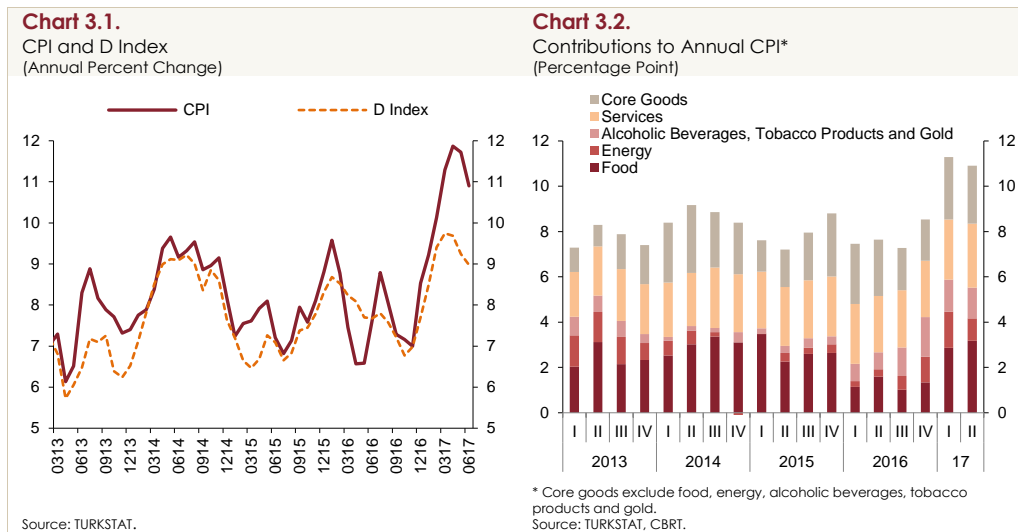


### 3. Inflation Developments

Edging down by 0.39 points quarter-on-quarter to 10.90 percent, consumer inflation remained elevated in the second quarter (Chart 3.1). The depreciation of the Turkish lira since October and the acceleration in food prices as of December as well as the increases in oil prices and tax adjustments in the last quarter of 2016 caused consumer inflation to trend upwards since December and near 12 percent in April. On the other hand, inflation experienced a slight slowdown in May and June owing to the falling annual inflation in energy and core goods amid the decline in oil prices and the recent appreciation of the Turkish lira. In this period, import prices receded in Turkish lira terms and the rate of increase in producer prices slowed substantially following the robust course in the preceding two quarters. However, producer prices driven pressures on consumer prices remained brisk due to past cumulative effects. Moreover, as economic activity picked up, demand conditions offered less support to disinflation in the second quarter. The ongoing deterioration in medium-term inflation expectations was replaced by a relatively flat course in the second quarter, yet expectations still remained high.



Across subcategories, food inflation rose owing mainly to fresh fruits and vegetables until May, and receded in June due to the base effect. In this subcategory, red meat prices tended to increase in the first half of the year and prices accelerated substantially in the second quarter. Being subject to relatively a rapid pass-through, energy prices recorded a decline in the last four months amid the recent developments in oil prices and the exchange rate. In the second quarter, core goods inflation also lost some momentum, which was led by temporary effects stemming from the methodological change in the weighting system of clothing prices.<sup>1</sup> On the other hand, lagged effects of the cumulative depreciation of the Turkish lira on consumer inflation continued through core goods excluding clothing and durables, and annual inflation in this subcategory remained on the rise. Services inflation registered an uptick due to transport services, which are influenced by lagged effects of fuel price hikes, in addition to the catering services channel, which witnessed indirect effects of the surge in food inflation, mainly

<sup>1</sup> In January 2017, the weighting system used to incorporate fresh fruits and vegetables as well as clothing and footwear products in the CPI was changed from the variable-weight method to the fixed-weight method. For a detailed analysis, see the Box 3.2 in Inflation Report 2017-II and the article titled "Impact of the Change in the Weight Structure of Clothing and Footwear Group on the Underlying Trend of Inflation" published in the CBRT blog.

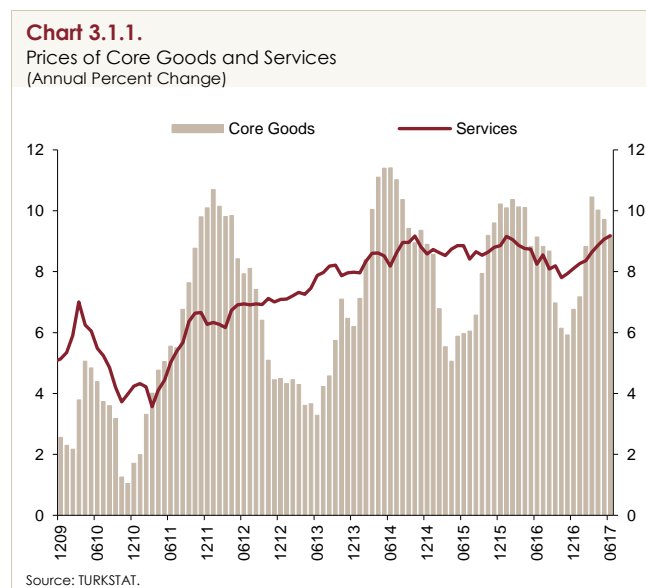
the red meat. Against this background, the rise in the underlying trend of inflation was replaced by a slight slowdown, and annual inflation in core indicators remained elevated with a relatively flat course. In the second quarter, the contribution of food and services to annual consumer inflation was up by 0.3 and 0.2 points, respectively; while that of energy, core goods, alcohol-tobacco and gold was down by 0.6, 0.2 and 0.1 points, respectively (Chart 3.2).

In sum, after a steady uptrend since November, consumer inflation inched down slightly in the second quarter of 2017. Even though the inflation peak is presumably over, inflation is still likely to follow a fluctuating course in the second half of the year. The desired correction in food prices is not complete, thereby necessitating a cautious stance regarding the persistence of the recent decline in the food inflation driven by base effects. Furthermore, temporary tax reductions in white goods and furniture to be taken back in October as well as the methodological changes in clothing may lead to short-term fluctuations in inflation and temporary increases in core inflation. The inflation outlook is projected to witness a recovery as of year-end, which is expected to be more pronounced in early 2018.

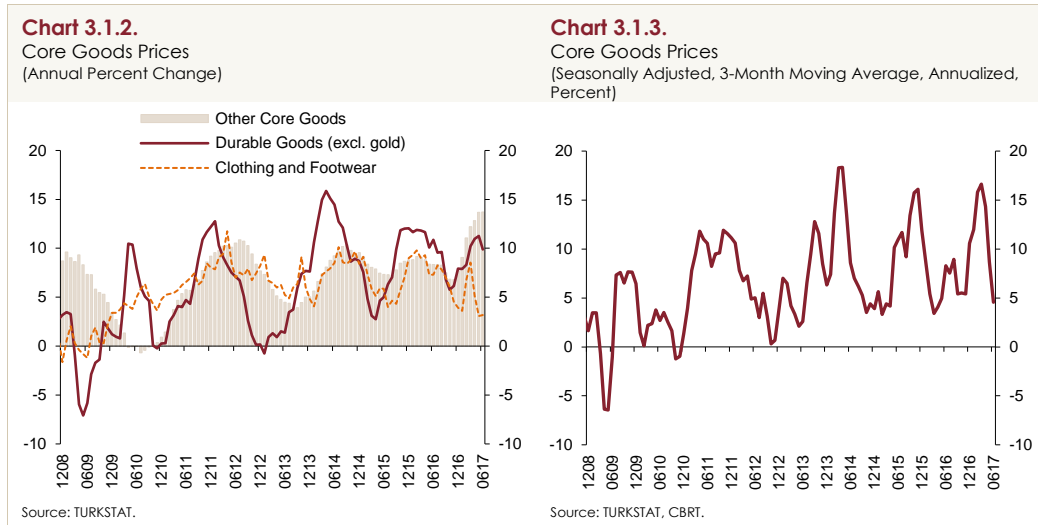
### 3.1. Core Inflation Outlook

Annual core goods inflation fell by 1.25 points to 9.20 percent in the second quarter (Table 3.1.1, Chart 3.1.1). This was attributed to the temporary effects led by the methodological changes in the weighting system of clothing prices. Price increases in subcategories like durable goods decelerated considerably due to the recent appreciation of the Turkish lira, while other core goods, which were inflicted by lagged effects of the exchange rate, saw further price increases.

Annual clothing inflation plummeted by 5.39 points to 3.15 percent in the second quarter. This was largely driven by the transition from the variable-weight to the fixed-weight method. Estimations suggest that the fixed-weight method points to a lower monthly clothing inflation particularly in April and May, and a higher one in September and October. Accordingly, taking into account these temporary effects in the transition year 2017 is important to make a reliable assessment of both the annual inflation and the underlying trend of inflation.



Prices of durable goods crawled up in the second quarter (Table 3.1.1). Prices in this subcategory picked up on a quarterly basis on account of the furniture prices, while electrical and non-electrical home appliances and automobiles witnessed falling prices. Meanwhile, other core goods excluding clothing and durables, where price adjustments due to exchange rate movements spread across a longer time horizon, registered further sizeable price increases with 2.86 percent in this quarter due to the cumulative effects of the depreciation. This was led by price hikes in items sensitive to the exchange rate such as personal care products, housing maintenance and repair equipment, household materials and parts of transportation vehicles. Thus, annual inflation in other core goods hit the all-time high of 13.72 percent (Chart 3.1.2).



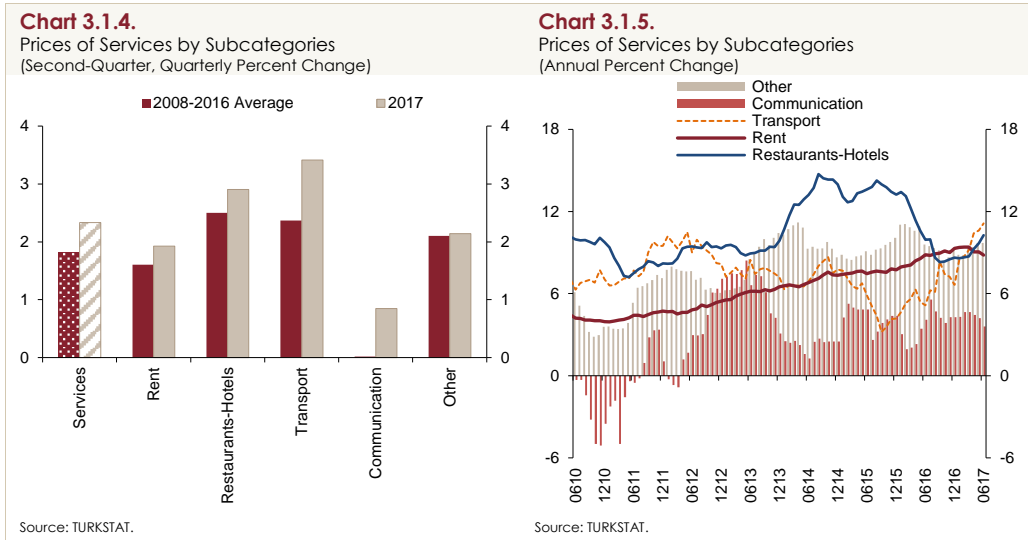
The seasonally adjusted underlying trend of core goods prices reveals an improvement in the second quarter due to the recent course of the Turkish lira and largely the change in the weight structure of the clothing prices (Chart 3.1.3).

**Table 3.1.1.**  
Prices of Goods and Services  
(Quarterly and Annual Percent Change)

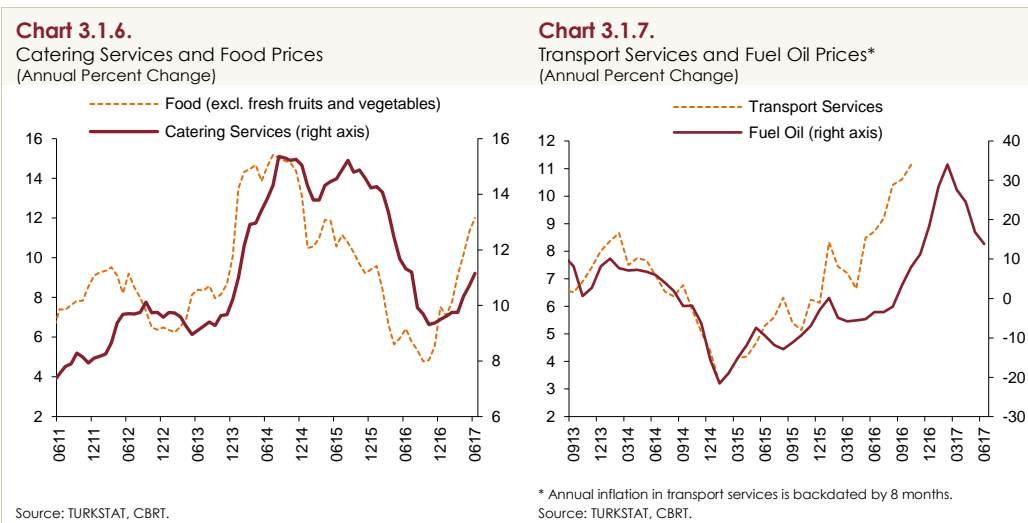
|  | 2016  |        |       |        | 2017  |       |        |
|--|-------|--------|-------|--------|-------|-------|--------|
|  | II    | III    | IV    | Annual | I     | II    | Annual |
| CPI  | 1.84  | 1.05   | 3.64  | 8.53   | 4.34  | 1.49  | 10.90  |
| 1. Goods                                       | 1.85  | 0.32   | 4.83  | 8.72   | 5.01  | 1.12  | 11.67  |
| Energy   | 1.94  | 1.46   | 4.18  | 8.67   | 4.11  | -2.26 | 7.56   |
| Food and Non-Alcoholic Beverages               | -1.97 | 0.46   | 4.51  | 5.65   | 9.34  | -0.39 | 14.34  |
| Unprocessed Food                               | 2.92  | 0.63   | 2.82  | 7.70   | 3.05  | -2.95 | 21.21  |
| Processed Food                                 | 1.00  | 1.25   | 1.46  | 6.67   | 3.39  | 2.17  | 8.53   |
| Core Goods                                     | 5.63  | -2.54  | 4.95  | 6.77   | 2.23  | 4.44  | 9.20   |
| Clothing and Footwear                          | 20.44 | -12.06 | 12.02 | 3.92   | -8.52 | 14.46 | 3.15   |
| Durable Goods (excl. gold)                     | 0.57  | 0.74   | 2.73  | 7.93   | 5.89  | 0.27  | 9.89   |
| Furniture                                      | 1.03  | 0.98   | 0.38  | 8.27   | -2.54 | 1.71  | 0.48   |
| Electrical and Non-Electrical Appliances       | -1.04 | -0.46  | 1.87  | 1.73   | 3.88  | -0.31 | 5.01   |
| Automobile                                     | 1.28  | 1.45   | 4.71  | 12.91  | 10.99 | -0.29 | 17.55  |
| Other Durable Goods                            | 2.40  | 1.11   | 2.02  | 6.55   | 5.78  | 2.99  | 12.38  |
| Core Goods (excl. clothing and durable goods)  | 1.48  | 1.44   | 2.49  | 7.68   | 6.34  | 2.86  | 13.72  |
| Alcoholic Beverages, Tobacco Products and Gold | 0.35  | 10.20  | 6.80  | 31.25  | 4.05  | -0.18 | 22.24  |
| 2. Services                                    | 1.83  | 2.71   | 1.03  | 8.11   | 2.83  | 2.33  | 9.18   |
| Rent   | 2.48  | 2.49   | 2.23  | 9.30   | 1.89  | 1.93  | 8.81   |
| Restaurants-Hotels                             | 1.46  | 2.73   | 1.64  | 8.62   | 2.62  | 2.90  | 10.26  |
| Transport                                      | 1.61  | 4.48   | -1.01 | 6.63   | 3.91  | 3.41  | 11.14  |
| Communication                                  | 1.87  | 1.69   | 0.67  | 4.29   | 0.35  | 0.85  | 3.60   |
| Other Services                                 | 1.84  | 2.47   | 0.91  | 9.15   | 3.87  | 2.14  | 9.70   |

Source: TURKSTAT, CBRT.

Prices of services increased by 2.33 percent in the second quarter, higher than historical averages, and annual services inflation reached 9.18 percent (Charts 3.1.1 and 3.1.4). Across subcategories, quarterly price hikes are remarkable compared to past averages. In this quarter, annual inflation receded in rent and communication, but increased in other subcategories (Chart 3.1.5).



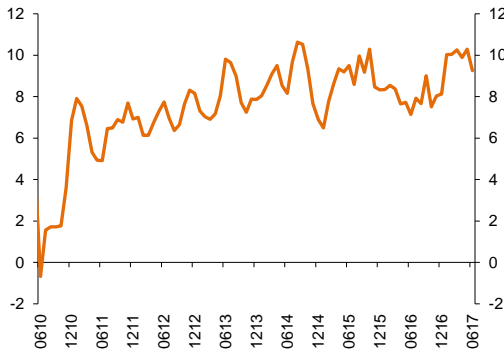
In the second quarter, in addition to the rebound in domestic demand, cost-side factors were influential across services inflation. In restaurants and hotels, prices of catering services were hit by food prices excluding fresh fruits and vegetables, especially red meat, and climbed to 11.16 percent (Chart 3.1.6). In addition, amid the notable cumulative depreciation of the Turkish lira coupled with the partial recovery in the tourism sector, accommodation services inflation also registered increases on an annual basis. In this period, lagged effects of fuel price hikes drove transport services inflation significantly higher (Chart 3.1.7). Meanwhile, on the other services front, the impacts of exchange rate developments on package tour prices as well as those of headline inflation on prices of education services proved remarkable. On the other hand, rent inflation, which is another factor to contribute to escalated services inflation, inched down by 0.6 points to 8.81 percent in the second quarter after having remained elevated for an extended period of time (Chart 3.1.5).



The increase in the annual services inflation notwithstanding, indicators for the underlying trend of services inflation registered a slight slowdown. Both the underlying trend of inflation, which is captured by seasonally adjusted 3-month averages, and the price increasing tendency, which is implied by the diffusion index, recorded a decline in this period (Charts 3.1.8 and 3.1.9). However, the underlying trend of services inflation remained high due also to rising headline inflation and inflation expectations.

**Chart 3.1.8.**

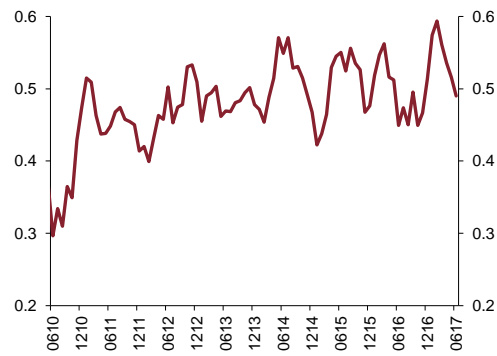
Services Prices  
(Seasonally Adjusted, 3-Month Moving Average, Annualized, Percent)



Source: TURKSTAT, CBRT.

**Chart 3.1.9.**

Diffusion Index for Services Prices\*  
(Seasonally Adjusted, 3-Month Moving Average)

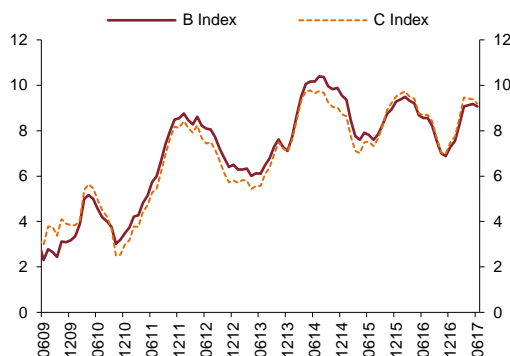


\* Diffusion index is calculated as the ratio of the number of items with increasing prices minus the number of items with decreasing prices to total number of items within a given month.  
Source: TURKSTAT, CBRT.

Against this background, annual inflation in B index remained flat with 9.07 percent, while that in C index inched down to 9.20 percent (Chart 3.1.10).<sup>2</sup> The uptrend in the underlying trend of core inflation indicators, which started in the first quarter, was replaced by a slowdown in the second quarter on the back of the partially waning exchange rate effects. This slowdown was also driven by the methodological change in the weighting structure of seasonal products in clothing and footwear. Estimations indicate that core inflation seems to have improved less when adjusted for this methodological change (Chart 3.1.11).

**Chart 3.1.10.**

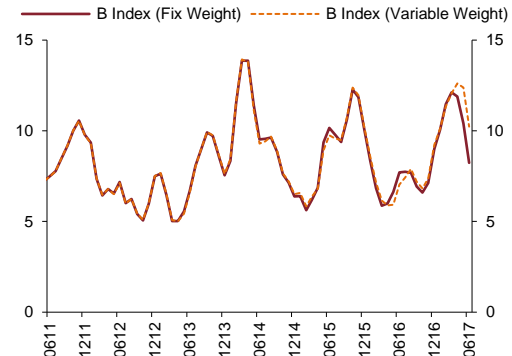
Core Inflation Indicators  
(Annual Percent Change)



Source: TURKSTAT.

**Chart 3.1.11.**

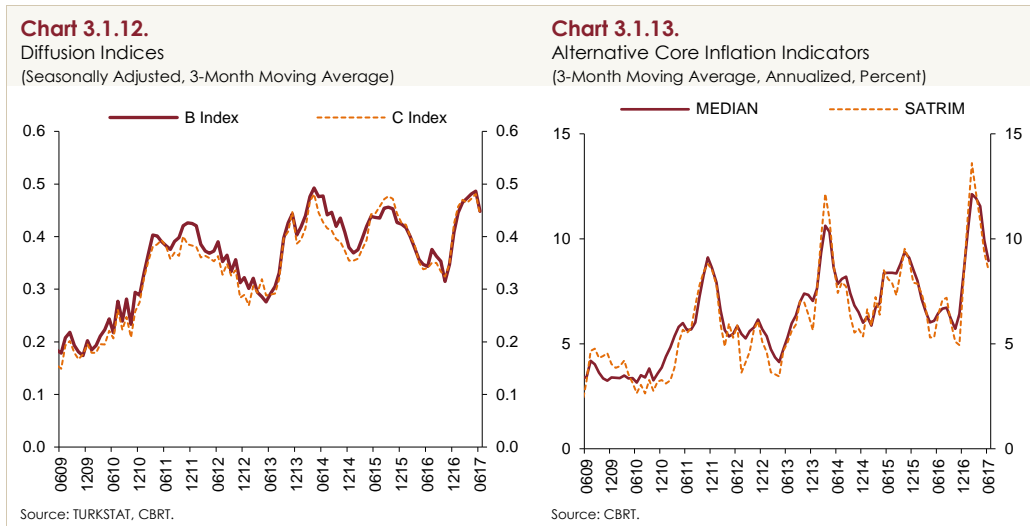
Core Inflation Indicators  
(Seasonally Adjusted, 3-Month Moving Average, Annualized, Percent)



Source: TURKSTAT, CBRT.

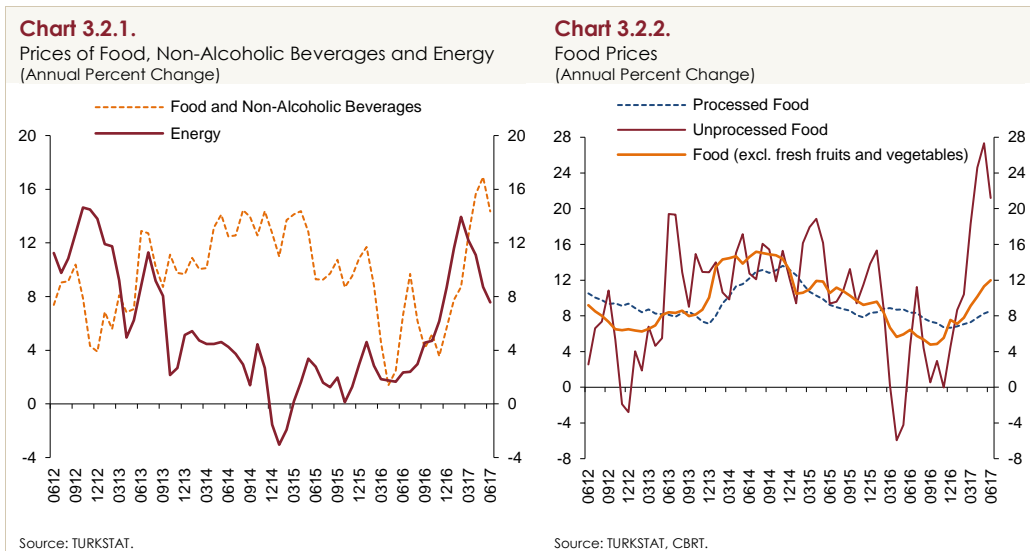
<sup>2</sup> TURKSTAT's previous indices H and I were replaced with the new special indices B and C as of 2017.

In this period, the tendency for price hikes proved rather weaker than the previous quarter as captured by the diffusion indices for core indicators (Chart 3.1.12). SATRIM and MEDIAN, the alternative core inflation indices monitored by the CBRT, also showed a similar pattern (Chart 3.1.13). The joint analysis of the indicators for tendency and pricing behavior shows that the underlying trend of inflation remained high despite a partial improvement.

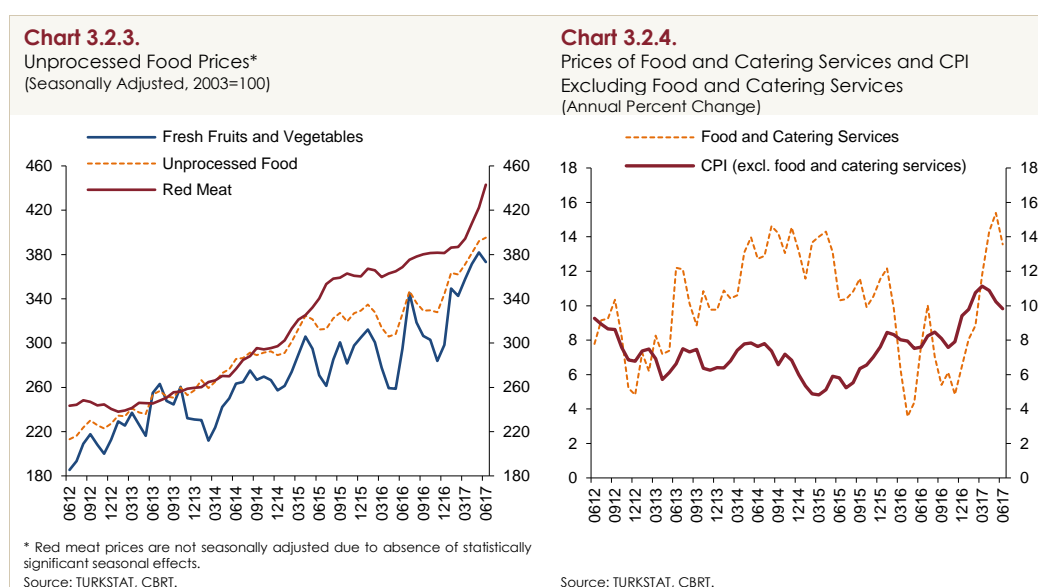


### 3.2. Prices of Food, Energy, Alcoholic Beverages and Tobacco Products

Having soared in the first quarter, annual food inflation rose by 1.81 points to 14.34 in the second quarter (Chart 3.2.1, Box 3.1). Thus, food inflation stood above the level projected in the April Inflation Report.

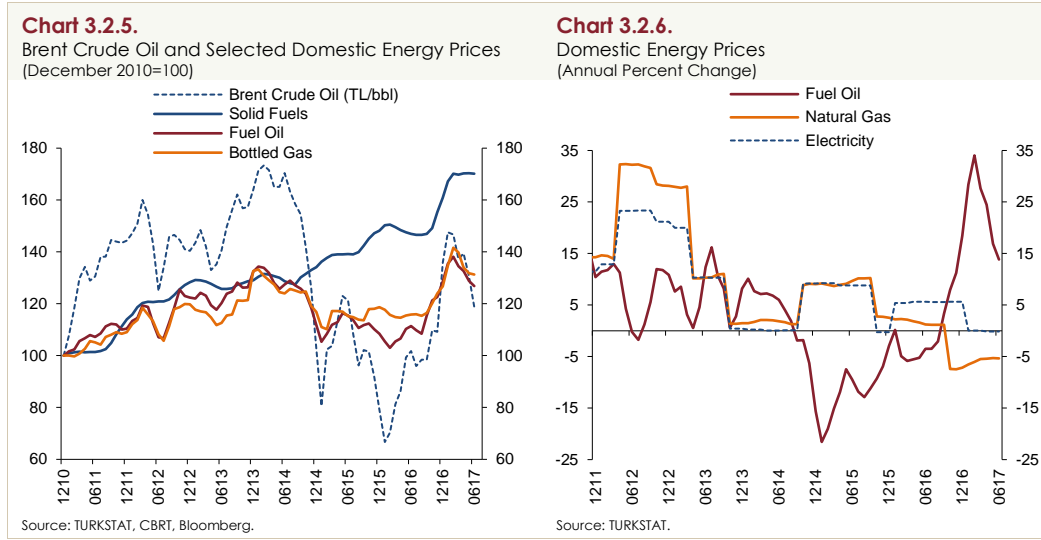


The main driver of food inflation was unprocessed food prices, the annual inflation of which reached 21.21 percent (Chart 3.2.2). Prices in this subcategory were pushed up due to fresh fruits and vegetables until May, but pulled down owing to the base effect in June. In addition to fresh fruits and vegetables, red meat prices stood out with a jump of 12.35 percent on a quarterly basis (Chart 3.2.3). This caused the annual red meat inflation to hit 20.17 percent, which spilled over into the prices of restaurants and hotels. Accordingly, the customs duty tariffs imposed on the imports of livestock and carcass meat were lowered as of end-June. Also, customs duty on crops such as wheat, maize and barley were reduced. Besides red meat, white meat prices have recently registered notable increases as well on account of the rising export demand. Due to the base effects, unprocessed food inflation is likely to decline in July and fluctuate in the remainder of the year.



On the processed food front, annual inflation trended upwards (Chart 3.2.2). Price increases proved strong in April and May, and rather limited in June. Led both by the lagged effects of exchange rate and the Ramadan, increases spilled over into subcategories, while the upsurge in non-alcoholic beverages by 5.47 percent stood out. All in all, annual inflation in food and catering services rose by 1.78 points to 13.57 percent, but decreased by 1.31 points to 9.82 percent in other CPI subcategories in the second quarter (Chart 3.2.4).

Energy prices fell by 2.26 percent over the second quarter (Table 3.1.1). Brent crude oil prices, which were 52 USD per barrel at the end of the last quarter, declined to 47 USD in June following a fluctuating course. In this period, owing to falling oil prices coupled with the appreciation of the Turkish lira against the US dollar, bottled gas and fuel prices registered a decline by 6.07 and 5.70 percent, respectively (Chart 3.2.5). Among administered prices, electricity and natural gas prices displayed a flat course (Chart 3.2.6). As a result, annual energy inflation decreased by 4.62 points to 7.56 percent curbing the consumer inflation (Chart 3.2.1).



### 3.3. Domestic Producer Prices

Domestic producer prices increased by 1.35 percent in the second quarter. Thus, the rate of price increase lost considerable pace following the robust course in the preceding two quarters. Annual D-PPI inflation fell by 1.22 points compared to the previous quarter to 14.87 percent (Table 3.3.1, Chart 3.3.1).

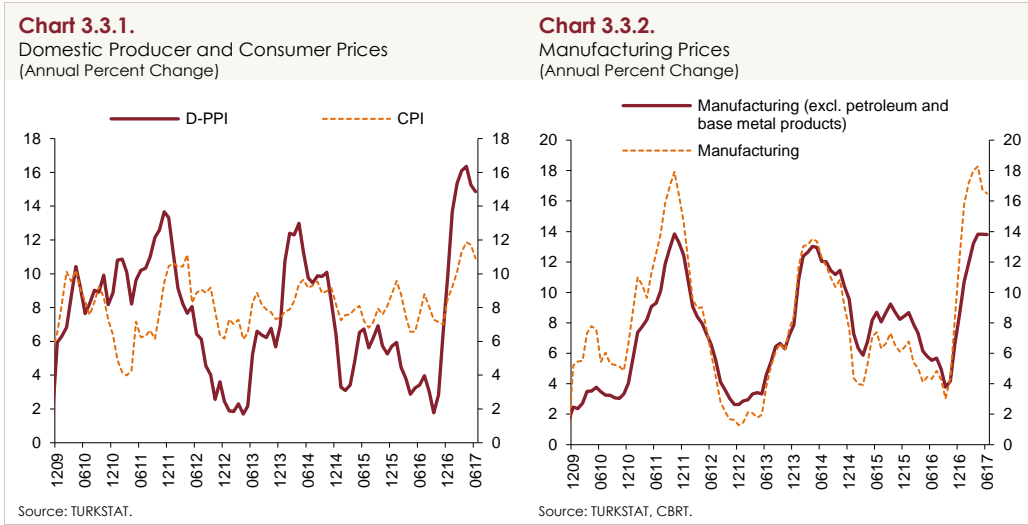
**Table 3.3.1.**  
D-PPI and Subcategories  
(Quarterly and Annual Percent Change)

|  | 2016  |       |       |        | 2017 |       |        |
|--|-------|-------|-------|--------|------|-------|--------|
|  | II    | III   | IV    | Annual | I    | II    | Annual |
| D-PPI  | 2.43  | 0.58  | 5.92  | 9.94   | 6.38 | 1.35  | 14.87  |
| Mining   | 6.49  | -0.17 | 3.01  | 8.01   | 9.53 | -2.60 | 9.70   |
| Manufacturing Industry   | 2.75  | 0.84  | 6.73  | 12.07  | 6.70 | 1.43  | 16.49  |
| Manufacturing Industry (excl. petroleum products)                | 2.14  | 0.87  | 5.92  | 10.83  | 6.68 | 1.76  | 15.99  |
| Manufacturing Industry (excl. petroleum and base metal products) | 1.49  | 1.16  | 3.92  | 8.46   | 6.10 | 2.03  | 13.81  |
| Electricity and Gas  | -2.96 | -2.20 | -2.17 | -11.79 | 0.64 | 2.27  | -1.53  |
| Water  | 1.52  | 0.27  | 1.98  | 7.21   | 6.40 | 1.71  | 10.66  |
| D-PPI by Main Industry Groups                                    |       |       |       |        |      |       |        |
| Intermediate Goods   | 2.59  | 0.43  | 9.17  | 13.83  | 8.21 | 0.90  | 19.72  |
| Durable Goods  | 2.56  | 2.15  | 1.82  | 11.75  | 6.49 | 3.47  | 14.61  |
| Durable Goods (excl. jewelry)                                    | 0.97  | 0.59  | 2.14  | 7.17   | 6.17 | 3.91  | 13.35  |
| Non-Durable Goods  | 1.81  | 0.88  | 2.04  | 6.41   | 4.58 | 2.86  | 10.73  |
| Capital Goods  | 1.03  | 1.61  | 4.82  | 9.32   | 5.96 | 1.27  | 14.28  |
| Energy   | 4.46  | -1.31 | 6.57  | 4.53   | 4.00 | -1.36 | 7.89   |

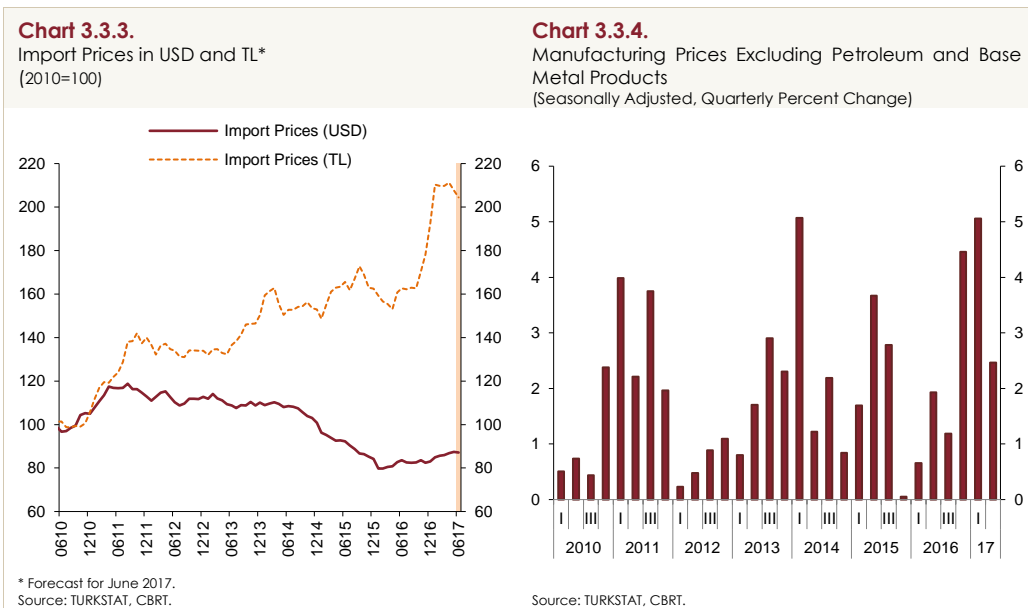
Source: TURKSTAT, CBRT.

In this period, manufacturing industry prices accelerated by 1.43 percent quarter-on-quarter, while annual inflation receded to 16.49 percent in this category (Table 3.3.1, Chart 3.3.2). The rise in the manufacturing industry prices is mainly attributed to the food, particularly the white meat, while prices of textiles and paper products as well as furniture appeared to be also influential. On the other hand, the favorable course of international prices for oil, metal and energy as well as the appreciation of the Turkish lira curbed inflationary pressures across the manufacturing industry in the second quarter. In fact, TL-denominated import prices posted a decline in this period (Chart 3.3.3).



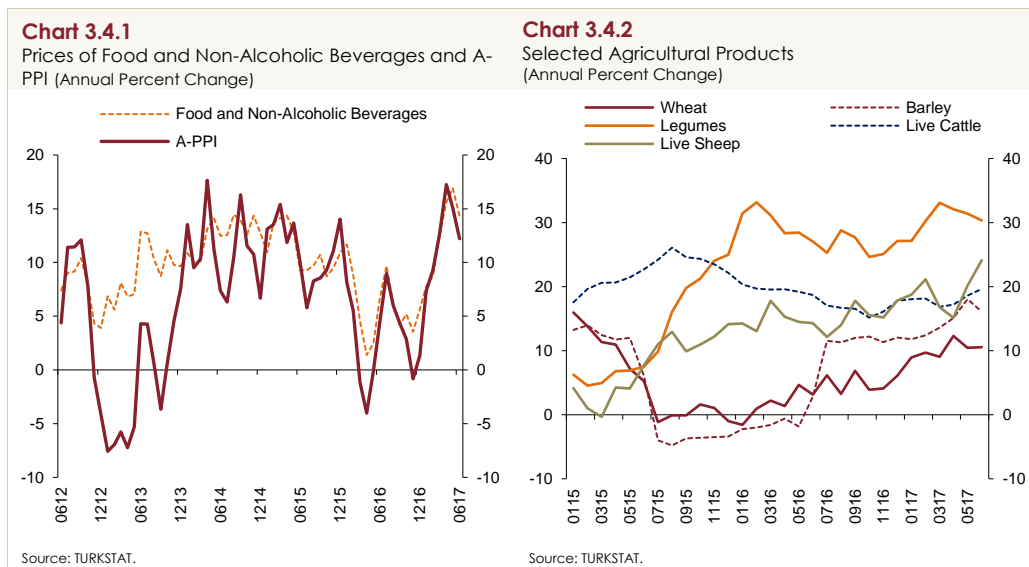


Main industrial categories witnessed price hikes in durable and non-durable goods, and a relatively moderate course in prices of intermediate and capital goods in the second quarter (Table 3.3.1). Prices of durable goods were pushed up by prices of furniture and home appliances, which are subject to temporary tax incentives, while prices of non-durable goods increased due to meat, food, beverages, textiles and footwear products. Prices of intermediate goods were mostly driven by rising prices of paper products, weavings, cement-plaster and plastic products. Prices of capital goods were pushed up by prices of motor vehicles and machinery. On the other hand, energy prices receded due to the decline in the prices of refined petroleum products and crude oil. All in all, the underlying inflation in manufacturing prices excluding petroleum and base metal products, which entails information on the underlying trend of producer prices, registered a quarterly deceleration, yet producer prices driven cost pressures on consumer prices remained robust owing to cumulative effects (Chart 3.3.4).



### 3.4. Agricultural Producer Prices

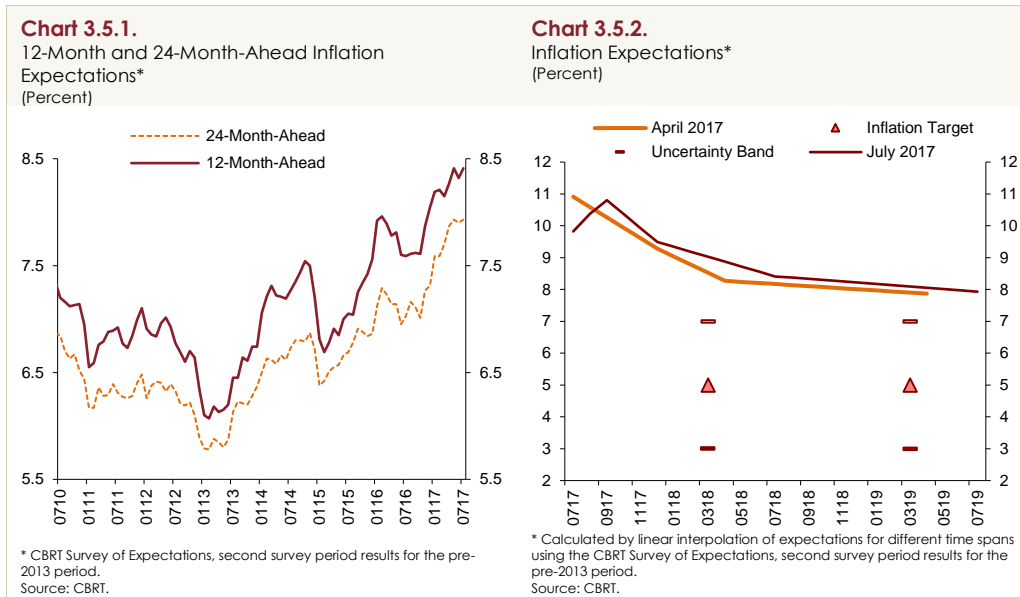
The agricultural producer prices soared by 4.36 percent in the second quarter pulling the annual A-PPI inflation down by 0.48 points to 12.23 percent (Chart 3.4.1). The partial deceleration in A-PPI inflation was driven particularly by vegetables. Having followed an upward track for a while, annual inflation in legumes posted a slight decline (Chart 3.4.2). On the other hand, prices of crops such as wheat, barley and maize remained on the rise in this quarter. Similarly, livestock prices continued with a brisker outlook, registering a jump by 20 percent over the last year (Chart 3.4.2). This was also reflected on the prices of red meat, which is a final consumer product. Moreover, the fresh tea purchasing price surged by a notable 13 percent in this quarter.



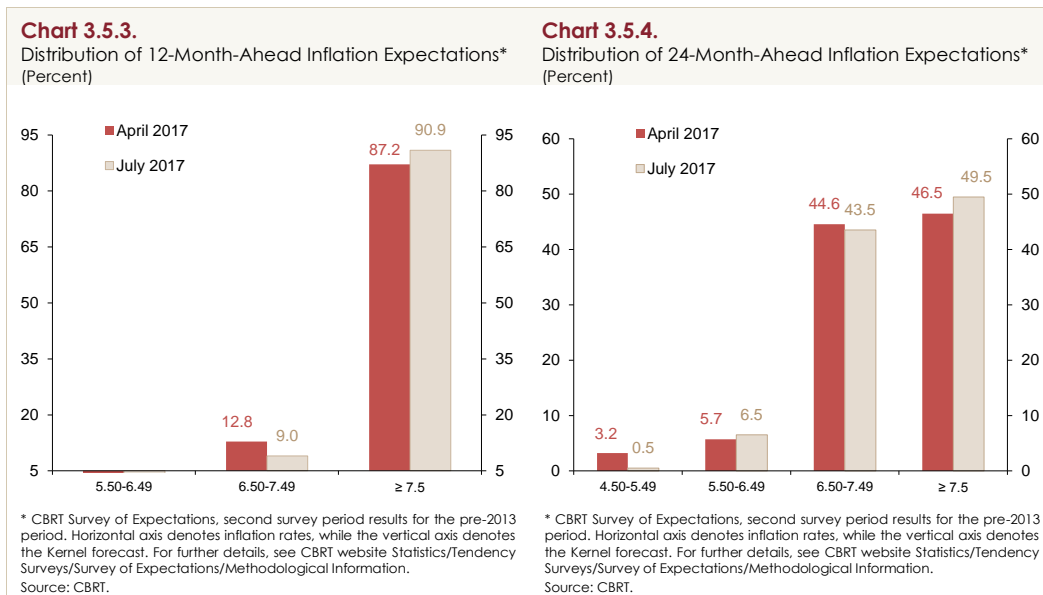
The underlying trend of A-PPI based on seasonally adjusted data in 3-month averages reveals some quarter-on-quarter decline, yet pressures driven by producer prices proved relatively robust particularly in April and May. Thus, fueled also by the hikes in producer prices, food consumer inflation remained high (Chart 3.4.1).

### 3.5. Expectations

The uptrend in inflation has led to a fast deterioration in expectations since November 2016. The plunge in the exchange rate impacted inflation not only through the cost channel, but also through expectations and the pricing behavior in this period. The ongoing deterioration in medium-term inflation expectations was replaced by a relatively flat course in the second quarter (Chart 3.5.1). Meanwhile, 12-month and 24-month-ahead expectations hovered substantially above the inflation target in July with 8.41 and 7.93 percent, respectively (Charts 3.5.1 and 3.5.2). Climbing to 7.9 percent in the last four months, 24-month-ahead expectations drew particular attention with the highest-ever surveyed level.



Inflation expectations across maturities reveal that short-term expectations were revised slightly upwards on a quarterly basis, and the rise in medium-term expectations remained rather limited (Chart 3.5.2). In fact, dispersion of inflation expectations deteriorated slightly compared to April (Charts 3.5.3 and 3.5.4). Medium-term inflation expectations have not displayed any improvement yet, pointing out that upside risks related to the pricing behavior on the inflation outlook persist.



Box  
3.1

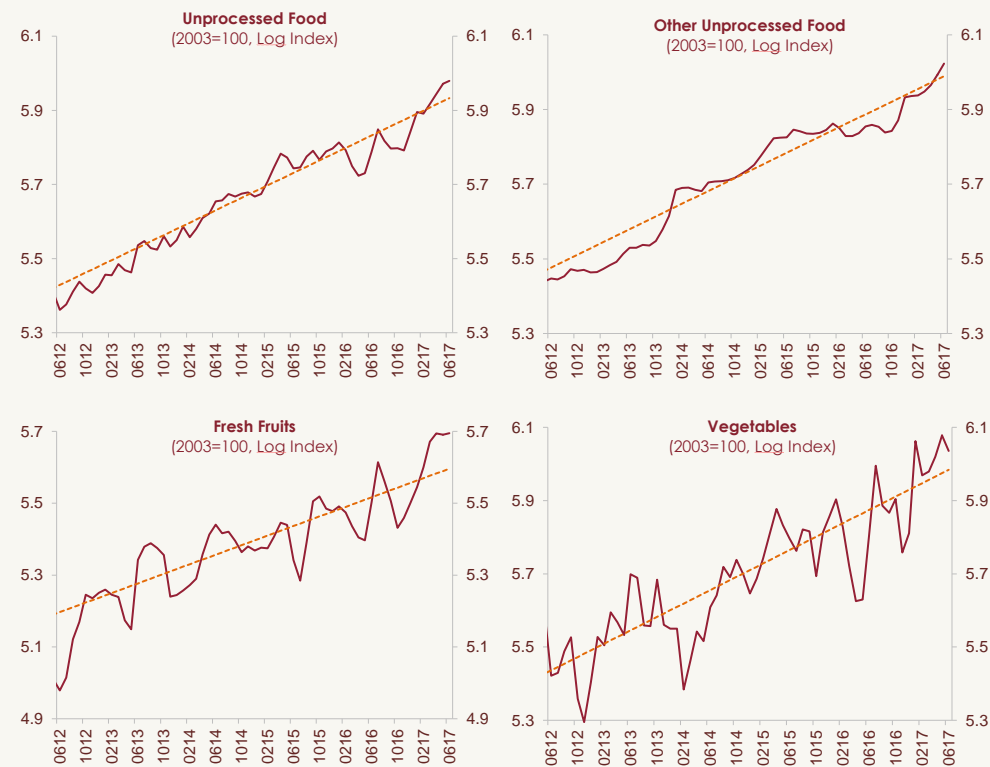
Recent Developments in Food Prices

Food prices displayed recent sharp increases, which were evident not only through fresh fruits and vegetables, but also across the whole food category. Among subcategories, diverse factors like supply shocks, exchange rate developments, export opportunities and relative price adjustments had influence on these price increases, indicating that measures to curb food inflation should be designed from a wider perspective.

Unprocessed food prices have both higher volatility and a faster pace of increase than overall consumer prices. The annual rate of increase in unprocessed food prices implied by its long-term trend is 10.6 percent (Chart 1). This rate varies across subcategories of unprocessed food prices. In particular, the annual rate of increase in fresh fruits, vegetables, and other unprocessed food prices is 8.3, 11.5 and 10.7 percent, respectively.

Unprocessed food prices recently displayed a sharp increase in general, which caused prices in all subcategories to exceed their long-term trends. The price spike was most evident in fresh fruits, while vegetable prices saw a partial correction. Meanwhile, other unprocessed food prices that are relatively more stable and rarely subject to abrupt increases exhibited a deteriorated outlook as well. Accordingly, prices in this subcategory, which have remained below the long-term trend since February 2016, surpassed the trend as of June 2017.

Chart 1. Unprocessed Food Prices and Long-Term Trends by Subcategories\*



\* Solid lines show the seasonally adjusted indices in logarithms while dashed lines display the respective linear long-term trend. Source: TURKSTAT, CBRT.

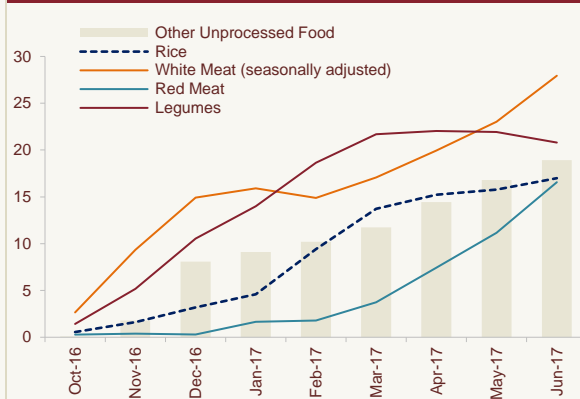
As for fresh fruits and vegetables, the adverse impacts of supply shocks vanish quickly through opposite price movements. This is because vegetables have a short harvesting time and the field production is supported by greenhouse production, which can rapidly offset the negative effects of supply shocks. However, given the longer time needed for production, the impact of negative supply shocks (frost etc.) on fresh fruits is more permanent (Öğünç and Sankaya, 2016). This causes prices to correct in a relatively longer period of time, which stands out as a crucial risk factor to food inflation in the short term.

The base effect and the fact that prices of fresh fruits and vegetables hovered above their long-term trend caused annual inflation in this subcategory to remain elevated. Meanwhile, price hikes in other unprocessed food prices since October 2016 are also critical regarding the dispersion of inflation (Chart 2). The uptrend recorded particularly in red meat and seasonally adjusted white meat prices since February 2017 continued in June. Red meat prices soared due to the domestic supply shortage, while white prices remained on an upward track amid the brisk course of exports. However, it should also be noted that customs duty arrangements which will directly or indirectly affect prices of these products can limit price increases in the upcoming period as well.

Regarding rice and legumes, the adoption of measures has impeded the recent price increases, yet cumulative price hikes remain quite high (Chart 2). All in all, cumulative inflation in other unprocessed food prices has hovered around 20 percent since October 2016, indicating that the high course of unprocessed food inflation is not limited to fresh fruits and vegetables.

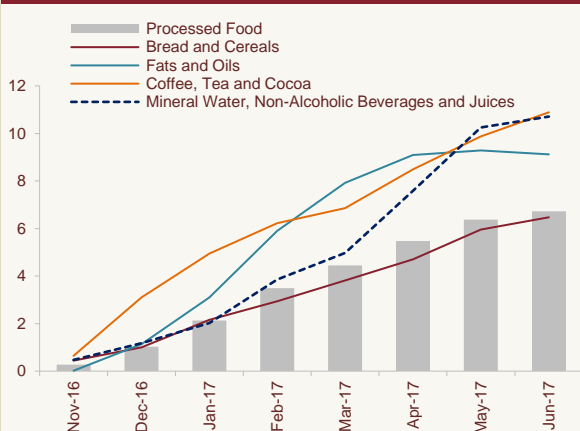
Processed food inflation remains relatively low, but displays a similar outlook recently. Cumulative price hikes in this subcategory have been remarkable since November 2016. The impact of the exchange rate is particularly evident. In items containing imported products like fats and oils as well as coffee, tea and cocoa, the depreciating Turkish lira pushed cumulative price increases upwards, and prices in bread and cereals remained on the rise amid the price hike in wheat (Chart 3).

**Chart 2. Other Unprocessed Food Prices**  
(Cumulative Percentage Change, October 2016-June 2017)



Source: TURKSTAT, CBRT.

**Chart 3. Processed Food Prices**  
(Cumulative Percentage Change, November 2016-June 2017)



Source: TURKSTAT, CBRT.

In sum, food prices have recently displayed sharp increases, which were evident across the whole food category. These increases were caused by various factors such as exchange rate developments, supply shocks, export opportunities, relative price adjustments etc. Taking into account the fact that inflation can be influenced by different factors in each subcategory, it is assessed that reducing inflation requires a diverse set of measures.

#### **References**

Öğünç, F. and Ç. Sarkaya, 2016, İşlenmemiş Gıda Enflasyonu Kısa Vadeli Tahminine Alternatif Bakış (in Turkish), CBT Research Notes in Economics No. 16/13.