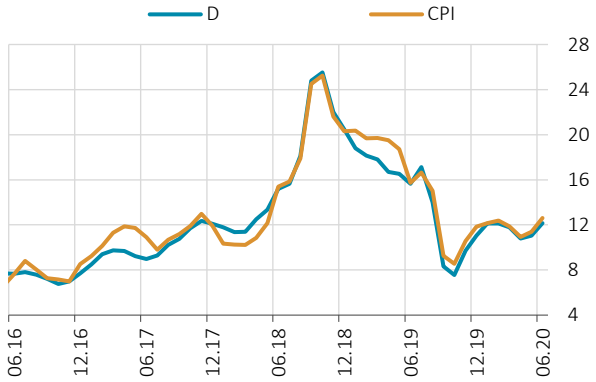
# 3. Inflation Developments

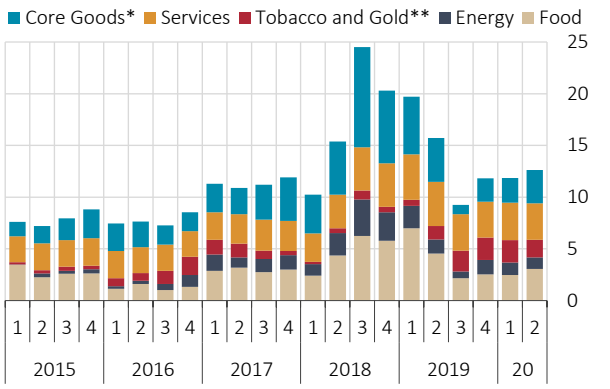
In the second quarter of 2020, consumer inflation increased by 0.76 points to 12.62%, slightly surpassing the upper limit of the forecast range of the April Inflation Report forecast (Chart 3.1). Compared to the previous quarter, core goods and food were the main groups that contributed to the rise in inflation (Chart 3.2). The rise in consumer inflation was mainly driven by the increase in unit costs[1] stemming from the pandemic, cumulative exchange rate effects, and recovery in international oil prices as well as food prices that rose on the back of cyclical and pandemic-induced effects. Against this background, annual inflation and trends in core indicators somewhat increased. Supply-side factors, which have been effective for a short period due to the pandemic-related measures, are expected to phase out as the normalization process continues and demand-driven disinflationary effects are projected to become more evident in the second half of the year.

**Chart 3.1: CPI and D Index*** (YoY % Change)




Source: TURKSTAT.
* CPI excluding unprocessed food, alcoholic beverages and tobacco products.

**Chart 3.2: Contributions to Annual CPI** (% Points)

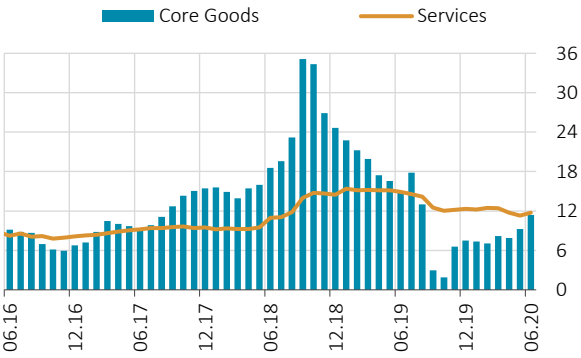



Source: CBRT, TURKSTAT.
* Core Goods: Goods excluding food, energy, alcoholic beverages, tobacco and gold.
** Tobacco and Gold: Alcoholic beverages, tobacco products and gold.

## 3.1 Core Inflation Outlook

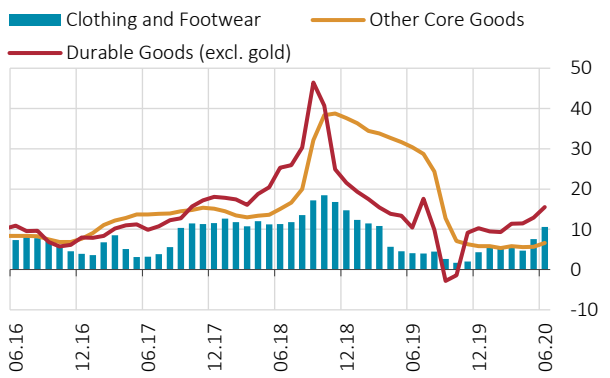
In the second quarter, annual core goods inflation increased by 3.21 points quarter-on-quarter to 11.39% (Chart 3.1.1). While the rise was mainly driven by the cumulative exchange rate effects, the rapid rise in the demand for durable goods stemming from the resurfacing deferred demand, caused by the acceleration in loans, have also supported it. In this quarter, annual inflation rose across the entire group (Chart 3.1.2).

**Chart 3.1.1: Prices of Core Goods and Services** (YoY % Change)




Source: TURKSTAT.

**Chart 3.1.2: Prices of Core Goods** (YoY % Change)




Source: TURKSTAT.

[1] Box 3.1 explains recent unit cost developments.

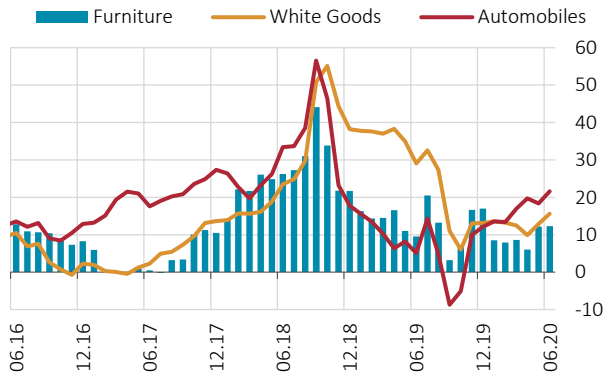
In the second quarter, prices of durable goods increased by 7.38% quarter-on-quarter to 15.54% (Chart 3.1.2). In this quarter, a significant rise was observed in prices of automobiles, white goods and furniture (Chart 3.1.3, Table 3.1.1). While the rise in prices of clothing and footwear group remained significantly lower than historical averages in April due to the pandemic-driven effects, prices in this group increased significantly more than seasonal averages in May and June, and annual inflation in the group was recorded at 10.58%. In sum, annual inflation and trend in core goods increased due to the cumulative exchange rate effects, the rise in unit costs due to the pandemic, and the rise in demand for certain groups in tandem with the normalization process (Chart 3.1.4).

**Table 3.1.1: Prices of Goods and Services** (3-Month and YoY % Change)

| | 2019 | | | | 2020 | | |
|---|---|---|---|---|---|---|---|
| | II | III | IV | Annual | I | II | Annual |
| **CPI** | **2.69** | **3.24** | **3.15** | **11.84** | **2.29** | **3.39** | **12.62** |
| **1.Goods** | 2.29 | 3.07 | 3.96 | 11.65 | 1.81 | 3.53 | 12.94 |
| **Energy** | **0.20** | **6.64** | **5.57** | **10.98** | **-2.66** | **-0.42** | **9.12** |
| **Food and Non-Alcoholic Beverages** | **-1.45** | **-2.46** | **4.86** | **10.89** | **9.18** | **1.12** | **12.93** |
| Unprocessed Food | -8.46 | -8.24 | 6.16 | 6.10 | 15.88 | -0.53 | 12.29 |
| Processed Food | 6.28 | 3.03 | 3.75 | 15.39 | 3.23 | 2.77 | 13.41 |
| **Core Goods** | **4.02** | **2.84** | **3.54** | **7.48** | **-2.33** | **7.11** | **11.39** |
| Clothing and Footwear | 8.06 | -2.37 | 12.71 | 4.32 | -10.85 | 12.72 | 10.58 |
| Durable Goods (excl. Gold) | 3.53 | 6.33 | 1.34 | 10.27 | -0.15 | 7.38 | 15.54 |
| Furniture | 0.89 | 11.73 | 2.72 | 16.95 | -6.20 | 4.28 | 12.26 |
| Electrical and Non-Electrical Devices | 0.84 | 3.26 | -0.88 | 2.20 | -0.07 | 5.33 | 7.73 |
| Automobiles | 5.95 | 6.28 | 1.88 | 12.14 | 1.97 | 10.12 | 21.59 |
| Other Durable Goods | 2.59 | 4.50 | 1.85 | 10.71 | 2.13 | 4.47 | 13.56 |
| Core Goods excl. Clothing and Durable Goods | 2.09 | 1.44 | 0.76 | 5.83 | 1.44 | 2.80 | 6.57 |
| **Alcoholic Beverages, Tobacco Products and Gold** | **14.86** | **18.77** | **0.00** | **39.10** | **1.79** | **4.98** | **26.91** |
| **2. Services** | **3.67** | **3.66** | **1.17** | **12.30** | **3.40** | **3.06** | **11.76** |
| Rent | 2.28 | 3.09 | 1.88 | 10.05 | 2.51 | 1.45 | 9.22 |
| Restaurants and Hotels | 5.49 | 3.76 | 0.74 | 13.17 | 3.11 | 3.12 | 11.13 |
| Transport | 4.91 | 9.00 | 0.32 | 15.03 | 1.70 | 7.64 | 19.70 |
| Communication | 0.77 | 0.63 | 3.84 | 6.92 | 0.18 | 0.77 | 5.48 |
| Other Services | 3.32 | 2.91 | 0.74 | 13.40 | 5.64 | 2.88 | 12.68 |

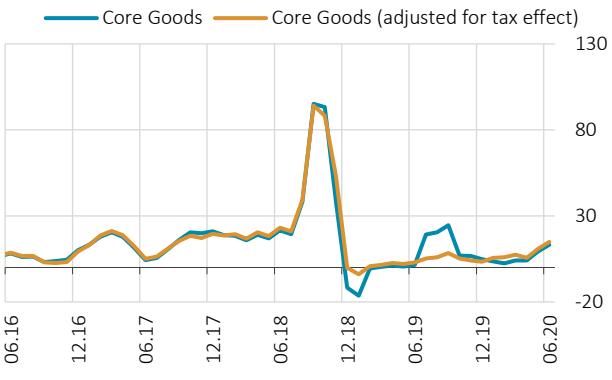
Source: TURKSTAT.

**Chart 3.1.3: Selected Durable Goods Prices** (YoY % Change)




Source: CBRT, TURKSTAT.

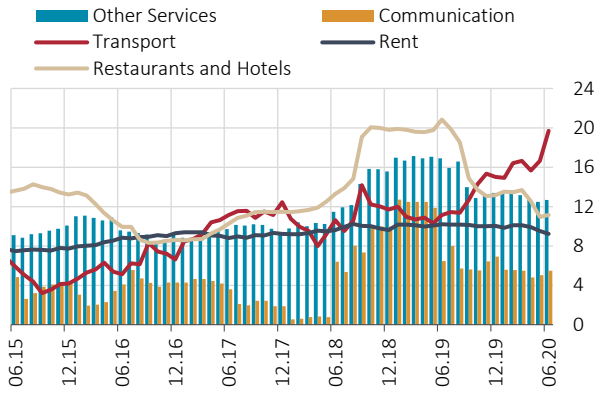
**Chart 3.1.4: Prices of Core Goods** (Seasonally-Adjusted, Annualized 3-Month Average % Change)




Source: CBRT, TURKSTAT.

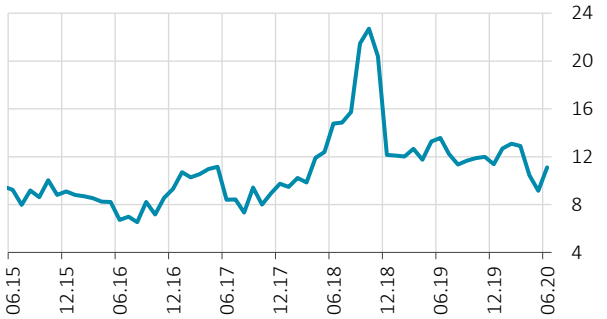
In the second quarter, services prices rose by 3.06%, whereas annual inflation in this group dropped by 0.66 points to 11.76% (Chart 3.1.1 and Table 3.1.1). In the services group, there have been significant developments in prices of items affected by interruptions due to the pandemic. Accordingly, following a moderate course in April, prices in services groups that were subject to capacity limitations such as transportation, food and beverage services, accommodation, barber and hairdressing services displayed significant increases after the normalization steps. While annual inflation decreased in restaurants-hotels, other services and rents groups, it remained flat in communication services but significantly increased in the transport group (Chart 3.1.5). In this quarter, economic activity was interrupted because of the measures taken to counter the pandemic, thus, the main trend of services inflation decreased in April and May and rised in June again (Chart 3.1.6).

**Chart 3.1.5: Prices of Services by Subcategories** (YoY % Change)




Source: TURKSTAT.

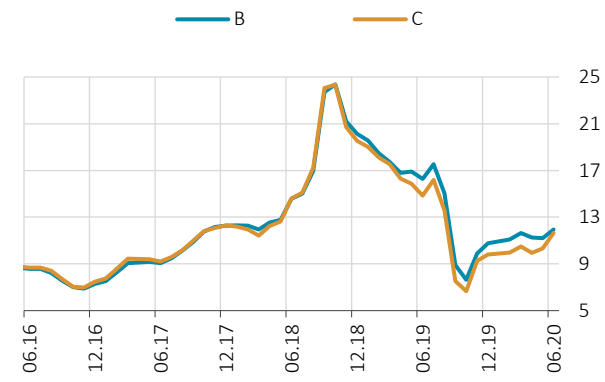
**Chart 3.1.6: Prices of Services** (Seasonally-Adjusted, Annualized 3-Month Average % Change)




Source: CBRT, TURKSTAT.

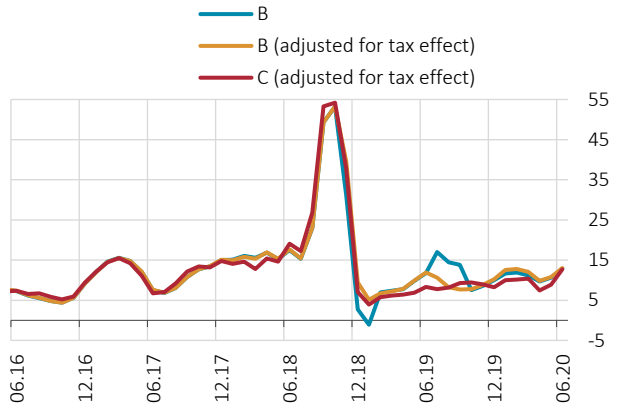
Among core inflation indicators, annual inflation in B and C indices rose by 0.30 and 1.15 points quarter-on-quarter to 11.95% and 11.64%, respectively (Chart 3.1.7). Seasonally adjusted three-month averages suggest that the trend of core inflation indicators moved upward (Chart 3.1.8).

**Chart 3.1.7. Indices B and C** (YoY % Change)




Source: TURKSTAT.

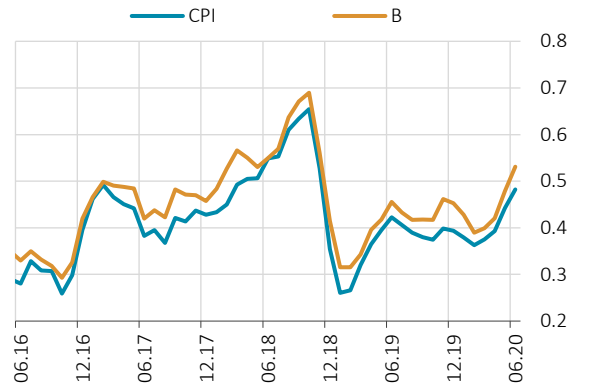
**Chart 3.1.8. Indices B and C** (Seasonally Adjusted, Annualized 3-Month Average % Change)




Source: CBRT, TURKSTAT.

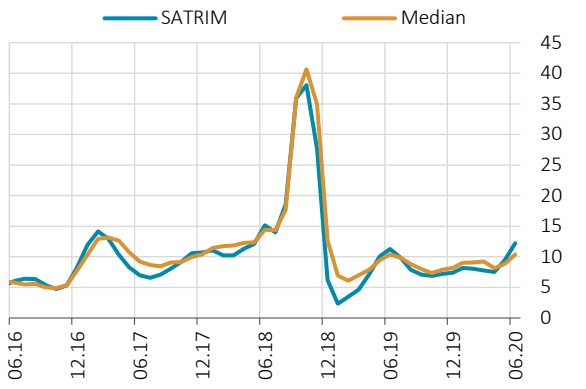
Diffusion indices for CPI and core indicators suggest that the tendency to increase prices moved slightly upward compared to the previous quarter (Chart 3.1.9). Moreover, the underlying trends of alternative core inflation indicators, Median and SATRIM confirmed the rise in annual inflation (Chart 3.1.10).

**Chart 3.1.9. CPI and B Diffusion Indices** (Seasonally-Adjusted 3-Month Average)




Source: CBRT, TURKSTAT.

**Chart 3.1.10. Core Inflation Indicators SATRIM* and Median**** (Annualized 3-Month Average, %)

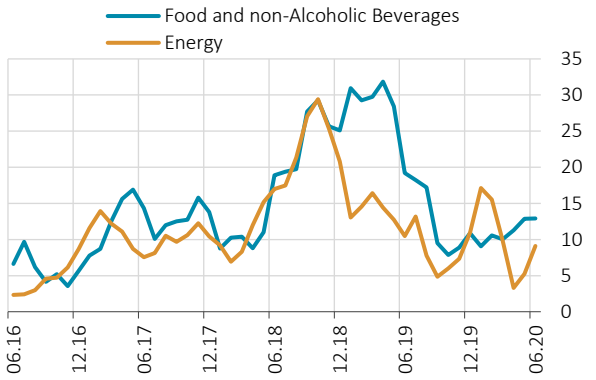



Source: CBRT, TURKSTAT.
*SATRIM: Seasonally adjusted, trimmed mean inflation.
**Median: Median monthly inflation of seasonally adjusted 5-digit subprice indices.

## 3.2 Food, Energy and Alcohol-Tobacco Prices

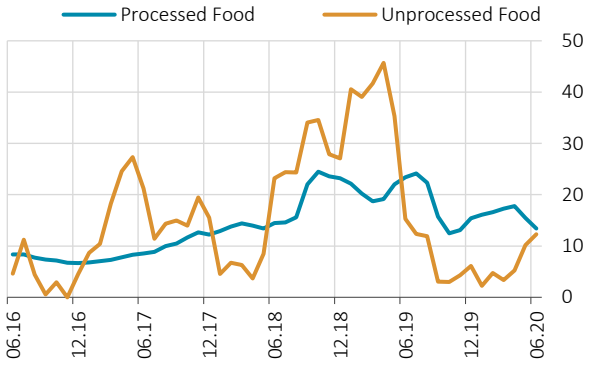
Annual inflation in food and non-alcoholic beverages was up 2.88 points to 12.93% in the second quarter (Chart 3.2.1). This rise was mainly driven by unprocessed food prices led by fresh fruits and vegetables prices, while annual inflation in processed food decreased (Chart 3.2.2).

**Chart 3.2.1: Food and Energy Prices** (YoY % Change)




Source: TURKSTAT.

**Chart 3.2.2: Food Prices** (YoY % Change)

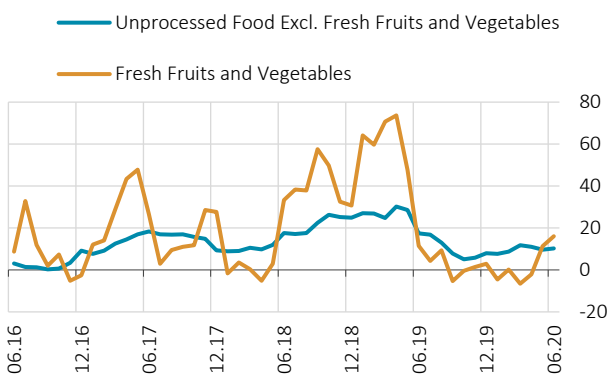



Source: TURKSTAT.

In the second quarter of the year, annual unprocessed food inflation rose by 8.96 points to 12.29% (Chart 3.2.2). While annual fresh fruits and vegetables inflation increased by 22.65 points to 16.09%; inflation in the other unprocessed food group dropped by 1.49 points to 10.30% (Chart 3.2.3). Red meat prices, which displayed a significant rise in the first quarter, remained favorable in the second quarter. Meanwhile, pulses, which have a large import share in total supply, continued to display significant price increases, curbing further decline in inflation in the other unprocessed food group (Chart 3.2.4).

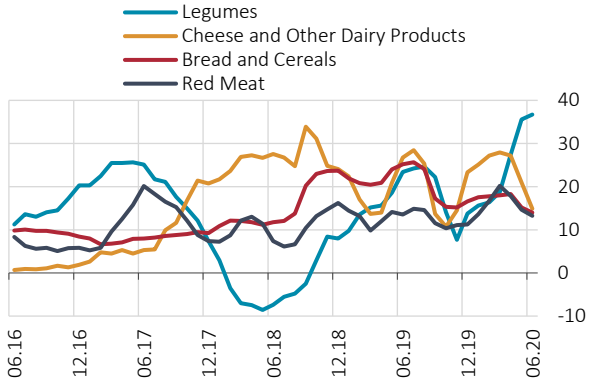
Annual processed food inflation dropped by 3.87 points to 13.41% in the second quarter (Chart 3.2.2). While the favorable outlook observed in the processed food was prevalent across the group, the most remarkable contribution to the decline in annual inflation in this group came from cheese and other dairy products. Meanwhile, annual inflation in bread and cereals, which make up a large percentage of processed foods and rose in the first quarter, slightly decreased in the second quarter thanks to the more moderate rise in this quarter (Chart 3.2.4).

Chart 3.2.3: Prices of Fresh Fruits and Vegetables and Other Food (YoY % Change)




Source: CBRT, TURKSTAT.

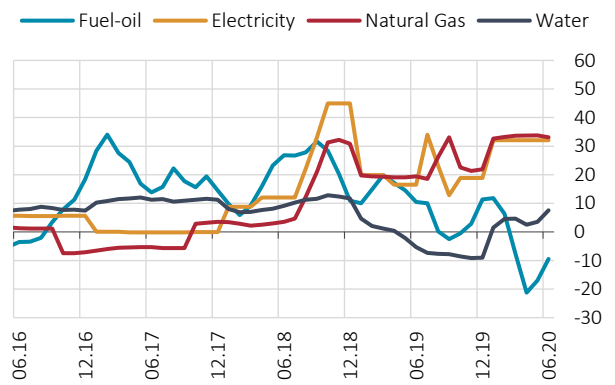
Chart 3.2.4: Selected Food Items (YoY % Change)




Source: CBRT, TURKSTAT.

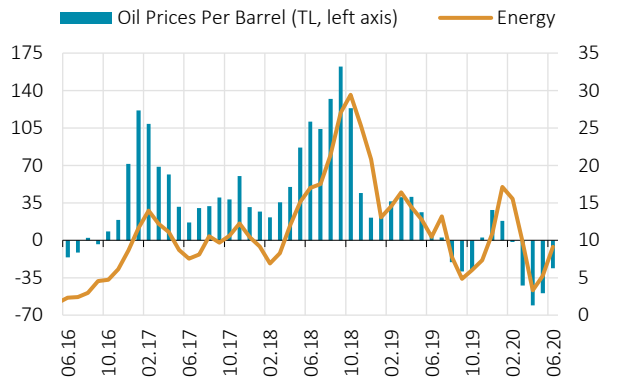
Energy prices decreased by 0.42% in the second quarter of the year (Table 3.1.1). The average Brent crude oil price per barrel, which was USD 33 at the end of the previous quarter, decreased to USD 23 in April and increased to USD 40 at the end of the quarter again. In this framework, prices of fuel and bottled gas, which decreased by 12.8% and 11.3% respectively in April, increased by 13.3% and 7.5% respectively in the May-June period. Thus, annual energy inflation, which dropped to 3.30% in April, increased to 9.12% owing to the price increments over the last two months (Chart 3.2.5 and Chart 3.2.6).

Chart 3.2.5: Domestic Energy Prices (YoY % Change)




Source: TURKSTAT.

Chart 3.2.6: Energy Prices (YoY % Change)




Source: Bloomberg, CBRT, TURKSTAT.

In the second quarter, tobacco prices increased by 1.62% due to the rise in the minimum lump sum special consumption tax in May. In early July, the lump sum and minimum lump sum special consumption taxes on tobacco and alcohol increased in line with the automatic adjustment.

## 3.3 Domestic Producer Prices

In the second quarter, domestic producer prices (D-PPI) were up 3.56%, while annual D-PPI inflation decreased by 2.33 points quarter-on-quarter to 6.17% on the back of the high base effect (Table 3.3.1 and Chart 3.3.1).

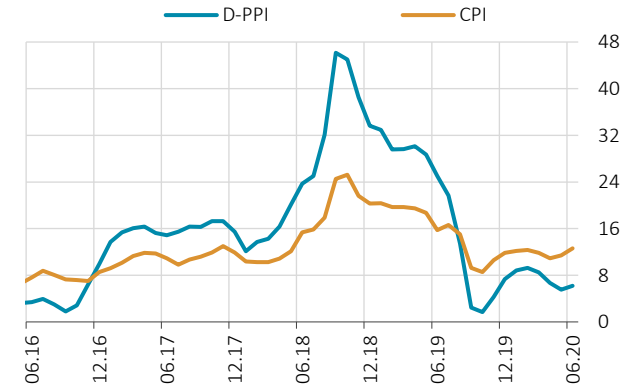
Table 3.3.1: D-PPI and Sub-Categories (3-Month and YoY % Change)

| | 2019 | | | | 2020 | | |
|---|---|---|---|---|---|---|---|
| | II | III | IV | Annual | I | II | Annual |
| **D-PPI** | **5.83** | **-1.45** | **0.78** | **7.36** | **3.22** | **3.56** | **6.17** |
| Mining | 5.92 | -0.59 | 1.78 | 13.31 | 3.47 | -0.49 | 4.19 |
| Manufacturing | 5.34 | -1.89 | 0.82 | 6.98 | 3.45 | 3.58 | 5.99 |
| Manufacturing excl. Petroleum Products | 5.51 | -1.82 | 0.75 | 6.90 | 4.78 | 3.78 | 7.56 |
| Manufacturing excl. Petroleum and Base Metal Products | 5.49 | -1.25 | 1.13 | 8.09 | 4.30 | 3.72 | 8.03 |
| Production and Distribution of Electricity and Gas | 14.30 | 3.88 | -0.08 | 12.43 | -0.47 | 5.90 | 9.40 |
| Water Supply | -1.74 | 0.91 | 0.55 | -7.94 | 5.83 | -0.07 | 7.30 |
| **D-PPI by Main Industrial Groupings** | | | | | | | |
| Intermediate Goods | 4.87 | -2.28 | -0.29 | 4.27 | 4.76 | 3.99 | 6.14 |
| Durable Consumption Goods | 2.97 | 1.94 | 0.77 | 7.25 | 5.34 | 4.46 | 13.04 |
| Durable Consumption Goods (excl. jewelry) | 2.72 | 1.71 | 0.85 | 6.63 | 4.39 | 3.26 | 10.57 |
| Non-Durable Consumption Goods | 7.79 | -1.85 | 2.46 | 11.93 | 4.47 | 2.80 | 8.00 |
| Capital Goods | 3.67 | -0.64 | 1.14 | 8.09 | 5.58 | 5.16 | 11.57 |
| Energy | 8.54 | 0.82 | 0.86 | 9.02 | -8.01 | 1.56 | -5.00 |

Source: CBRT, TURKSTAT.

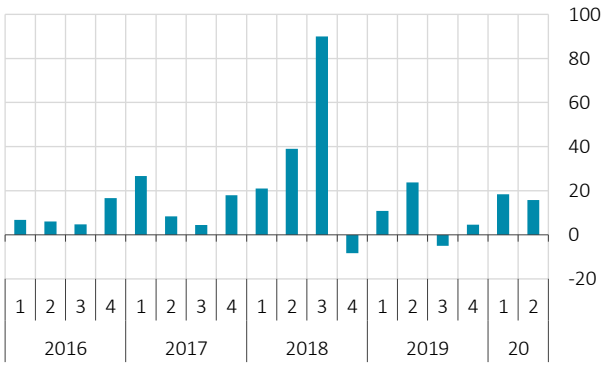
By main industrial groupings, prices increased in all sub-categories (Table 3.3.1). Despite the significant decrease in April, energy prices picked up again over the last two months owing to the rebound in international oil prices. Meanwhile, the strong rise observed in prices of intermediate goods as well as in capital and consumer goods in the first quarter continued in the second quarter as well. Even though the uptrend in prices in manufacturing industry excluding petroleum and base metal, which contains information on the underlying trend of producer prices, slowed down quarter-on-quarter, it remained high (Chart 3.3.2). Therefore, the producer prices-driven pressure on consumer prices continued.

Chart 3.3.1: Domestic Producer and Consumer Prices (YoY % Change)




Source: TURKSTAT.

Chart 3.3.2: Manufacturing Prices excl. Petroleum and Base Metals (Seasonally-Adjusted, Annualized QoQ % Change)

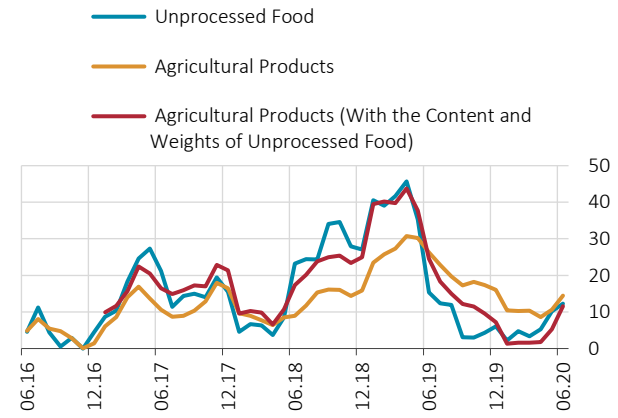



Source: CBRT, TURKSTAT.

# 3.4 Agricultural Producer Prices

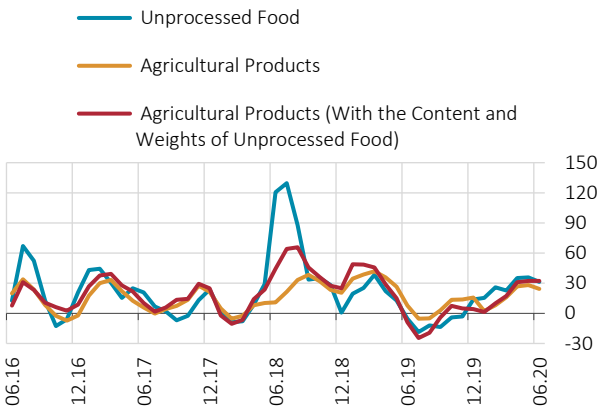
In the second quarter of 2020, annual inflation in agricultural producer prices increased by 4.12 points quarter-on-quarter to 14.50% (Chart 3.4.1). In this quarter, annual inflation in vegetables and dried beans increased while dropped in wheat and corn prices. The uptrend in sunflower prices continued while prices of livestock remained flat. Looking at agricultural producer prices calculated by contents and weights of unprocessed food, it is observed that annual inflation in this group has increased in tandem with unprocessed food (Chart 3.4.1). Seasonally adjusted three-month averages reveal that the trends of agricultural producer prices and unprocessed food prices were higher compared to the previous quarter (Chart 3.4.2).

**Chart 3.4.1: Prices of Agricultural Products and Unprocessed Food** (YoY % Change)




Source: CBRT, TURKSTAT.

**Chart 3.4.2: Prices of Agricultural Products and Unprocessed Food** (Seasonally-Adjusted, Annualized 3-Month Average % Change)

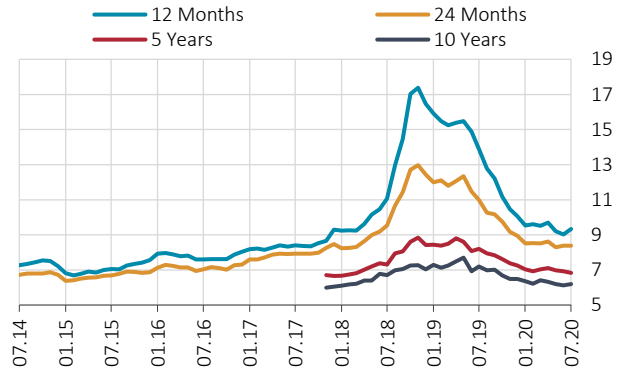



Source: CBRT, TURKSTAT.

# 3.5 Expectations

The downtrend in 12-month-ahead inflation expectations continued in June and slightly increased in July. In this quarter, the year-end inflation expectation was 10.22%, while the 12-month and 24-month-ahead inflation expectations were 9.33% and 8.38%, respectively (Chart 3.5.1). Compared to the previous quarter, upward revisions in the inflation curve are for the short term and there has been no remarkable change in the medium-term expectations (Chart 3.5.2).

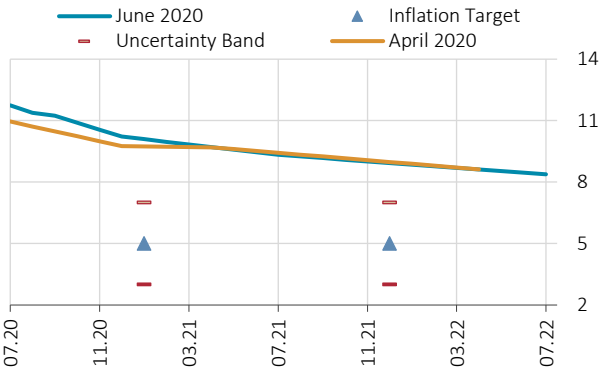
**Chart 3.5.1: CPI Inflation Expectations*** (%)




Source: CBRT.

* Results of the CBRT Survey of Expectations that polls corporate sector and financial sector representatives as well as professionals.

**Chart 3.5.2: Medium-Term Inflation Expectations Curve*** (%)

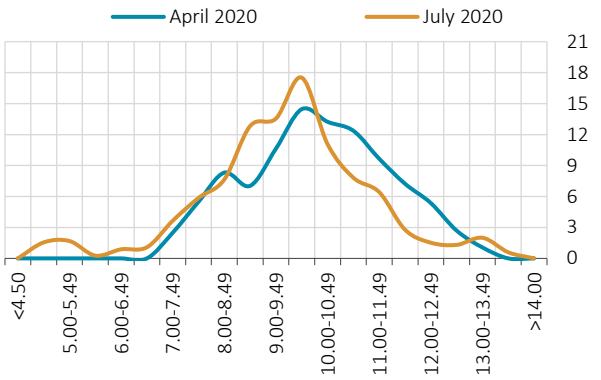



Source: CBRT.

* Calculated by linear interpolation of expectations for different time spans using the CBRT Survey of Expectations that polls corporate sector and financial sector representatives as well as professionals.

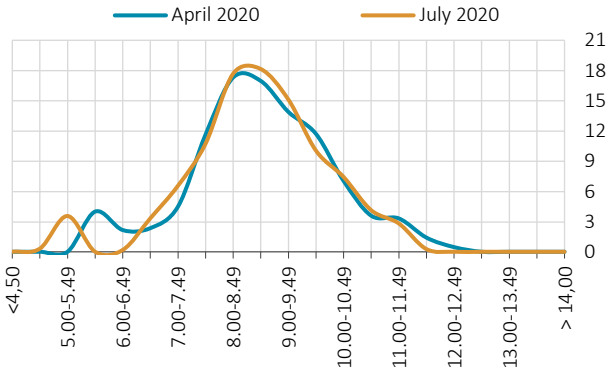
Probability distributions of 12 month-ahead inflation expectations shifted slightly leftward converging to the normal distribution while the same for 24-month-ahead displayed no significant change compared to April (Chart 3.5.3 and Chart 3.5.4).

**Chart 3.5.3: Probability Distribution of 12-Month-Ahead Inflation Expectations* (%)**




Source: CBRT.
* Horizontal axis denotes the expected inflation rate, while the vertical axis denotes the respective probability. For further details, see Statistics/Tendency Surveys/Survey of Expectations/Metadata at the CBRT's website.

**Chart 3.5.4: Probability Distribution of 24-Month-Ahead Inflation Expectations* (%)**




Source: CBRT.
* Horizontal axis denotes the expected inflation rate, while the vertical axis denotes the respective probability. For further details, see Statistics/Tendency Surveys/Survey of Expectations/Metadata at the CBRT's website.

# Box 3.1

## An Evaluation of Recent Unit Cost Developments

Unit cost is defined as the average cost per unit of total goods and services produced in an economy. A gradual normalization in supply and demand conditions has taken place recently after the sharp decline in production and sales due to the pandemic. This makes the concept of unit cost a current issue due to fixed costs. When the adaptation in cost factors, labor, rent and energy in particular, does not accompany the decline in economic activity in the short term, unit costs increase as a result. The recent price increases, especially in sectors such as catering, accommodation, transportation and personal care services that are subject to capacity constraints in the gradual normalization, can be evaluated in this context. Although this box addresses the concept of unit cost over labor costs, similar inferences can be made for all cost factors that affect profitability and pricing behavior, such as non-variable input costs and debt service.

The real unit labor cost is calculated by multiplying the amount of labor used for a unit of production by the real labor cost. The two main components of this indicator can also be expressed as real labor cost per person and partial labor productivity (production amount / employment):

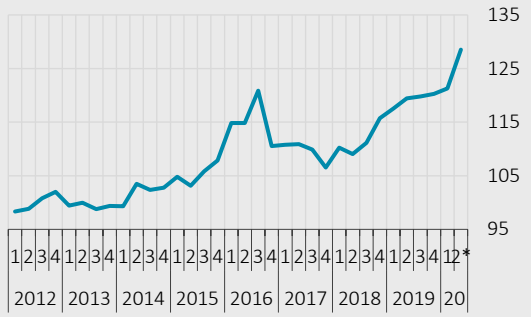
$$Real\ Unit\ Labor\ Cost^{1} = \frac{Total\ Labor\ Cost}{Total\ Production\ Value} = \frac{Labor\ Cost\ per\ Person}{Price} * \frac{Employment}{Production}$$

Accordingly, when the increase in the real labor cost is larger than the increase in productivity, the unit labor cost increases and exerts an upward pressure on inflation. When the real labor cost increase is compensated for by a productivity increase, the real unit labor cost does not change. In historical terms, significant increases in real unit labor costs are observed in 2016 and 2019 when nominal wage adjustments were high, or in periods such as the global financial crisis period when economic activity and productivity declined. In times of production decline, the adaptation in the labor market may be slower and limited compared to the goods and services market, in which case the per capita production (partial labor productivity) decreases. Given the sticky wages, this loss of productivity causes an increase in real unit wages. A similar picture is predicted to have appeared in the second quarter of 2020 when economic activity weakened significantly due to the pandemic (Chart 1).

When the components of this increase predicted in the real unit labor cost are analyzed, it can be seen that contrary to previous periods, the sharp contraction in production has played a significant role. The fact that the decrease in employment is limited compared to production results in a decrease in partial labor productivity and an increase in the real unit labor cost (Chart 2). It should be noted at this point that measures to protect formal employment, particularly the short-term employment allowance, limit the increase in labor cost calculated here.

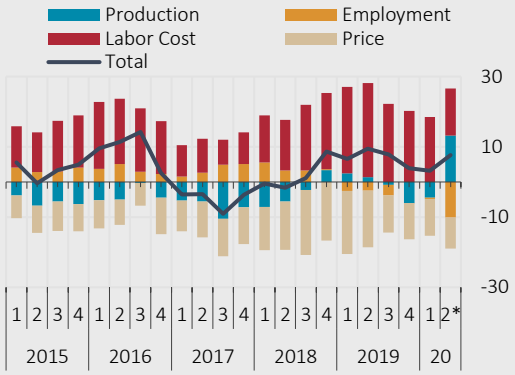
[1] In the calculations, the production variable stands for Non-Agricultural GDP; employment is the Non-Agricultural Employment from the Household Labor Force Survey, labor cost stands for the Hourly Labor Cost data from TURKSTAT's Labor Cost and Earnings Statistics, and Non-Agricultural GDP deflator is used for the price variable.

**Chart 1: Real Unit Labor Cost** (2012=100)




Sources: CBRT, TURKSTAT. *Forecast.

**Chart 2: Real Unit Labor Cost and Its Contribution** (YoY % Change, % Point)




Sources: CBRT, TURKSTAT. *Forecast.

In addition to the real unit labor cost, additional costs specific to the pandemic period may also be effective in pricing behavior. Besides increased logistics costs and spending on hygiene and health products due to supply-side problems and pandemic measures, factors such as debt service in periods of sharply declining cash flows can also be determinant in inflation dynamics and limit the disinflationary effect of demand conditions in the short term. Unit cost increases due to capacity constraints also play an important role in the recent price increases in the sectors whose activities were interrupted and then gradually normalized with various restrictions (Table 1).

**Table 1: Selected Subgroups of Services** (Seasonally Adjusted, Monthly % Change)

| | January-March 2020* | April 2020 | May 2020 | June 2020 |
|---|---|---|---|---|
| Catering services | 1.1 | 0.2 | 0.0 | 2.5 |
| Accommodation services | 0.5 | -0.6 | -0.1 | 1.4 |
| Intercity passenger transport by road | 1.4 | -0.5 | 8.2 | 20.0 |
| Passenger transport by air | 0.8 | -2.5 | -1.3 | 9.4 |
| Hairdressing and personal grooming services | 1.5 | -0.4 | 6.6 | 3.1 |

Sources: CBRT, TURKSTAT.
* Monthly averages are taken.

In conclusion, there has been some increase in the trend of core inflation indicators recently due to the decline in production and sales as well as to the impact of unit cost increases driven by the measures against the pandemic. It is projected that with the continuation of the normalization process, the capacity constraints will be alleviated, and accordingly, the supply-side factors that have been effective in the short term due to the pandemic measures will gradually disappear.