Are Inflation Expectations Well Anchored in Mexico?

Remy Beauregard, Jens H.E. Christensen, Eric Fischer, and Simon Zhu

Price inflation has increased sharply since early 2021 in many countries, including Mexico. If sustained, high inflation in Mexico could raise questions about the ability of its central bank to bring inflation down to its 3% inflation target. However, analyzing the difference between market prices of nominal and inflation-indexed government bonds suggests investors' long-term inflation expectations in Mexico are close to the central bank's inflation target and are projected to remain so in coming years.

Inflation has risen substantially in many countries, including Mexico, since early 2021, driven in part by unique factors related to the COVID-19 pandemic. Sustained elevated inflation could be particularly challenging for inflation-targeting central banks in emerging economies given their higher macroeconomic uncertainty and greater sensitivity to external shocks compared with more developed economies. To examine this risk for a representative emerging economy affected by COVID-era disruptions in much the same way as the United States, we focus on Mexico, which has conducted monetary policy since 2002 according to an inflation targeting regime with a target rate for consumer price inflation of 3% per year.

In this *Economic Letter*, we assess whether recent higher inflation is leading businesses and households in Mexico to expect inflation to remain high over the long run. Specifically, we focus on what rising market-based measures of inflation compensation may imply about bond investors' outlook for inflation. The rise in inflation compensation since spring 2021 could reflect three factors: an increase in investors' inflation expectations, an uptick in the premium investors demand for assuming inflation risk, or changes in other risk and liquidity premiums. We explore the relative importance of each of these factors using a novel dynamic term structure model of nominal and inflation-adjusted yields described in Beauregard et al. (2021, henceforth BCFZ). Overall, our results for five-year inflation expectations five years from now suggest Mexican bond investors' long-term inflation expectations have been little affected by the recent rise in inflation. Instead, the rise in inflation compensation reflects a notable uptick in the inflation risk premium to the high end of its historical range. This suggests that, despite inflation expectations being little changed on average, some investors are particularly concerned about the risk that inflation will remain above expected levels.

The recent rise in Mexican inflation

Figure 1 shows the year-over-year change in the Mexican consumer price index (CPI) measured both by the headline CPI (green line) and the more stable core CPI (blue line) that strips out volatile food and energy
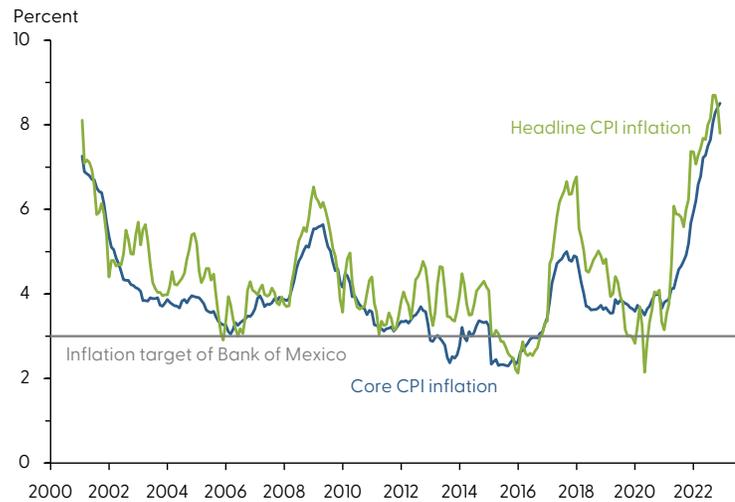
prices. Also shown with a horizontal gray line is the 3% inflation target of the nation's central bank, the Bank of Mexico.

We note that Mexican CPI inflation has averaged somewhat above the Bank of Mexico's target since its adoption in 2002. More importantly, CPI inflation in Mexico appears to have become more volatile and somewhat higher over the past five years. Although previous research by De Pooter et al. (2014) found inflation expectations in Mexico to be well anchored, the significant global economic dislocations caused by the coronavirus pandemic and related inflationary pressures could impact inflation expectations of businesses and households.

Figure 1
Mexican consumer price index inflation

Source: Instituto Nacional de Estadística y Geografía.

To assess the persistence of the recent rise in Mexican inflation, we turn to financial market data, which reflect forward-looking expectations among a large and diverse group of investors and financial market participants. Specifically, we consider prices of conventional fixed-coupon bonds that pay a nominal interest rate and inflation-indexed bonds that pay a real interest rate because their cash flows are adjusted with the change in the CPI and therefore maintain their purchasing power. Both types of securities are issued and guaranteed by the Mexican government.

The difference between nominal and real yields for bonds of the same maturity is known as breakeven inflation (BEI). This represents a market-based measure of inflation compensation used to assess financial market participants' inflation expectations. Figure 2 shows BEI rates at different maturities, meaning annual average rates of inflation compensation between now and maturity, from 1 to 10 years at the end of March 2021 (green line) and at the end of November 2022

Figure 2
BEI curves for 1-year to 10-year Mexican bond maturities
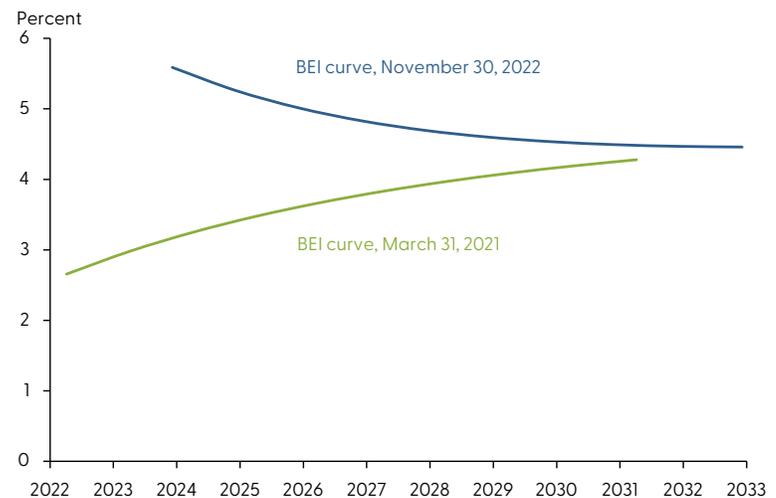
Source: Authors' calculations using bond prices from Bloomberg.

(blue line). The slightly upward-sloping BEI curve of close to 3% in 2021 contrasts with the higher downward-sloping BEI curve in 2022.

The increase for shorter maturities, the left end of the 2022 BEI curve, is closely tied to the current high level of inflation and suggests inflation may remain elevated for some time. In contrast, the increase at longer maturities, the right end of the 2022 BEI curve, suggests that investors' longer-term inflation expectations may be drifting above the Bank of Mexico's inflation target. To better understand the shape and sources of variation of the BEI curve we use a yield curve model.

A yield curve model of nominal and real yields

Market-based measures of inflation compensation such as BEI rates contain three components. First, they include the average CPI inflation rate expected by bond investors, which is the focus here. Second is an inflation risk premium to compensate investors for the uncertainty of future inflation. This premium is embedded in nominal yields that provide no inflation protection. Third is the difference in relative market liquidity between standard fixed-coupon and inflation-indexed bonds. As discussed in BCFZ, both of these types of Mexican bonds are less liquid than U.S. Treasuries, and their prices therefore contain a discount to compensate investors for their liquidity risk. Neither the inflation risk premium nor the liquidity premiums are directly observable and must therefore be estimated.

To adjust for these challenges, we first use the nominal and real yields model developed in BCFZ to identify liquidity premiums in standard fixed-coupon and inflation-indexed bond prices as a function of the time since issuance and the remaining time to maturity. The time since issuance serves as a proxy for declining liquidity as, over time, a larger fraction of bonds gets locked into buy-and-hold strategies. We refer to the observed BEI net of estimated liquidity premiums as the *adjusted* BEI. In a second step, we then separate adjusted BEI into components representing investors' inflation expectations using a formula based on the absence of bond market arbitrage opportunities and the residual inflation risk premium.

Results

To assess whether investors' inflation outlook has fundamentally changed, we follow De Pooter et al. (2014) and examine the five-year forward BEI rate that starts five years ahead, denoted 5yr5yr BEI. This is a horizon sufficiently long into the future that most transitory shocks to the economy can be expected to have vanished. Hence, the embedded inflation expectations are presumably less affected by current high inflation and pandemic-related transitory conditions and can therefore speak to the question about the anchoring of inflation expectations in Mexico.

Figure 3 shows the breakdown of 5yr5yr BEI into its various components according to our model. The dark blue line is the observed BEI, and the red line is the estimated adjusted BEI without liquidity risk premiums or other residual disturbances. The difference between these two measures of BEI—the yellow shaded area—represents the model's estimate of the net liquidity premium or distortion of the observed BEI series due to risk premiums in both nominal and inflation-indexed bond prices. The adjusted BEI is entirely above the

observed BEI, suggesting the liquidity risk distortions are systematically larger in the inflation-indexed bond prices, consistent with similar evidence from the U.S. Treasury market (Andreasen and Christensen 2016). Note that the net BEI liquidity premium widened around the financial turmoil in spring 2020 at the start of the pandemic and remains elevated.

The model also allows us to break down the adjusted BEI into an expected inflation component (light blue line) and the residual inflation risk premium (green line). Also shown is the Bank of Mexico's 3% inflation target (gray horizontal line). For comparison, the figure also shows the 5yr5yr expected CPI inflation in Mexico reported semiannually in the Consensus Forecasts surveys (dark blue squares). We note that both observed and adjusted BEI have trended higher since the start of the pandemic in early 2020. Importantly, the breakdown indicates that long-term expected inflation in Mexico has remained stable, slightly above the 3% inflation target. As a result, the increase in BEI can be attributed to the inflation risk premium, which is at the high end of its historical range towards the end of our sample. Given the elevated levels of current inflation, this suggests some investors are concerned that inflation could remain elevated for longer than currently anticipated.

This raises the question whether long-term inflation expectations in Mexico are likely to remain anchored near their current level going forward. To assess this risk, we simulate 10,000 factor paths over a three-year horizon using the estimated factors and factor dynamics as of November 2022—that is, the simulations are conditioned on the shapes of the nominal and real yield curves and investors' embedded forward-looking expectations as of November 2022. These simulated factor paths are then converted into forecasts of 5yr5yr expected inflation. Figure 4 shows the

Figure 3
Components of 5yr5yr breakeven inflation for Mexico
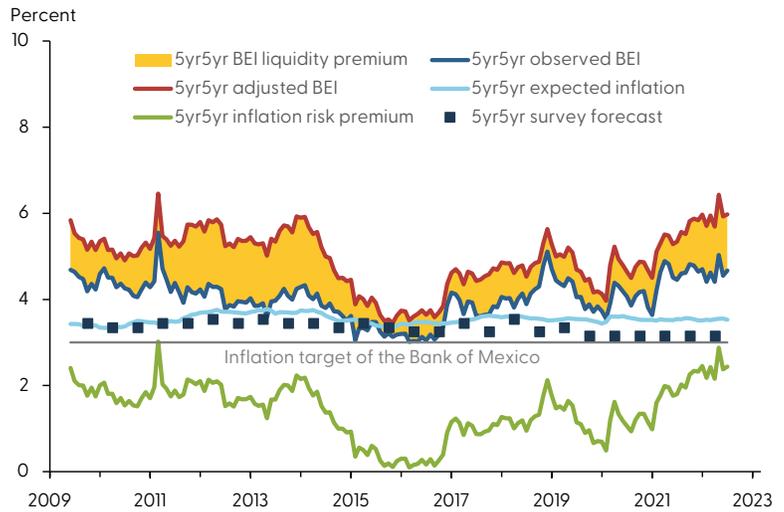
Source: Survey forecasts from Consensus Economics and authors' calculations using bond prices from Bloomberg.

Figure 4
Three-year projections of 5yr5yr expected inflation, Mexico

Source: Authors' calculations.

median projection (solid green line) and the 5th and 95th percentile values (dashed green lines) for the simulated 5yr5yr expected inflation over a three-year horizon.

Our model projections indicate that long-term inflation expectations are likely to deviate only modestly from their current level, consistent with the variation of the historical estimates back to 2009. Overall, our findings represent tangible evidence that long-term inflation expectations remain well anchored in Mexico despite the recent rise in inflation.

Conclusion

Global inflation pressures in the aftermath of the pandemic have raised fears about a sustained increase in the level of inflation around the world, which could be particularly challenging for developing economies with monetary policy guided by an inflation target. In this *Letter*, to assess this risk for a major emerging economy with an established inflation target, we examine the variation in Mexico's nominal and inflation-indexed bond prices, while accounting for their respective liquidity risk premiums. This allows us to estimate Mexican bond investors' inflation expectations and associated risk premiums. The results reveal that the inflation risk premium has pushed up Mexican BEI rates in recent years, while investors' long-term inflation expectations have remained stable near the Bank of Mexico's inflation target despite the rise in inflation.

The policy path needed to keep inflation expectations anchored in a situation with highly elevated inflation may involve tradeoffs. The Bank of Mexico responded early and forcefully to inflation pressures starting in June 2021 and has indicated further tightening of the policy rate would likely be appropriate to bring inflation back down to target over the medium term. This could lower economic growth in Mexico in both 2022 and 2023. On the other hand, history shows that it may be difficult and costly to reverse extended departures from announced inflation targets. Thus, it will be important for central banks with inflation-targeting frameworks to monitor measures of long-term inflation expectations in the current situation.

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