

Box 2.2

Macro Components of Consumer Inflation

In the third quarter of 2023, annual consumer inflation increased by 23.3 points to 61.5 percent. This rise was mainly attributed to the recent exchange rate developments, higher fuel prices and tax adjustments, while a significant part of this increase stemmed from the changes in the price-setting behavior. Analyses conducted at the CBRT on micro data reveal that the price-setting behavior changes periodically after large shocks, and pass-through of the shocks to inflation fastens (Chart 1). In the third quarter of 2023, the occurrence of multiple shocks in a short period of time and in particular the large and sudden exchange rate shock led to a tendency to react instantly and pull forward in price-setting behavior. Against this background, this Box analyzes the macro components of recent inflation realizations.

To decompose inflation into its components, the models within the CBRT that take price-setting behavior into account during periods of large shocks are used. In addition, vector auto-regression (VAR) models are employed to decompose the indirect effects of international prices on fuel prices. The decomposition of the tax effect is based on the elasticities presented in Zoom-In 2.2 in Inflation Report 2023-III and the historical pass-through effects calculated within the CBRT. In order to decompose the tax and fuel effects in unprocessed food, sub-item-based models within the CBRT were utilized.

In the third quarter of 2023, the exchange rate-driven contribution to consumer inflation increased by 4.3 points compared to the previous quarter to 19.9 percent (Chart 2). This outlook is mainly driven by the 29.5 percent depreciation of the Turkish lira against average exchange rate basket in the third quarter, which is higher than the depreciation in the same period of the previous year (10.4 percent). The recent rapid increases in fuel prices were due to exchange rate, Brent oil price hikes and tax adjustments. Excluding exchange rate-driven increases, the rise in fuel prices, together with its direct and indirect effects, pushed annual consumer inflation up by 4.8 points. In addition to these items, various tax adjustments were announced after July in order to balance the additional financing need arising from the earthquake and increased public expenditures.¹ Excluding fuel taxes, tax adjustments accounted for 2.5 points of the total increase in annual inflation.

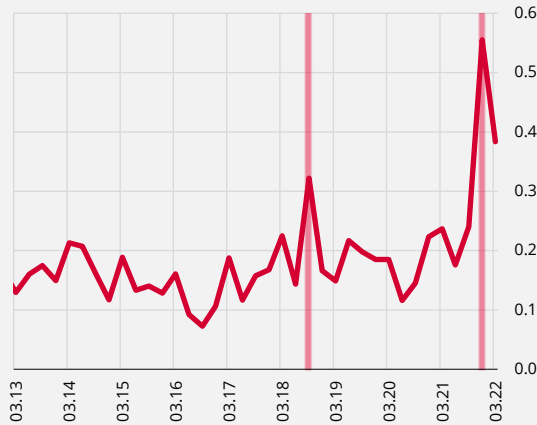
Among other determinants, the unprocessed food group, led by some fresh fruits and vegetables that diverged from seasonal norms due to supply-side effects, and the alcohol-tobacco group, which was driven by increases in producer prices, stand out. Excluding taxes and indirect effects of fuel prices, the contribution of these two main groups to annual consumer inflation rose by 1.0 point to 7.9 points in the third quarter. Unprocessed food and alcohol-tobacco together with demand indicators (credit and output gaps), wages², import prices and constant term accounted for 1.6 points of the rise in annual inflation in total.

Deterioration in pricing behavior also played a significant role in the rise in consumer inflation. Standard econometric models employed in inflation forecasting, which provide reliable results in the long run, have difficulty in predicting the short-term effects of large economic shocks, and the impact of shocks may exceed the levels predicted by these models' forecasts. It is assessed that the occurrence of multiple shocks (exchange rate, wages, taxes, oil price, etc.) in a short period of time led to a significant change in firms' price-setting behavior and inflation expectations. The effects which were expected to be spread over time, were quickly reflected on prices in the third quarter due to the magnitude of the shocks. These effects, which are aggregated under "time dependent price-setting behavior", have increased by 10.1 points to 10.4 points.

¹ CBRT (2023a).

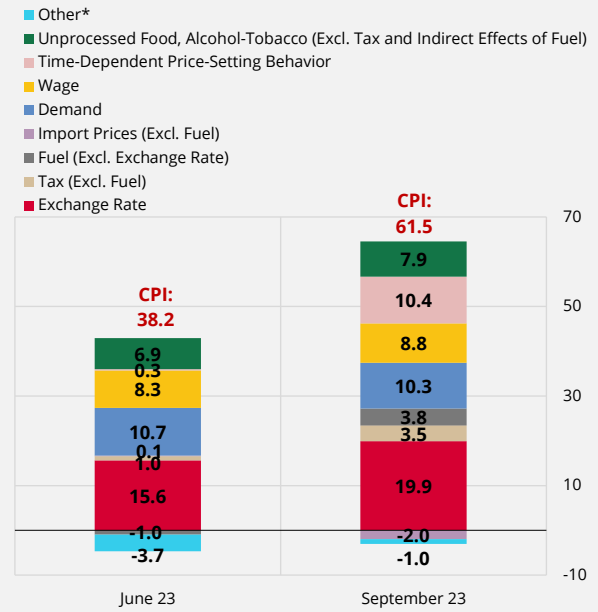
² CBRT (2023b).

Chart 1: Processed Food Average Frequency Change* (%)



Source: Özcan Kodaz and Yürek (2023).
 * Frequency is obtained by dividing the number of price increases seen in the prices of the products monitored during the month by the total number of products. Shaded areas denote periods of high exchange rate shocks.

Chart 2: Annual CPI Inflation Decomposition



Source: CBRT, TURKSTAT.
 * The other item includes constant term, error term and exogenous effects not included in the tax item, such as the 25 m³ natural gas subsidy to households.

In sum, contributing to the recent exchange rate shock, various tax adjustments exerted inflationary pressures, and fuel prices recorded a rapid increase due to the rise in Brent oil prices. In this context, the annual consumer price inflation in September was realized 23.3 points higher than the annual inflation in June. Of this difference, 4.3 points resulted from the depreciation of the Turkish lira, 4.8 points from the direct and indirect effects of the increase in fuel prices excluding exchange rates, 2.5 points from tax adjustments excluding fuel prices and 1.6 points from other determinants. The remaining 10.1 percentage points stemmed from the deterioration in expectations and price-setting behavior due to large and short-term shocks.

References

CBRT (2023a). Impact of tax and administered price adjustments on inflation, Inflation Report 2023-III, Zoom-in 2.2.

CBRT (2023b). An evaluation of the effect of minimum wage increase on inflation, Inflation Report 2023-III, Box 2.6.

Özcan Kodaz, E. F. and Yürek, S. (2023). State-dependency in price adjustments: evidence from large shocks. CBRT Working Paper No. 23/04.