency for the period under analysis and the most recent information shows a correction trend in this difference, which in any case did not reach historically high levels (Graph 42).

Graph 42. Conditional Volatility of Latin American Exchange Rates



Source: Bloomberg, Data License. DOAM calculations.

The central banks of the main Latin American economies analyzed have inflation targeting and flexible exchange rate policy schemes, accompanied by occasional foreign exchange market interventions to meet their policy objectives. Accordingly, in the quarter, the Central Banks of Chile, Perú, Brazil, and Mexico carried out operations in the foreign exchange market through different mechanisms, continuing with the behavior they have been showing in recent quarters.

In Brazil, *Banco Central do Brasil* (the Central Bank of Brazil - BCB) had a purchasing position through Non-Delivery Cross Currency Swaps for US$458 million and reduced dollar liquidity through FX-Repos and Cross-Currency Swaps (CCS) for US$4,500 million (Table 4).

Table 4. BCB's Foreign Exchange Intervention (net purchases including maturities)

	Net spot purchases (A)*	FX-repos and CCS (B)**	Repos with dollar-denominated securities (C)***	Non-Delivery Cross-Currency Swaps (D)****	Total change in foreign exchange position (A + D)*****
2022	- 571	- 11,500	-	- 18,545	- 19,116
1Q23	-	8,500	-	796	796
April	-	2,500	-	- 391	- 391
May	-	1,000	-	- 745	- 745
June	-	1,000	-	1,594	1,594
2Q23	**-**	**4,500**	**-**	**458**	**458**

Source: BCB website. Figures in US$ Millions. Maturities and renewals of instruments are included.

*Spot transactions consider the settlement date of the foreign currencies (t+2 regarding the day of the auction).
** FX-repos are denominated by BCB as credit line auctions or FX repo, while CCS are denominated as variable rate credit line auctions; these mechanisms have a temporary effect on the level of foreign reserves.
***This mechanism temporarily alters the level of foreign reserves.
****Denominated by BCB as FX-interest rate swaps or FX swaps; this mechanism has no effect on the level of foreign reserves.
***** CCS in column B are not considered in the result of the foreign exchange position because it is impossible to disaggregate the amount of these instruments.

The Central Bank of Perú (BCRP in Spanish) had a purchasing position through a Non-Delivery Cross Currency Swap for US$1,306 million and a selling position through Resettable Certificates of Deposit (CDR in Spanish) for US$16 million (Table 5).

Table 5. Central Bank of Perú's foreign exchange intervention (net purchases including maturities)

	Net spot purchases (A)	Non-Delivery Cross-Currency Swaps (B)*	CDR's (C)**	CDL's (D)***	Total change in foreign exchange position (A + B + C + D)
2022	- 1,236	- 239	341	-	- 1,134
1Q23	- 1	- 32	-	-	- 33
April	-	864	- 16	-	848
May	-	- 17	-	-	- 17
June	-	459	-	-	459
2Q23	**-**	**1,306**	**- 16**	**-**	**1,290**

Source: BCRP websites. Figures in US$ Millions. Maturities and renewals are considered.
*Denominated by BCRP as Foreign Exchange Swaps for Sale (or Purchase). It does not affect the level of foreign reserves.
** CDR's: BCRP's Resettable Certificates of Deposit.
*** CDL's: BCRP's Certificates of Deposit Payable in dollars. It has a temporary effect on BCRP reserves.

The Central Bank of Chile (BCCh in Spanish) began the process of gradually reducing its selling position in the Non-Delivery Forward (NDF) market as announced in April[44]. Accordingly, it had a purchasing position of US$2,400 million in this market. In addition, it started the implementation of a new reserve replenishment and expansion program to strengthen the country's international liquidity position by up to US$10,000 million.[45]. The above, considering that the BCCh interventions led to a decrease in foreign reserves and the current context in which BCCh believes that the country's foreign exchange and financial market are operating normally. Thus, the BCCh bought US$480 million in the spot market during the quarter (Table 6).

[44] On 21 April 2023, the BCCh announced that, starting April 24, it would begin to gradually reduce its selling position in the NDF market through a partial maturity renewal scheme, with an average daily reduction of US$50 million.

[45] The program was announced on June 9, where the BCCh informed that it would be carried out through daily auctions of US$40 million for 12 months.

Table 6. BCCh's Foreign Exchange Intervention (net purchases including maturities)

	Net spot purchases (A)	FX-repos (B)*	NDF forward sales (C)	Total change in foreign exchange position (A + C)
2022	6,150.0	-	9,110.0	- 15,260.0
1Q23	-	-	-	-
April	-	-	214.0	214.0
May	-	-	1,155.0	1,155.0
June	480.0	-	1,031.0	1,511.0
2Q23	**480.0**	**-**	**2,400.0**	**2,880.0**

Source: BCCh websites. Figures in US$ Millions. Includes maturities and renewals of transactions.
*The BCCh refers to this instrument as foreign exchange swap purchases. Temporarily alters the level of reserves.

6.2. Colombian Foreign Exchange Market

The Colombian peso led the strengthening of the currencies of the region and other emerging countries analyzed, appreciating 10.1%.[46] **influenced by local and some external factors.** According to market agents, the currency appreciation was supported by: *(i)* foreign currency supply flows in the spot market related to the inflow of foreign direct investment and the payment of taxes by large taxpayers; *(ii)* a correction movement, since the local currency had been punished and its performance had been lagging behind that of others in Latam; and *(iii)* a positive perception regarding the strength of local institutions, which have played an important role in the review and discussions of the reforms proposed by the government and a lower sovereign risk perception (decrease in CDS).

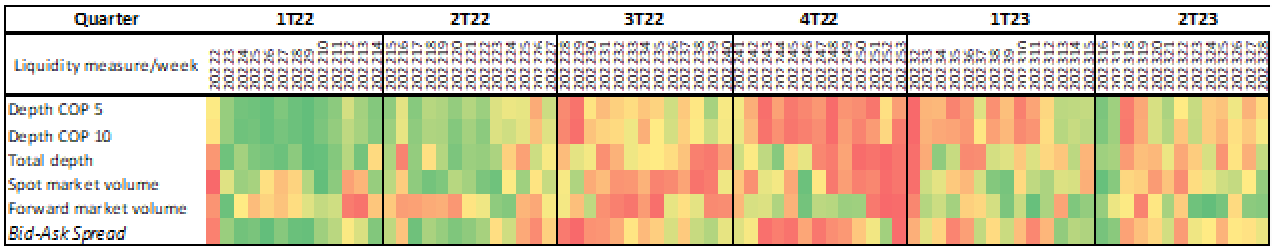
Despite the significant appreciation, there is still a relative weakness of the Colombian peso when comparing the dynamics of this currency with others in the region over a longer time horizon. When analyzing the period from the end of 2021 to the end of June 2023, the Colombian peso has accumulated a depreciation of 5.0%, while the foreign currencies of other countries in the region have appreciated [47]. This still lagging performance of the Colombian peso compared to its peers in the region can be explained by some domestic factors that have generated depreciation pressures, mainly the performance of the country's risk premiums spread and factors associated with local uncertainty.

[46] This variation is calculated taking into account the average SET-FX rate. Considering the closing rate in this system, the Colombian peso shows an appreciation of 10.3%.

[47] From 30 December 2021 to 30 June 2023, the BRL, MXN, CLP, and PEN showed variations of -14.0%, -16.3%, -5.8%, and -9.1%, respectively, against the U.S. dollar.

In this context, during the quarter there was an improvement in liquidity levels and a marginal decrease in volatility. In line with the above, the liquidity measure Bid Ask Spread (BAS)[48] decreased during the period, while the depth indicators at COP 5, COP 10, and total[49] increased compared to 1Q23[50]. Likewise, the average daily amount traded in the forward market increased compared to the previous quarter and reached US$3,705 million, hitting an all-time high, while the average amount in the spot market[51] (US$1,620 million) remained at similar levels to those observed in 1Q23 (Graph 43).

Graph 43. Foreign Exchange Market Liquidity Measures



Source: Bloomberg, *Banco de la República*.

Note: Each data point corresponds to the percentile of the weekly average of the liquidity measure, taking into account the time window from January 2022 to June 2023. A red (green) cell indicates a lower (higher) level of liquidity. The Bid Ask Spread is calculated as the average of the difference between the best bid price and best ask price in the Set-FX spot session for each second between 8:30 a.m. and 1:00 p.m., each day, divided by the average Set-FX rate of the day. The depth measures correspond to the average of the sum of the amounts of the purchase quotes and the sum of the amount of the sales quotes of the peso-dollar, which are in a range of -/+ COP 5, -/+ COP 10, and the total of the best bid/ask price, accordingly. The information is extracted from the Set-FX spot session every 5 minutes between 8:30 a.m. and 1:00 p.m.

Exchange rate forwards cleared at the Central Counterparty Risk Clearing House of Colombia S.A. (CRCC in Spanish) (US$42.5 billion) decreased during the period. In addition, there was a decrease

[48] The BAS is calculated as the average of the difference between the best bid price and the best ask price in the Set-FX spot session for each second between 8:30 a.m. and 1:00 p.m. each day, divided by the average Set-FX rate of the day.

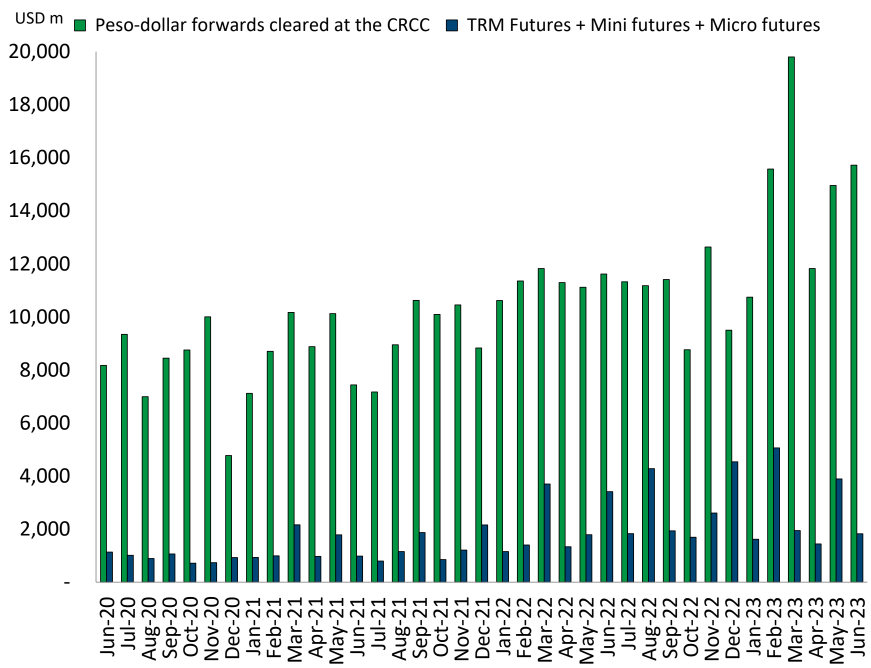
[49] The depth measures correspond to the average of the sum of the amounts of the purchase quotes and the sum of the amount of the sales quotes of the peso-dollar, which are in a range of -/+ COP 5, -/+ COP 10, and the total of the bid/ask price, accordingly. The information is extracted from the Set-FX spot session every five minutes between 8:30 a.m. and 1:00 p.m.

[50] In 2Q23, the BAS averaged 0.059%, while the depth measures at COP 5, COP 10, and total stood at US$6.6 million, US$12.5 million, and US$44.3 million, respectively. In 1Q23, the BAS averaged 0.063%, while the depth measures at COP 5, COP 10, and total stood at US$5.2 million, US$10.1 million, and US$43.5 million, respectively.

[51] Includes transactions between Foreign Exchange Market Intermediaries (FXI) and transactions between FXI and their clients.

in the trading volume of most standardized exchange rate derivatives compared to what was observed in 1Q23[52] (Graph 44).

Graph 44. Exchange Rate Derivatives Cleared at the CRCC



Source: CRCC and *Banrep*.

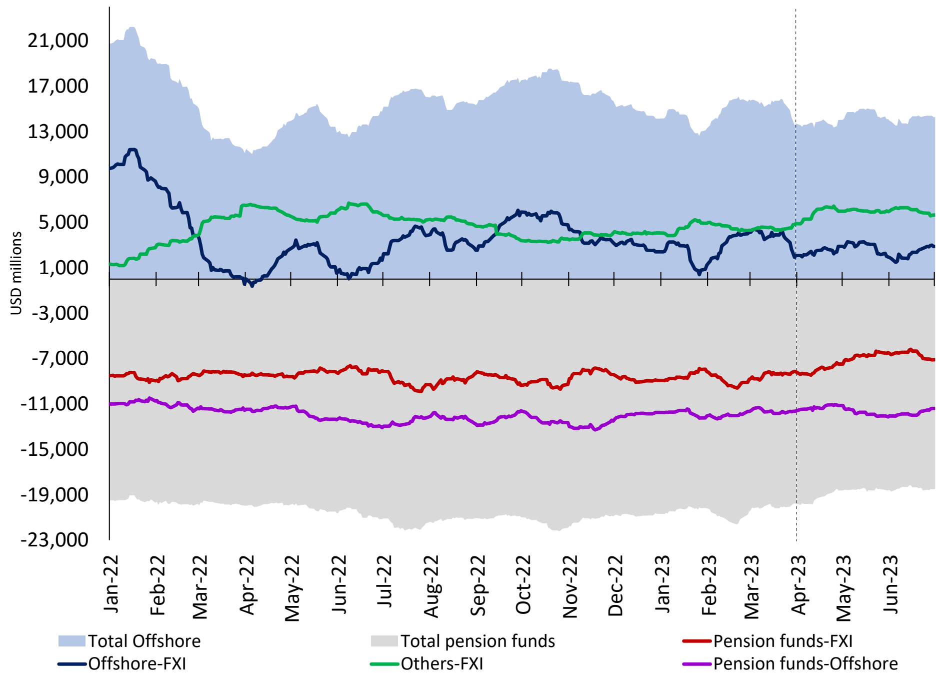
Regarding the positions of the different agents in the forward market, in 2Q23, foreign investors, Pension and Severance Funds (FPCs in Spanish), and non-financial companies had a net buying position in the peso-dollar forward market against FXIs. This resulted in an increase in the foreign investors' buying outstanding position[53] and a decrease in the FPCs’ selling outstanding position[54] (Graph 45).

[52] A total of 139,748 futures contracts on the official market exchange rate (TRM in spanish) were traded for a total amount of US$6,987 million (US$8,519 million in 1Q23). Two mini TRM futures contracts were traded for a total amount of US$0.01 million (US$57.4 million in 1Q23). In turn, 182 TRM options contracts (57 contracts in 1Q23) and 176,546 units of the exchange rate futures micro contract (TRX) were traded (US$53.2 million in 1Q23).

[53] The outstanding position corresponds to net purchases, including maturities of forward and swap operations, carried out between foreigners with FXIs and Pension and Severance Funds (FPCs).

[54] The balance corresponds to net purchases, including maturities of forward and swap operations, carried out between FPCs with FXIs and foreigners.

Graph 45. Net Purchase Balances of Peso-Dollar Forwards and Swaps



Source: Foreign Exchange Trading and Registration Systems.

In turn, hedging costs increased due to the demand from the different agents and the costs incurred by intermediaries to fund their operations. As a result of the demand for dollars in the forward market by the different agents, which led the Foreign Exchange Market Intermediaries to have a selling position, their cash holdings in dollars PPC in Spanish) increased during the quarter. This has been reflected in an increase in the spread between the implied and theoretical one-month depreciation[55] which surpassed the 99th percentile of the historical distribution[56]. However, in recent days the spread has corrected downwards (Graph 46).

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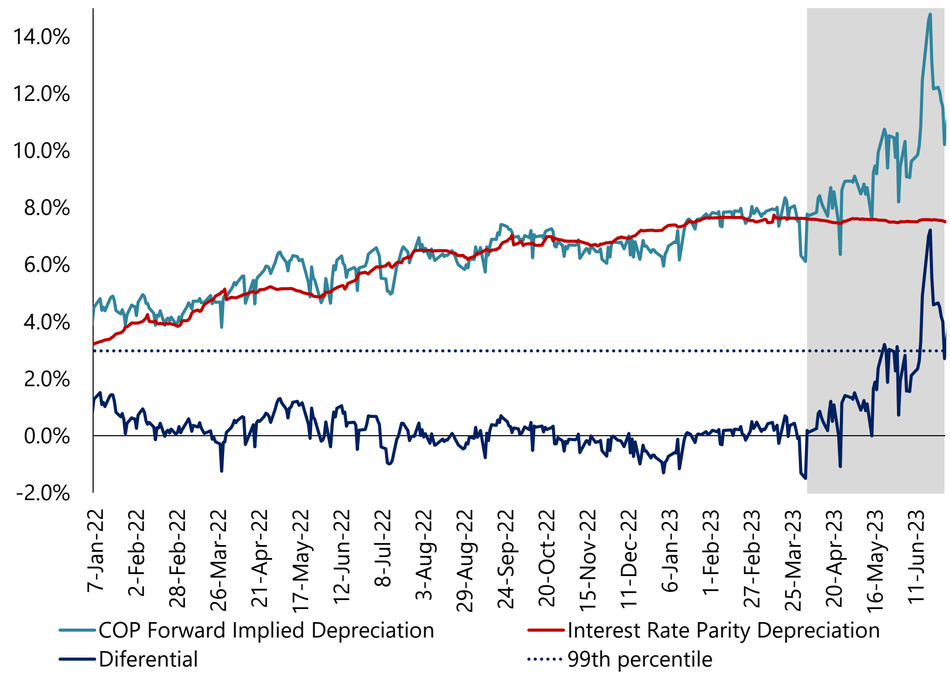
[55] The observed and theoretical depreciation used corresponds to the 15- to 35-day and one-month terms, respectively. The spread corresponds to the difference between the implied depreciation observed in forward contracts and the theoretical (interest rate parity) depreciation. The theoretical depreciation is calculated using the effective annual SOFR (i*) and IBR (i) rates for the one-month term $\left[\frac{(1+i)}{(1+i*)}\right]-1$. The implied depreciation is calculated as $\left[\frac{\text{forward rate}}{\text{spot rate}}\right]^{\frac{365}{term}}-1$ of one-month peso-dollar forward transactions reported by foreign exchange market intermediaries to the foreign exchange trading and registration systems and received by *Banco de la República*.

[56] Taking information from 02 January 2004 to 30 June 2023.

Graph 46. Implied (Observed), Theoretical One-Month Devaluation and its Difference



Source: Bloomberg and *Banrep*.
The theoretical depreciation is calculated using the SOFR and the one-month IBR.

7. Stock Market

In an environment of increased risk appetite and greater resilience of economic activity, global stock markets had a positive performance during the second quarter of 2023, following the good performance of the previous quarter. Thus, during the quarter, the U.S. market showed the highest appreciation (8.2%), followed by the Latin American, Asian, and European markets, with appreciations of 6.3%, 4.2% and 0.9%, respectively[57] (Graph 47).

During the quarter, in a context of lower risk perception, U.S. indexes benefited from favorable economic news and positive economic results from the technology and financial sectors. Companies such as Nvidia, Apple, and Microsoft, as well as the banks Citibank, Wells Fargo, and JP Morgan, reported positive corporate results (Graph 47).

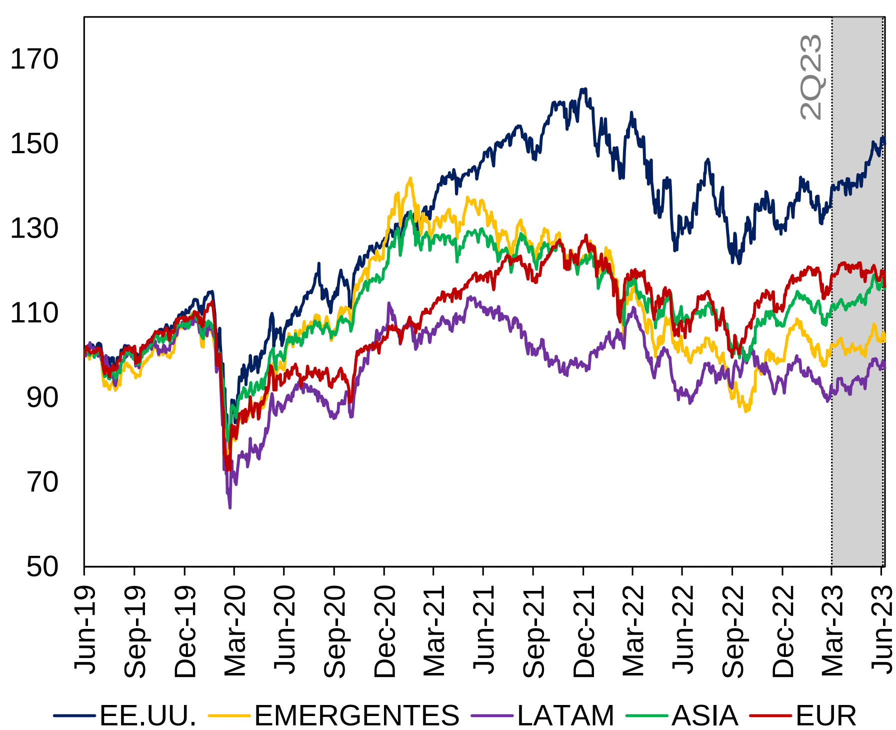
[57] As of 30 June 2023, these figures were calculated for Asian countries using the MSCI AC Asia Pacific Local Index (the countries and/or regions included in the index were both developed and emerging. The first group included Australia, Hong Kong, Japan, New Zealand, and Singapore. The second included China, India, Indonesia, South Korea, Malaysia, the Philippines, Taiwan, and Thailand). In the case of the United States, the average variation of the S&P 500, Dow Jones, and Nasdaq Composite indexes was used, registering variations of 8.3%, 3.4% and 12.8%, respectively. Meanwhile, the Stoxx 600 was used for Europe and the MSCI Emerging Markets Latin America Local Index for Latin America (as of 30 June 2023, this index weighted the equity assets listed on the stock markets of Brazil, Chile, Colombia, Mexico, and Perú).

The European Stoxx 600 index showed a marginal appreciation at the end of the quarter. During the quarter, the European stock market benefited from positive corporate results from companies in the mining and industrial sectors, and from expectations of Chinese economic stimulus policies. However, weak economic data from Germany, as well as the increase in interest rates, pressured the index downwards (Graph 47).

In Latin America, the main stock indexes showed mostly appreciation. Accordingly, the Brazilian, Chilean, and Peruvian stock markets rose 15.9%, 8.7%, and 2.0%, respectively, while the Mexican and Colombian markets fell of 0.7% and 2.1%, respectively (Graph 48).

Brazil's index showed its highest quarterly performance since the fourth quarter of 2020, influenced by the publication of favorable economic figures.[58] It also benefited from better growth and inflation forecasts, the improvement of the long-term outlook by Standard & Poor's,[59], and the approval in the Lower House of the fiscal framework bill. At the sector level, financial, energy, and industrial stocks were leading the gains, given their importance within the index, of nearly 50% (Table 7).

Graph 47. Evolution of Stock Indexes Worldwide



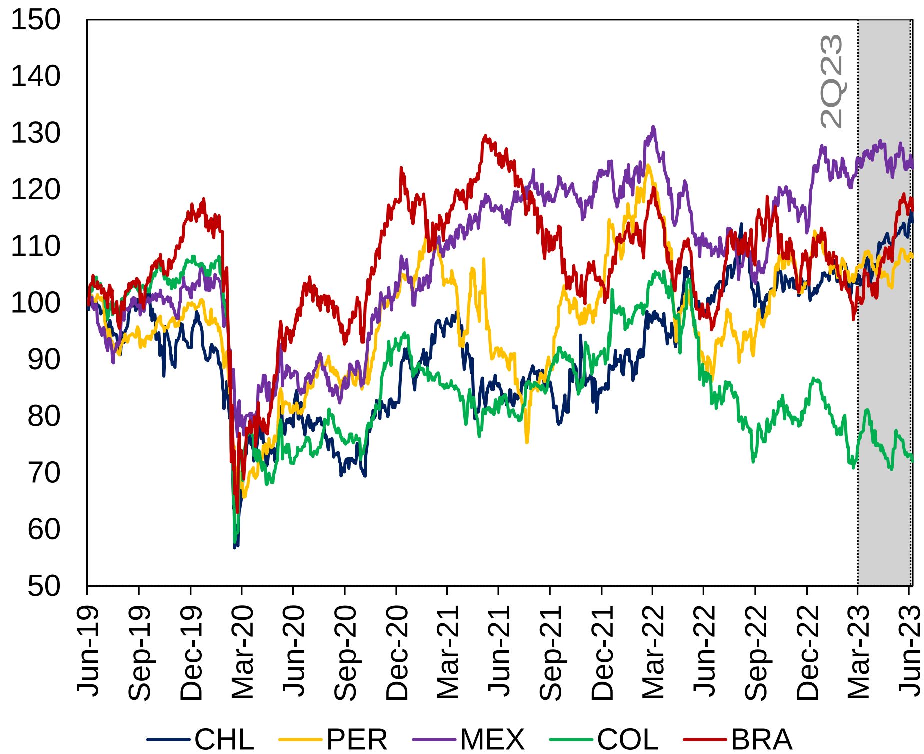
Source: Bloomberg, Data License.

[58] Among these are the publication of GDP, which grew by 1.9% in 1Q23 compared to the previous quarter and above market expectations (1.2%).

[59] On 14 June, Standard & Poor's upgraded its long-term outlook from "stable" to "positive".

The MSCI COLCAP Index (created by MSCI and BVC to measure the performance of the Colombian equity market) underperformed the equity indexes of its regional peers and displayed the opposite behavior to other local markets. This performance was influenced by the decline of financial stocks and in oil prices, in a low liquidity environment. (Table 7). During the quarter, liquidity continued to deteriorate, and on average, COP 53.5 billion were traded daily, marking the lowest quarterly level since the first quarter of 2008 (Graph 49).

Graph 48. Evolution of the Region's Stock Indexes



Source: Bloomberg, Data License. DOAM calculations.

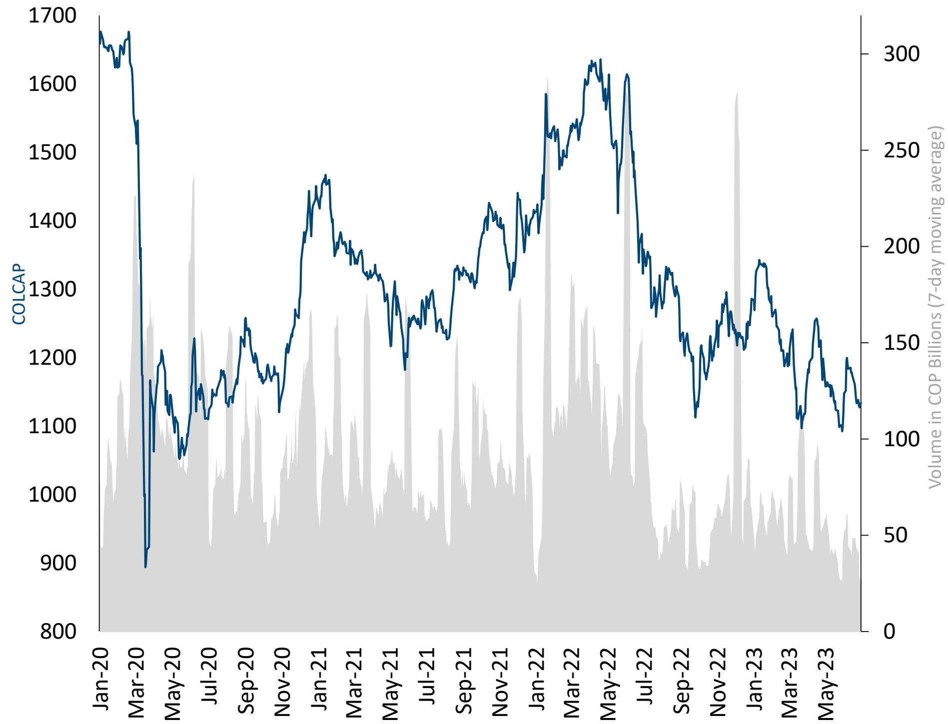
Table 7 . Average Performance of Stock Indexes by Sector (2Q23)

	Brazil	Mexico	Chile	Perú	Colombia*
Telecommunications	1.8	-7.8	2.9		-21.1
Consumer discretionary	42.8	10.4	-1.2		-8.5
Consumer staples	11.4	0.7	-0.4	-3.8	4.9
Energy	25.8		6.1		-12.6
Financial	28.0	-3.1	2.3	6.2	-4.2
Health care	40.1	-8.9			
Industrial	31.0	0.4	-5.4	-14.0	
Information Technology	42.8		-7.2		
Materials	3.3	1.2	-1.0	-5.2	5.9
Real estate	22.9		15.2		

Utilities	16.2	-1.9	20.1	2.9	12.1

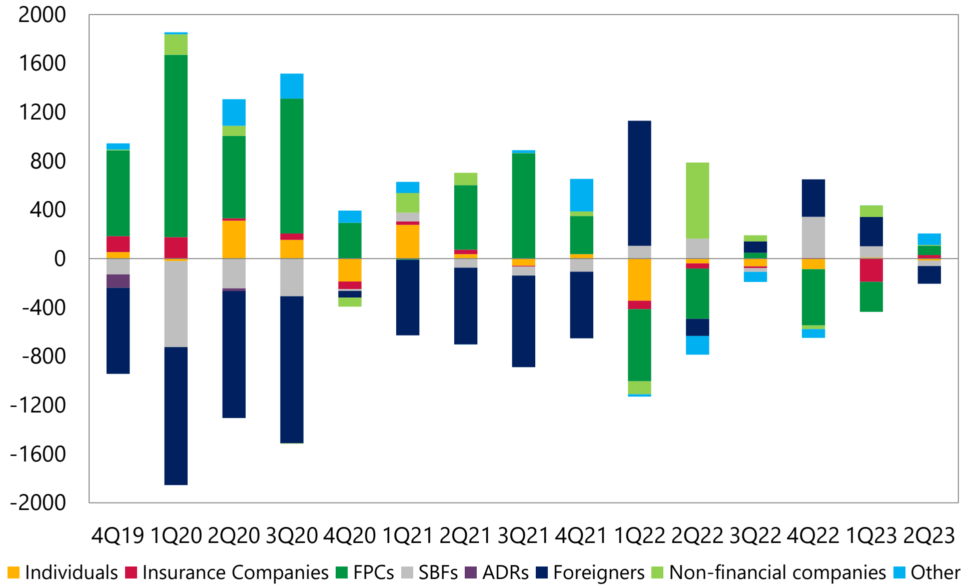
Source: Bloomberg. Values are in percentages.
Note: The sectors correspond to the GICS classification. The performance of each sector was calculated as the average variation of the stocks comprising each sector.
*The values for Colombia correspond to the average weighted by participation in the MSCI Colcap Index.

Graph 49. MSCI COLCAP and Daily Traded Volume



In addition to the above, when looking at the agents' behavior in the Colombian equity market, in the quarter, the largest net sellers were foreign investors (COP 145 billion), reversing the behavior they had been showing since the third quarter of 2022. In contrast, Pension and Severance Funds were the largest net buyers in the market (COP 77 billion), changing their position of the previous two quarters (Graph 50).

Graph 50. Net Purchases in the Local Equity Market by Type of Agent

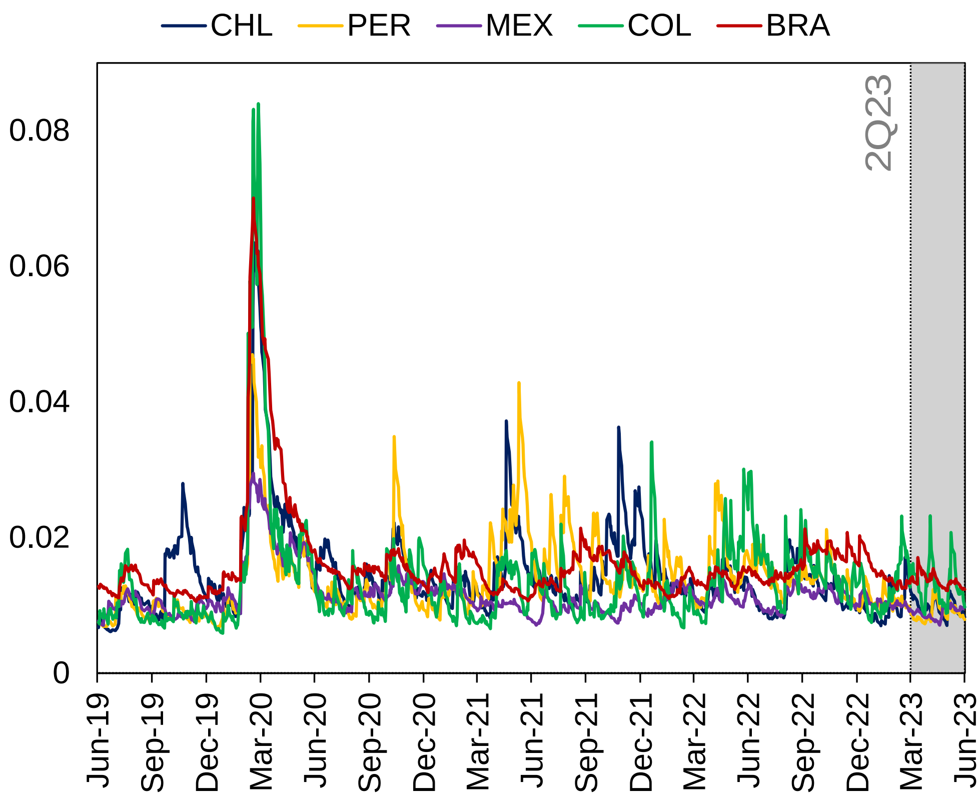


Finally, the average conditional volatility[60] of the stock indexes of analyzed countries in the region decreased for most of the countries during 2Q23, compared to the one observed in 1Q23.[61] (Graph 51). In particular, volatility decreased for the stock indexes of Brazil, Mexico, and Perú, while it increased for Colombia and Chile.

[60] Measured through GARCH models (1,1).

[61] The highest average figure was for Brazil (1.37%), followed by Colombia (1.30%), Chile (0.98%), Mexico (0.89%), and Perú (0.88%).

Graph 51. Conditional Volatility of Stock Indexes



8. Boxes

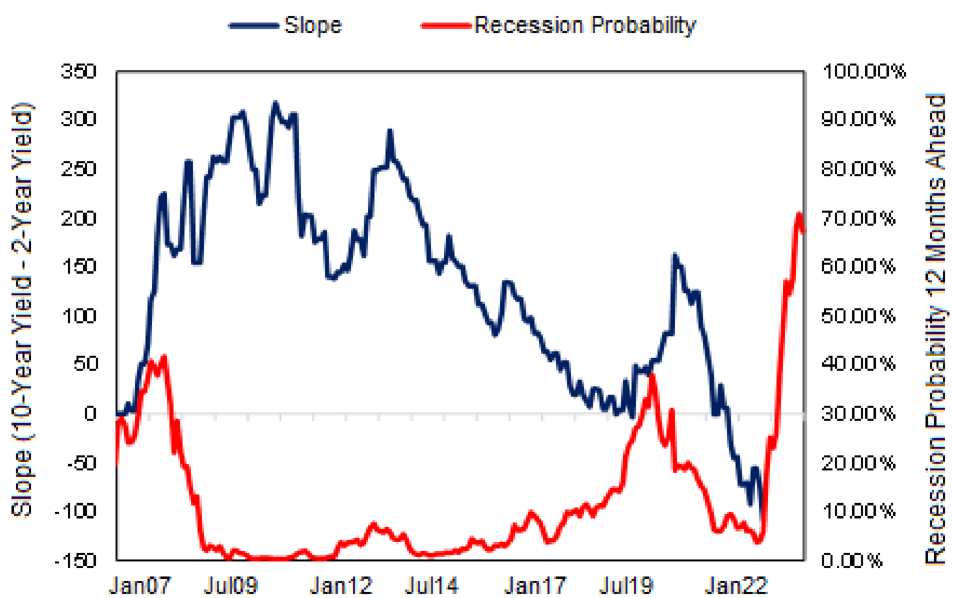
Box 1: Factors that may influence the Resistance to Inversion of the Yield Curve in Colombia

Oscar David Botero Ramírez
Julián Camilo Mateus Gamboa
Cristhian Hernando Ruíz Cardozo

Introduction

Recent analyses in the U.S. suggest that the cycle of increases in its benchmark interest rate was accompanied by the inversion of its yield curve and an increase in the probability of recession (Graph B1.1). The yield curve is understood to be inverted when long-term (10-year) bond rates are lower than short-term (2-year) rates. This behavior has been documented, and its predictive power to anticipate economic slowdown or recession events has been studied [62].

Graph B1.1. Probability of Recession in the U.S. and Slope of the Yield Curve



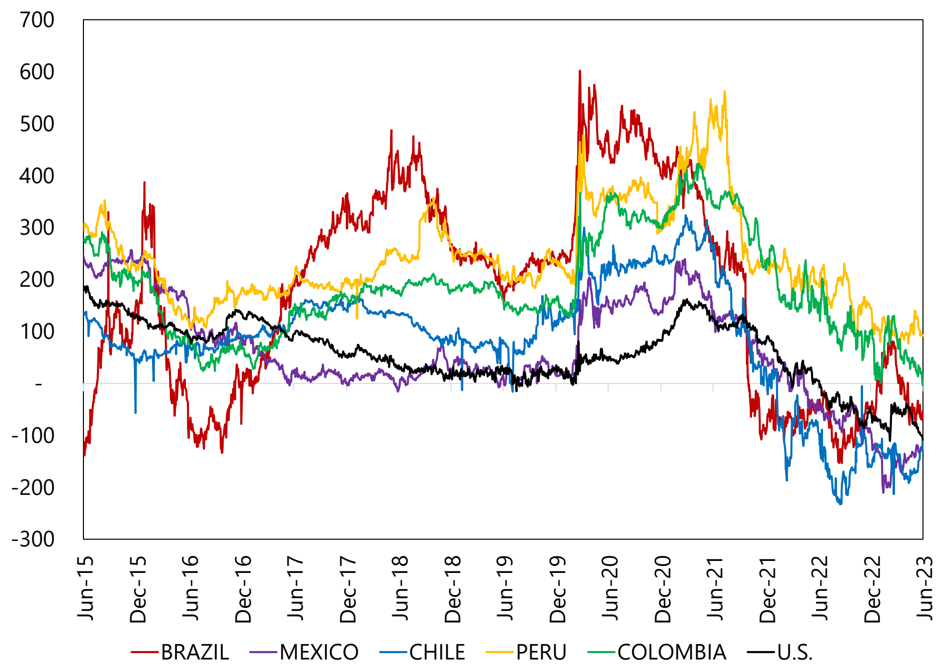
Source: Federal Reserve, National Bureau of Economic Research and *Banrep*.

The behavior of the yield curve slope for Latin American countries exhibits that the only slopes that are not inverted are those of Colombia and Perú (Graph B1. 2). The slope of the local currency nominal bond yield curve is inverted for most countries in the region in mid-2022 and on 30 June

[62] Some related works are Reuben A. Kessel, 1965; Campbell R. Harvey 1989; Arturo Estrella and Frederic S. Mishkin, 1998 and Glenn D. Rudebusch and John C. Williams, 2009.

2023 stood at -72 bps, -128 bps, and -60 bps, in Brazil, Mexico, and Chile, respectively. Meanwhile, the slopes of Colombia and Perú were close to historic lows.

Graph B1. 2. Yield Curve Slope in Latin American Countries and the U.S.



Source: Bloomberg and *Banrep*.

Therefore, this document seeks to identify the factors that explain why Colombia's slope has not inverted and is far from the behavior of most of its peers in the region. Thus, this Box is divided into five sections, including this introduction. The second section presents and analyzes some factors that may influence the yield curve behavior according to analysts and related literature. The third part provides the conceptual framework that guides the analysis. The fourth section reports the results of the empirical exercise. Finally, the last section presents the main conclusions.

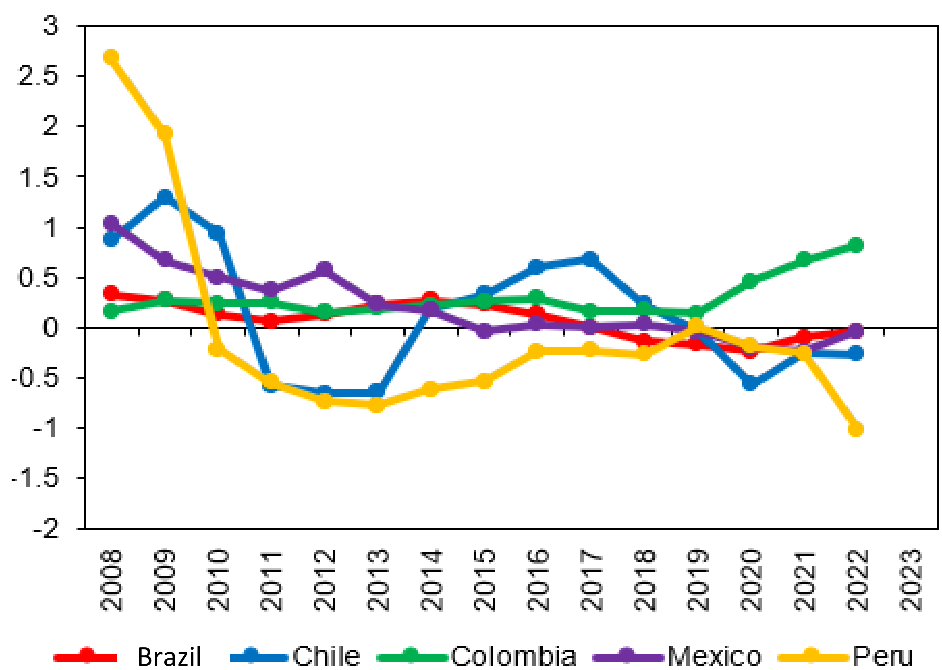
Market Feedback and Literature Review

Based on the information obtained from some market agents, the differential behavior of Colombia's curve compared to some countries in the region and the fact that the slope does not reach negative figures can be explained by the following arguments: *i)* the higher credit risk and an increase in fiscal and political risk; *ii)* the significant offer of long-term securities by the Colombian Ministry of Finance and Public Credit (MHCP in Spanish); and *iii)* market microstructure.

Regarding the first argument, the literature points out that the monetary policy expectations channel (linked to economic growth expectations) is not the only channel that can explain the shape of the yield curve. Changes in the slope could also be due to market participants' attitudes toward risk, and these flows could also help to understand the dynamics of real activity (Benzoni, Chyruk, and Kelley 2018). In this sense, variables such as credit risk, liquidity risk, and geopolitical risk, among other variables, would be decisive in analyzing the slope of yield curves.

In turn, the increased supply of long-term securities by the MHCP could affect the yield curve's slope by pressuring long-term premiums up. Various authors have found that the debt term is associated with increases in yields and the long-term premium due to a higher relative supply of securities in one curve segment (Chadha et al. (2013); Gagnon et al (2010); Greenwood & Vayanos (2010b) and D'Amico et al (2012)). In Colombia, although no literature supports the previous fact, there is an increase in the term of its debt through the placement of long-term securities, which could put upward pressure on the rates of the long end of the curve and its term premium (Graph B1. 3).

Graph B1. 3. Annual Change in the Average Life of the Debt Stock (Years).



Source: Bloomberg and *Banrep*.
The annual change in the average life corresponds to the difference between the average life of the debt stock for a given year and the same value of the previous year for each country in the sample. The average life is understood as the average time it takes to repay the outstanding principal of a bond.

In addition, the composition by type of investors could have implications on the shape of the term structure of the yield curve. In particular, under the preferred habitat theory[63] (Modigliani and Sutch, 1966), the concentration of participants in some segments of the curve could generate

[63] This theory states that risk-averse agents can better manage risk by positioning themselves on the yield curve end where the life of their assets coincides with the life of their liabilities.

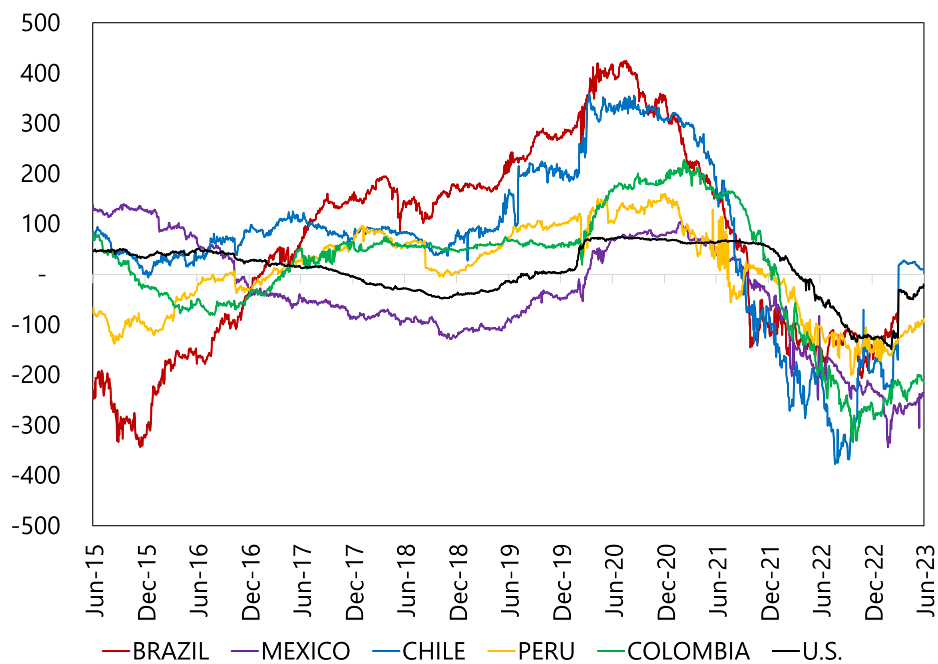
imbalances between supply and demand, resulting in liquidity premiums. Thus, the largest concentration of commercial banks at the short end of the curve (46% of total securities in this term) and the high participation of foreign investors and FPCs in the long end (26% and 33%, respectively), would influence the shape of the yield structure and would be supporting the existence of liquidity premiums at different maturities.

Conceptual Framework: Yield Curve Decomposition

The Adrian, Crump, and Moench (ACM-2013) methodology is used, which breaks down the rate of a bond into two factors: the risk-free rate (associated with monetary policy rate expectations) and the term premium (associated with risk premiums). Thus, the slope of the nominal bond rate is equal to the slope of the risk-free rate and the slope of the term premium.

Applying the ACM methodology (2013), it is found that the risk-free rate slope is inverted and is in line with the behavior of the countries in the region (Graph B1. 4). The inversion of this yield curve is in line with the expectations of monetary policy rate reductions and a slowdown in economic growth.

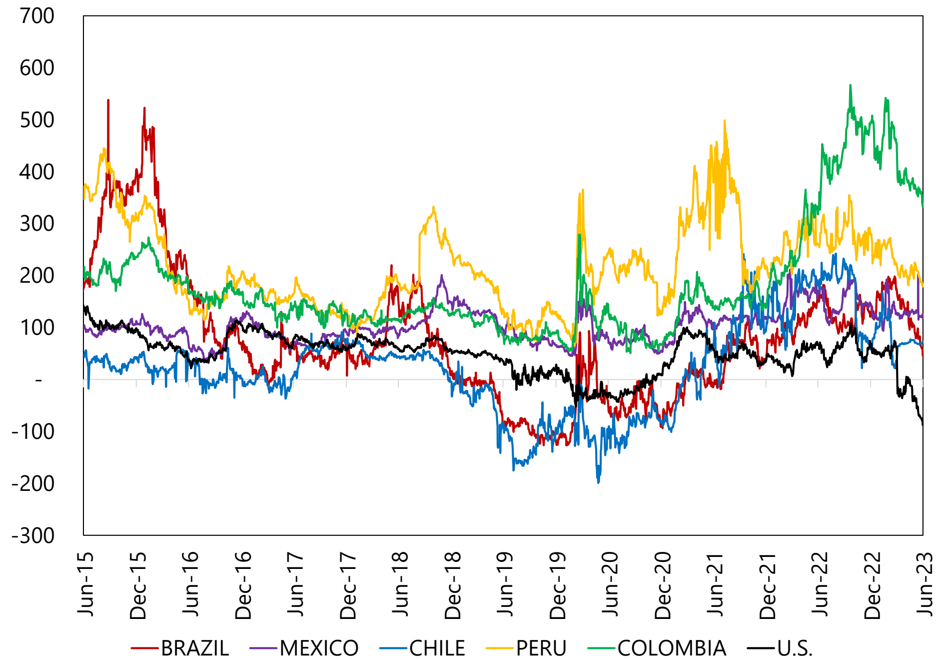
Graph B1. 4. Risk-Free Rate Slope.



Source: Bloomberg and *Banrep*.
They are obtained as the difference between the estimated 10-year and 2-year risk-free spot rates using the ACM (2013) methodology.

On the other hand, the slopes of the term premium of the countries in the region show divergent behaviors; in Colombia, this variable shows significant growth during 2022 (Graph B1. 5). This result suggests that the non-inversion of the yield curve can be attributed to a high level of the term premium for the 10-year term. In view of this behavior, it is important to determine the factors that explain the evolution of term premiums.

Graph B1. 5. Term Premium Slope.



Source: Bloomberg and *Banrep*.
They are obtained as the difference between the estimated 10-year and 2-year term premiums using the ACM (2003) methodology.

Empirical Approach: Some Determinants of the Term Premium

Considering the above, an econometric exercise is presented to study the relationships between some macroeconomic and financial variables and the 10-year term premium.[64] (Table B1. 1). The results suggest that the term premium is explained by an inflation risk premium, the fiscal deficit, risk appetite in emerging countries, a liquidity premium and, to a lesser extent, the socio-political risk factor. In addition, the large supply of long-term securities by the MHCP, measured through the average life of the debt, is not significant, and there is no statistical evidence to support that this variable has increased the term premium in this end of the curve (Table B1. 2).

[64] The analysis does not change using the term premium slope.

Table B1. 1. Macroeconomic and Financial Variables Studied

Variable	Description
Inflation risk premium	Standard deviation of one-year inflation expectations taken from *Banrep's* monthly expectations survey. Studies such as Ceballos, Naudon & Romero (2016) use this variable to measure inflation risk premium.
Fiscal deficit	Fiscal deficit on GDP.
Current account deficit	Current account deficit on GDP.
U.S. term premium (US_TP)	Term premium estimated for the U.S. using ACM methodology (2013).
Risk appetite indicator	Measured using the emerging markets risk appetite variable calculated by JP Morgan.
Liquidity premium	Measured by the Bid-Ask Spread of peso-denominated sovereign bonds in Colombia.
Average life of the debt (Average life)	The annual change in average life corresponds to the difference between the average life of the debt stock for a given year and the same value of the previous year for each country in the sample. The average life is understood as the average time it takes to repay the outstanding principal of a bond.
Socio-political risk (EOF_ISP)	Measured as the percentage of responses associated with the socio-political factor to the question of what are the most relevant factors when making investment decisions. This is one of the questions of the Financial Opinion Survey (EOF in Spanish).

Source: Bloomberg and *Banrep*.

Table B1. 2. Results of the regression between the 10-year term premium and economic and financial variables using FMOLS.

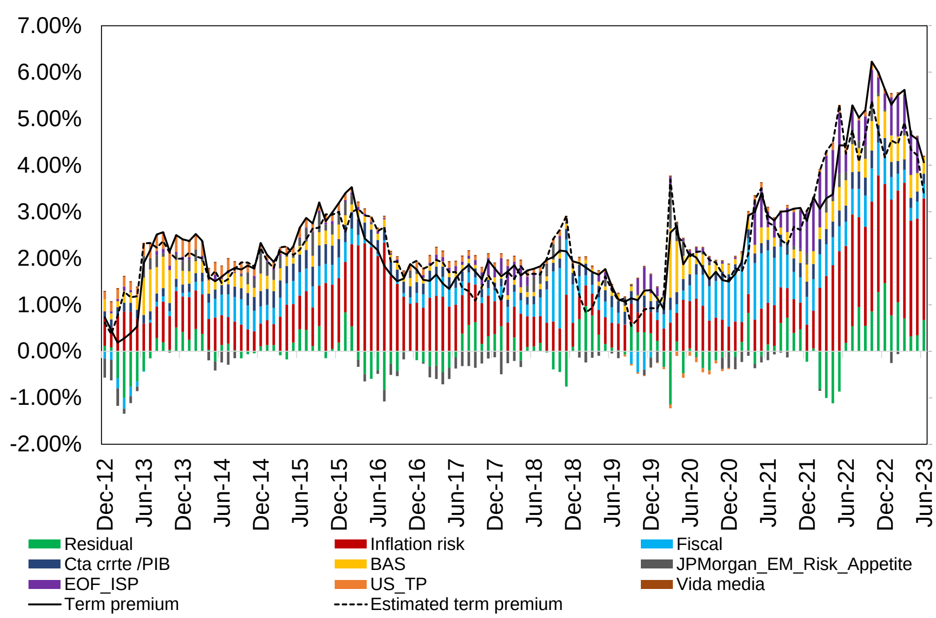
	Coefficient	Standard error	Statistic t	Prob

Inflation risk premium	2.128	0.285	7.459	1.5e-11 ***
Fiscal Deficit	0.001	0.000	4.341	2.9e-05 ***
Current account deficit	0.054	0.036	1.500	0.136
U.S. term premium	0.122	0.076	1.612	0.109
Risk appetite indicator	-0.002	0.001	-2.927	0.004 **
Liquidity premium	0.001	0.000	2.746	0.007 **
Average life of debt	0.028	0.025	1.132	0.260
Socio-political risk	0.019	0.005	3.696	0.0003***
Significance: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1				
R-*squared*: 0.799 N: 126				

Source: *Banrep*.

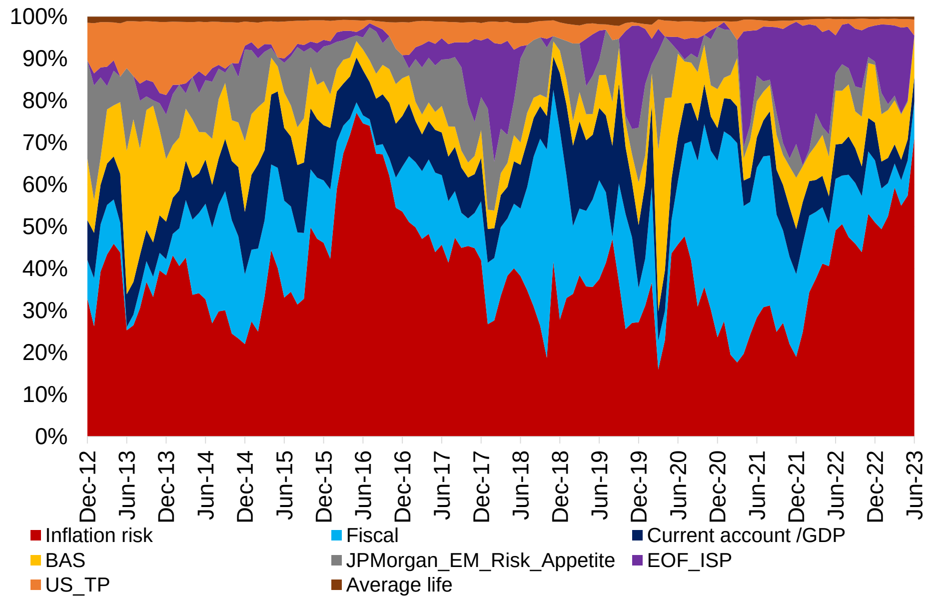
The results suggest that the factors that most affect the dynamics of term premiums are inflation risk premiums, the fiscal deficit, and the liquidity premium (Graph B1. 6). In addition, the results indicate that the increase observed during 2022 in the term premium can largely be explained by a significant increase in the inflation risk premium, followed by an increase in what could be associated with a socio-political risk premium (Graph B1. 7).

Graph B1. 6. Determinants of the 10-Year Term Premium.



Source: *Banrep*.

Graph B1. 7. Contribution of explanatory variables to the 10-year term premium flows.



Source: *Banrep*.

Conclusions

After reviewing the literature, contrasting the opinions of some market analysts, and applying some econometric exercises, it is found that the non-inversion of Colombia's yield curve can be explained by the term premium component. In particular, by breaking down the slope of the zero-coupon rates of TES in pesos in Colombia, the risk-free component shows a negative slope, which is aligned with the region's performance and the expectations of lower monetary policy rates and lower economic growth.

In addition, there is evidence of a possible link between the 10-year term premium and the inflation risk premium, the fiscal deficit, risk appetite in emerging countries, a liquidity premium and, to a lesser extent, a socio-political risk factor. Finally, the increase in the term premium in the recent period could be associated with an increase in an inflation risk premium and a greater perception of socio-political uncertainty.

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Box 2: Central Bank Asset Purchases in Response to the Covid-19 Crisis

Julián Camilo Mateus Gamboa

This Box summarizes the main findings on central banks' experience with asset purchases in response to the Covid-19 pandemic, emphasizing the Colombian case. The Bank for International Settlements (BIS) recently published a report [65] in which the Committee on the Global Financial System (CGFS) examined the experience of central banks in several emerging and developed economies, identifying those who conducted asset purchases in response to a crisis for the first time during the Covid-19 pandemic and those who expanded or reintroduced asset purchase programs. *Banrep* participated in this report by sharing its experience during the pandemic.

Main Findings

In response to the Covid-19 pandemic, a large number of central banks in developed and emerging economies decided to undertake asset purchase programs. Most of these programs were mainly aimed at addressing functioning of financial markets, thus ensuring an appropriate transmission of monetary policy. In the case of developed economies, given the restriction of the central banks of several of these economies to continue cutting their interest rates [66], the purchase program was also aimed at reducing long-term rates when short-term rates could no longer be lowered.

Given the impact of these programs, the BIS finds that during the first weeks of the pandemic, the provision of liquidity was essential for the proper functioning of the markets. In developed economies, a lower risk premium was subsequently evidenced in the debt market due to central banks' absorption of duration risk. In other words, central bank purchases reduced the private sector's exposure to duration risk (price sensitivity of a security to changes in interest rates) since these transactions involved the exchange of assets with low duration (such as Central Bank Reserves) for assets with higher duration in the private sector's portfolio (such as long-term bonds). Similarly, if the risk premium is broken down into credit risk, liquidity risk, and duration risk, central bank purchases could also put downward pressure on this premium by reducing private exposure to credit and liquidity risks. In contrast, in the case of emerging economies, the impact on the level of rates was more limited given the greater sensitivity of these economies to global financial market conditions.

The BIS found that the possible side or unwanted effects of these purchase programs were very limited. On the one hand, with the pandemic having a global joint expansionary monetary policy response, very few countries were affected by the adoption of these programs in other parts of

[65] Central bank asset purchases in response to the Covid-19 crisis. Produced by CGFS and directed by Margarita Delgado (Banco de España) and Toni Gravelle (Bank of Canada).

[66] This restriction is known as *zero lower bound* and refers to the restriction of central banks to continue accentuating an expansionary policy when their benchmark rate is near zero.

the world[67]. On the other hand, the rapid completion of these programs, given the economic reopening and strong inflationary pressures, may have limited the possible negative impact that these programs could have had if they had been in place for a longer period, as was the case for advanced economies after the 2008 financial crisis.

In summary, the main objective of central banks in implementing asset purchase programs was to support the correct functioning of the market and, thus, ensure the correct transmission of monetary policy. Regarding the impact of these programs, most consider that they contributed to the improvement of liquidity and public debt market prices. The following is a summary of the experiences of central banks in the region and other emerging economies in accordance with their statements in the BIS document (*Table 8*).

[67] For example, during the 2008 financial crisis, the fact that most developed economies' central banks reduced their interest rates to historic lows encouraged portfolio investment flows to emerging economies since the latter still offered attractive interest rates, unlike their developed peers. This generated excessive leverage in several of these economies, making them vulnerable to potential episodes of sudden capital outflows.

Table 8. Experience of some Central Banks

Country	Eligible securities	Target	Amount
Colombia	- Sovereign bonds (TES): Along the curve - Private debt: They are only issued by financial institutions with a rating above A and a maturity of less than three years.	To support the proper functioning of the market in order to correct liquidity shortages and improve proper price formation.	- Sovereign bonds: COP 2.8 trillion (0.3% of GDP) - Private debt: COP 8.7 trillion (0.8% of GDP)
Chile	- Bank bonds of all participants in the open market operations system - Bonds issued by BCCh	To improve liquidity in local currency	- Bank bonds: US$4 billion (1.6% of GDP) - BCCh bonds: US$815 million (0.3% of GDP)
Brazil	Sovereign bonds (purchase and sale auctions made by the National Treasury), of which 77% corresponded to long-term inflation-tied securities.	- To support liquidity in the secondary market - To provide reference prices in times of market stress	BRL 33.1 billion (US$6.4 billion)
Mexico	Twist operations: Purchases of sovereign securities over ten years in exchange for short-term securities (less than three years to maturity).	To avoid disruptions in the public debt market by allowing market participants to reduce duration risk while promoting the orderly functioning of the market	Although the program was for MXN 100 billion (US$4.1 billion, 0.4% of GDP), only MXN 15 billion (US$0.6 billion, 0.1% of GDP) was awarded, showing that the need to hedge interest rate risk through this mechanism was not as high as expected.

Hungary	Sovereign bonds and government-backed securities: While initially an attempt was made to limit the purchase of a particular security to 33% of the outstanding balance, it was later decided that it could exceed 50% if required to ensure liquidity and market stability. Regarding the maturity of the securities to be purchased, the Bank focused on long-term securities.	- To maintain the efficiency of monetary policy transmission - To maintain the stability of the public debt market - To ensure that interest rates the Bank sets will be reflected in the long end of the curve.	HUF 3.65 trillion (7.5% of GDP)
India	Sovereign bonds through OMOs (70% of operations focused on the 5 to 10-year term) and twist operations (buying long-term bonds and paying short-term bonds).	- Market functioning - Monetary policy transmission	- OMOs: INR 5.9 trillion (US$80 billion, 3.0% of GDP) - Twist operations: INR 2.4 trillion (US$33 billion, 1.2% of GDP)
Malaysia	Sovereign bonds: Not more than 10% of the outstanding balance of each security	- To provide liquidity - To ensure an orderly functioning of the market	MYR 9.4 billion (US$2.1 billion, 0.6% of GDP)

Country	**First time?**	**Impact**	**End of program**
Colombia	- Sovereign bonds: No - Private debt: Yes	Improved TES secondary market liquidity and public and private debt prices	- March and April 2021: Sales for COP 5.9 trillion (0.6%) - Subsequently, the Bank purchased TES for COP 23 trillion (2.1% of GDP) to offset some long-term liquidity needs.
Chile		They mention their role in providing liquidity to the PFMs during the three approvals of savings withdrawals. This	

		prevented emergency sales of the PFMs' portfolio	
Brazil	In May 2020, the BCB was authorized to carry out transactions in the secondary public (local and foreign currency) and private debt markets. However, that authorization was sufficient to help improve liquidity and prices, so the BCB did not see the need to intervene in that market.		
Mexico		Reduced short-term rates, which in turn contributed to looser financial conditions	The Bank had initially announced that its program would end in February 2021. That month, the Bank announced that it would stand ready to conduct such operations as it deemed necessary.
Hungary	Yes. However, even before the crisis, the Bank was already supporting the local debt market through purchases of corporate and mortgage bonds.	- The program supported the extension of the maturity profile of sovereign debt and the reduction of the slope of the curve by lowering long-term rates. - The spread between the 10-year bond and its German counterpart also narrowed, reflecting not only global factors but idiosyncratic factors that contributed to the reduction in sovereign bond rates. - Liquidity returned to historical average levels	In August 2021 the Bank began to reduce the pace of weekly purchases from HUF 60 billion to HUF 50 billion, and subsequently to HUF 40 billion. In December, the Bank announced the final termination of the program

India	No	- Financial stress was reduced and orderly market conditions were ensured. Monetary policy transmission strengthened and credit flow was supported - Interest rates and spreads fell to pre-covid levels - According to an event study, for every 10% of GDP in purchases, rates fall by 80 bps	- In October 2021, the Bank announced the end of its asset purchase program - In order to reduce excess liquidity, the Bank has moved from its overnight window to longer-term reverse repos
Malaysia	No	As evidenced by moderate market flows, purchases provided sufficient liquidity and facilitated an orderly price adjustment	Since the Bank's holdings are negligible compared to the size of the market, no exit plan is required. The Bank simply plans to let the bonds mature and not reinvest them

Colombian Case

During the Covid-19 crisis, *Banrep* implemented several policies focused on protecting the payment system, stabilizing the sovereign and corporate debt markets, supporting the foreign exchange market[68], and ensuring that credit continued to flow to the economy. One of the first decisions made by *Banrep* at the beginning of the crisis was to reduce its interest rate to all-time lows. With respect to the sovereign and corporate debt markets, given the high turbulence observed at the beginning of the pandemic, the low liquidity, and the distortion of the prices of these assets[69], *Banrep* decided to: *(i)* expand the amount, term, institutions (trusts, stockbrokers, investment management companies, and pension fund managers) and collateral types (high-quality corporate debt and debt receivables) eligible to participate in liquidity operations (repo transactions) managed by *Banrep*; and *(ii)* purchase sovereign and corporate bonds (the latter issued only by financial institutions). *Banrep* also implemented other measures such as reducing the reserve requirement from 11% to 8.0% providing additional liquidity of up to COP 10 trillion.

***Banrep's* purchases were focused on providing sufficient liquidity to the system amid increased uncertainty, supporting the proper functioning of the market, and improving appropriate price formation. It was not one of the objectives of these purchases to directly impact debt security rate levels.** In March and April 2020, *Banrep* purchased COP 8.7 trillion (0.8% of 2019 GDP) in securities issued by financial institutions. Eligible securities had to have a credit rating higher than A and a maturity of less than three years. This was the first time *Banrep* purchased assets of this type as part of its policy of expanding the type of assets and collateral included in its balance sheet.

In Colombia, monetary policy operates mainly through transactions with sovereign bonds (TES). These transactions are made at market prices in the secondary market and consider estimates of supply and demand of the monetary base. In this sense, purchases of public debt are a common tool implemented by *Banrep* to provide structural liquidity to the market in order to align the benchmark interbank rate (IBR in Spanish) with the monetary policy rate. During the pandemic, these transactions also helped to support the proper functioning of the market (correcting liquidity shortages and enhancing robust price formation). In order to provide sufficient liquidity in pesos and support market functioning, *Banrep* announced the purchase of up to COP 4 trillion (0.4% of GDP) of TES between March and April 2020. As market conditions recovered quickly, purchases were limited to COP 2.8 trillion (0.3% of GDP). These operations were carried out along the entire TES curve.

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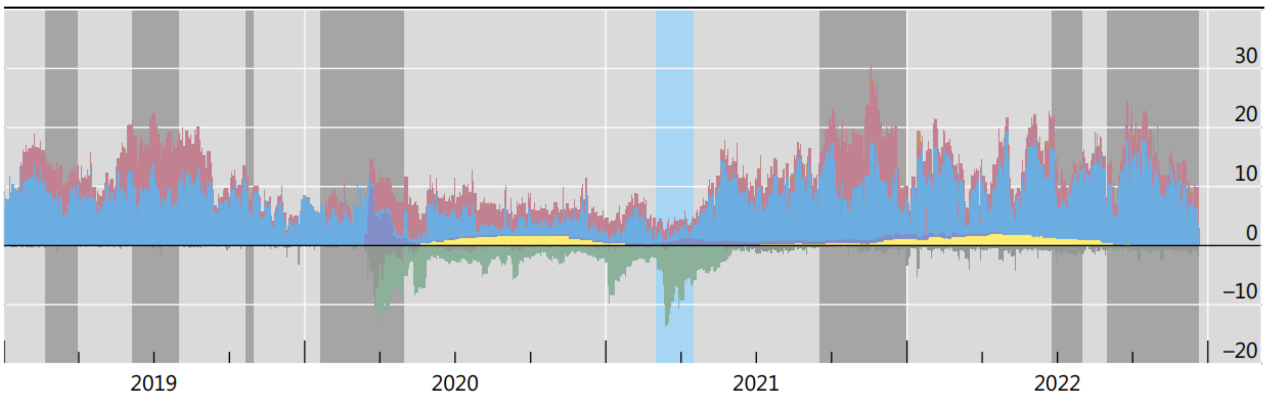
[68] *Banrep* did not intervene in the spot market. However, between March 2020 and March 2021, *Banrep* sold U.S. dollars through non-delivery forward (NDF) contracts in order to offset any potential tightness in the hedging instruments market. In March and April 2020, the Bank also offered 60-day FX swaps to provide short-term liquidity in U.S. dollars.

[69] In March 2020, the daily average BAS of peso sovereign securities stood at 28.5 bps, well above the average level of 2.1 bps observed during 2019. Likewise, the average daily rate of the 10-year sovereign bond reached a level of over 9.0% during the last days of March 2020, well above the average level observed in 2019 (6.5%).

Following the implementation of several liquidity instruments during the pandemic, in March and April 2021, some liquidity was withdrawn from the system through TES sales (COP 5.9 trillion, 0.6% of GDP). Subsequently, during the same year and 2022, the Bank purchased TES for COP 11 trillion (1.0% of GDP) and COP 12.2 trillion (1.1% of GDP), respectively, as a mechanism to offset some long-term liquidity needs. These transactions were focused on aligning the benchmark interbank rate with the monetary policy rate. Graph B2.1 shows the monetary policy mechanisms implemented by the Bank since May 2019.

Graph B2.1. Balance of *Banrep's* Temporary Liquidity Transactions



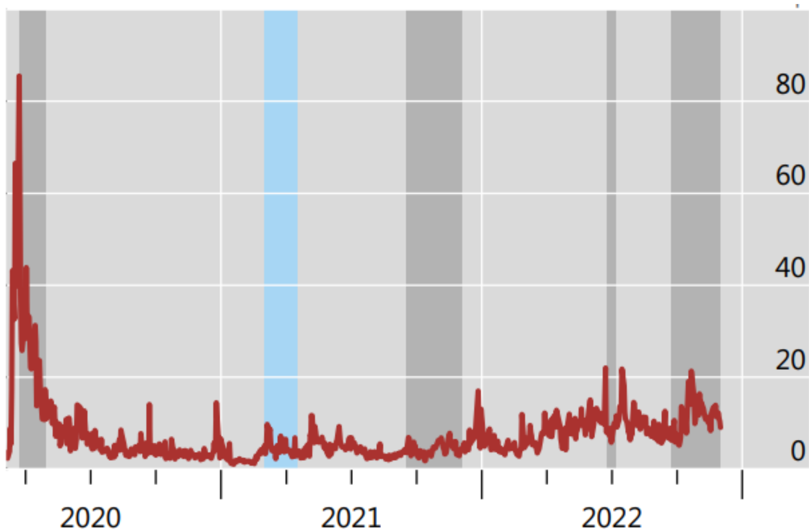
Source: *Banrep*.
The gray shaded areas indicate the periods in which *Banrep* purchased assets. The blue shaded areas indicate the periods in which *Banrep* sold assets. Figures are in COP trillions.

In line with *Banrep's* interventions in 2020, some important signs of recovery in terms of liquidity conditions (Graph B2.2) and asset prices were observed (Graph B2.3). After the Bid-Ask Spread (BAS) of peso-denominated TES increased from less than 5 bps in February 2020 to levels above 80 bps in March 2020[70], *Banrep's* intervention may have contributed to the rapid recovery of liquidity conditions during the subsequent months [71]. The BAS increased in Colombia in line with what was observed in the region's public debt markets, but corrected rapidly thereafter. Also, following a sharp reduction in the prices of sovereign and corporate debt securities in March 2020, these assets returned to their original price levels in line with the purchases implemented by *Banrep*.

[70] Alternative liquidity measures of this market (e.g., traded volume and depth) show a similar pattern to the BAS's.

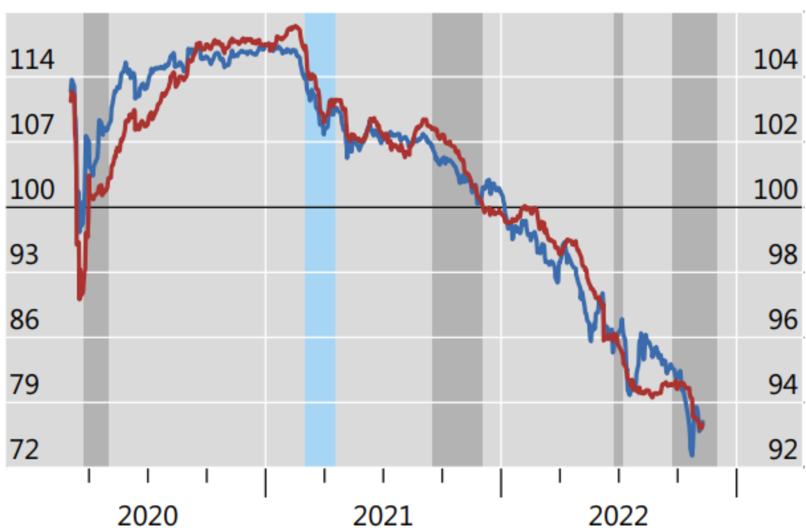
[71] To date, no analysis has been conducted to measure the impact of *Banrep's* purchases on the yields of public and private debt instruments.

Graph B2.2. BAS of Peso-denominated TES (bps)



Source: *Banrep*.
The gray shaded areas indicate the periods in which *Banrep* purchased assets. The blue shaded areas indicate the periods in which *Banrep* sold assets. Figures are in COP trillions.

Graph B2.3. Colombian Public and Private Debt Price Index



Source: *Banrep*.
The gray shaded areas indicate the periods in which *Banrep* purchased assets. The blue shaded areas indicate the periods in which *Banrep* sold assets. Figures are in COP trillions. Public debt is shown on the blue line (left axis) and private debt is shown on the red line (right axis).

Subsequently, in 2021 and 2022, local financial conditions tightened as a result of the international environment (i.e., global contractionary monetary policy, the war in Ukraine and the Zero-Covid policy in China), as well as on account of some idiosyncratic factors linked to the increase in the monetary policy rate, the loss of investment grade, some episodes of socio-political turmoil in

2021, and uncertainty regarding the parliamentary and presidential elections in 2022. However, liquidity conditions have shown a better response than in March 2020.

***Banrep* has not implemented a quantitative easing program and its purchases in the TES market have sought a level of liquidity that is in line with market requirements.** Any adjustments in the Bank's asset portfolio have been consistent with the goal of keeping the O/N IBR aligned with the monetary policy rate[72].

Regarding purchases of corporate debt securities, *Banrep* has not purchased additional assets of this type since April 2020. This measure was temporary and was notified to the market at the time. However, the Bank can still intervene in the sovereign and corporate debt markets when it deems it appropriate. Additionally, some counterparties accepted for liquidity operations during the Covid-19 crisis remain active despite the end of the emergency market. This is to ensure adequate response in the event that economic conditions change rapidly. For example, trusts, pension fund managers, and open-ended funds remain on the list of authorized counterparties (under certain conditions).

[72] In 2021, *Banrep* reduced its balance sheet by selling TES (in order to drain liquidity to align the IBR with the MPR), and also as a result of the transfer of profits to the Colombian Government.