Box 2.3

Drivers of Inflation Expectations

Inflation expectations play an important role in the functioning of the monetary transmission mechanism (Blinder et al., 2008). Stability of long-term inflation expectations is regarded as one of the most significant features of efficient and credible monetary policy. By playing a significant role in forming economic preferences of agents, inflation expectations impact real economic activity and inflation dynamics. The functioning of the expectations channel is closely related to the extent to which economic agents perceive the central bank to be committed to combating inflation. For instance, if the central bank is credible and the economic agents trust in its commitment to the fight against inflation, tightening of monetary policy leads to a fall in inflation expectations. Accordingly, monetary policy will be more likely to succeed against inflation by impairing the persistence in inflation. For this reason, it is useful to determine how inflation expectations are formed and the role a central bank plays in the formation of expectations is of importance.

The latest World Economic Outlook published by the IMF, discusses inflation expectations in detail and presents the increasing role of inflation expectations on registered inflation. The report also includes findings regarding the decisive role that economic agents' choice between backward-looking or forward-looking expectations plays in the effectiveness of monetary policy (IMF, 2023).

In this study, we estimate a vector autoregression model (VAR) with seven endogenous variables in order to understand better the factors, the monetary policy stance in particular, driving inflation expectations. The Bayesian method is employed in model estimation, covering the period between the first quarter of 2006 and the third quarter of 2023.[1] Endogenous variables, in turn, are Brent crude oil price, import unit value index, exchange rate (basket), output gap, headline inflation, 12-month ahead inflation expectations and the policy rate. Among the variables, Brent crude oil price, import unit value index, exchange rate and seasonally adjusted headline price index are introduced into the model in logarithmic difference terms and the attained headline inflation is annualized. Inflation expectations and policy rate are in annual terms. For inflation expectations (12-month ahead), data from the Market Participants Survey, conducted by the CBRT, is used. Output gap data comes from various models used within the CBRT. Global growth index (export-weighted), minimum wage, Global Supply Chain Pressure Index, credit default swap rate and the measure that gauges the impact of taxes and administered prices are the exogenous variables in the model. Minimum wage and the global growth index are in logarithmic difference terms. In estimation, we used normal-inverse Wishart distribution as prior and allowed hyperparameters to maximize the likelihood function. Considering the large number of endogenous variables in the model, we included two lags.

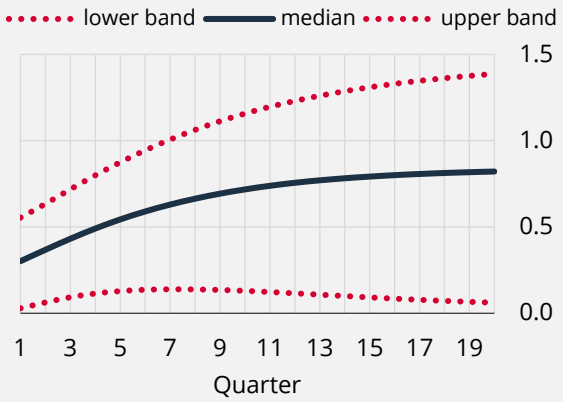
In accordance with previous findings (Gülşen and Kara, 2021; Koç et al., 2021), the cumulative impulse-response functions suggest that inflation outturns, in particular, and increases in the exchange rate basket are the main variables that raise inflation expectations (Chart 1). The response of expectations to global crude oil price shocks is more limited.[2] On the other hand, our findings[3] reveal the importance of monetary policy stance in anchoring expectations; monetary policy tightening shocks lower expectations. As a matter of fact, when the model is estimated with six endogenous variables without the policy rate, while response to Brent crude oil shocks does not change, response to

[1] For detailed information about the method, see Öğünç (2019).
[2] It should be noted that the exchange rate and crude oil are included in the model as quarterly changes without annualizing.
[3] Although response to the output gap assumes the expected sign, a wide credibility band, including zero, is attained.

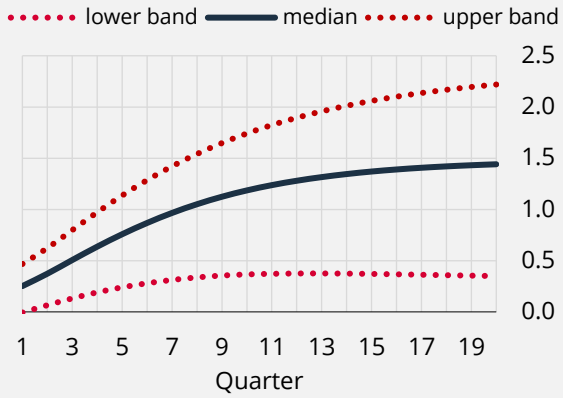
inflation and exchange rate shocks, particularly inflation, strengthen.[4] When the findings are assessed together, it is confirmed that monetary policy plays an important role in anchoring expectations and that tightening measures have an impact on inflation not only directly but also indirectly via the expectations channel. Accordingly, the monetary tightening that the CBRT has implemented since June will have an influence on managing inflation expectations.

Chart 1: Cumulative Impulse-Response Functions* (Responses to a 10-point Shock)

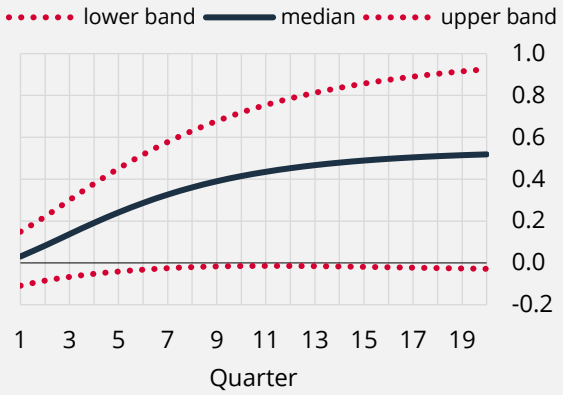
Response of Expectations to Inflation Readings



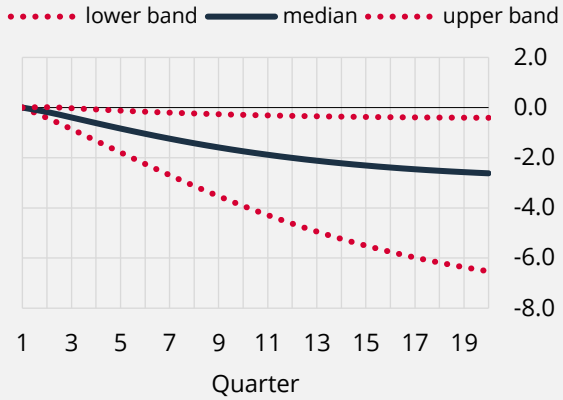
Response of Expectations to the Exchange Rate



Response of Expectations to Brent Crude Oil



Response of Expectations to the Policy Rate



* Cumulative impulse-response functions are displayed with 68% credibility bands.

In addition to monetary tightening, the CBRT aims to be influential during the process of anchoring expectations through revisions in inflation forecasts published in Inflation Reports and through referring to forecast paths in monetary policy texts. The fact that economic agents may exhibit backward-looking behavior in forming inflation expectations increases the inflation-growth tradeoff during disinflation by undermining the effectiveness of monetary policy decisions. Adoption of forward-looking behavior by economic agents in forming expectations will strengthen the effectiveness of monetary policy, ensuring the achievement of the targeted inflation path faster and at lower cost. Within this framework, encouraging economic agents to take the CBRT's inflation forecasts as reference instead of registered inflation will contribute to the achievement of the targeted

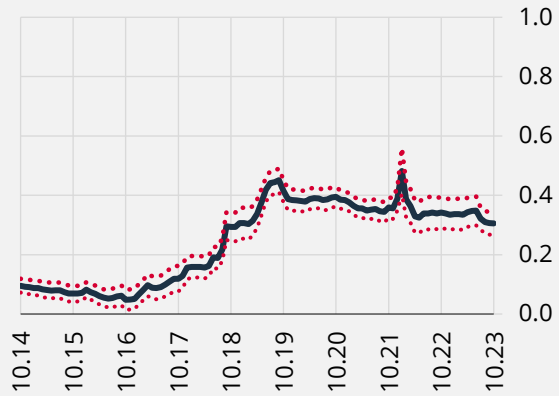
[4] While the response of expectation, in the model including the policy rate, to a 10-point inflation shock at the end of 20th quarter is estimated to be 0.8 points, in the model without the policy rate cumulative response increases to 1.9 points. Cumulative response of expectations to the exchange rate shock increases to 1.8 points in the model without the policy rate from 1.5 points. Response to the Brent crude oil shock increases to 0.6 points in the model without the policy rate from 0.5 points and credibility band remains mostly unchanged. In the model without the policy rate, response to the output gap also increases and credibility band shifts upwards to the positive region.

disinflation path earlier. To show the change in the weights attached to inflation outturns and the CBRT inflation forecasts in the formation of inflation expectations over time, we estimate the equation below with the Market Participants Survey micro data for 60-month moving windows:

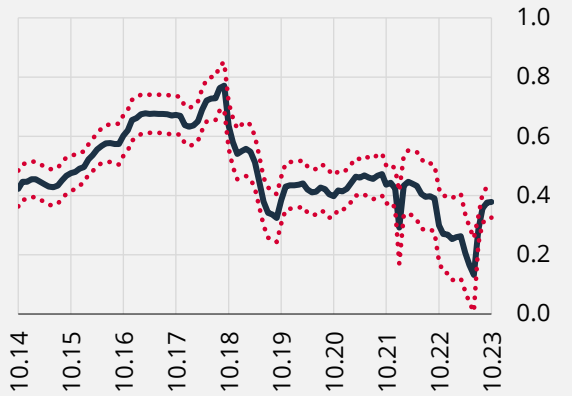
$$\pi_{i,t}^{Expectation} = \alpha\pi_{t-1} + \beta\pi_t^{CBRT\ forecast} + \mu_i + e_{i,t}$$

While $\pi_{i,t}^{Expectation}$ stands for 12-month ahead inflation expectation for each participant, π_{t-1} shows annual inflation reading in the previous month. $\pi_t^{CBRT\ forecast}$ represents the 12-month ahead CBRT forecast published in the latest Inflation Report available to the participants. μ_i shows the participant fixed effect and $e_{i,t}$ measures the unexplained part by the equation. The change in α and β coefficients, which represent respectively the weights of actual inflation figures and CBRT forecasts over time, are displayed in Chart 2 and 3.

Grafik 2: Weight of Actual Inflation in Inflation Expectations
(60-month Moving Window)



Grafik 3: Weight of the CBRT's Inflation Forecasts in Inflation Expectations
(60-month Moving Window)



Model estimation suggests that the sensitivity of inflation expectations to the registered inflation has been high over recent years. On the other hand, the weight attached to the CBRT's inflation forecasts declined starting from the last quarter of 2018 until the Inflation Report 2023-III. With the shift in the approach to forecast as of the Inflation Report 2023-III, inflation forecasts have gained importance in expectation formation of the survey participants and weight attached to inflation outturns has decreased somewhat. In this context, transparent communication of credible inflation forecasts with high information content and accompanying monetary policy strategy to achieve these forecasts will play an important role in anchoring expectations during the disinflation process.

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