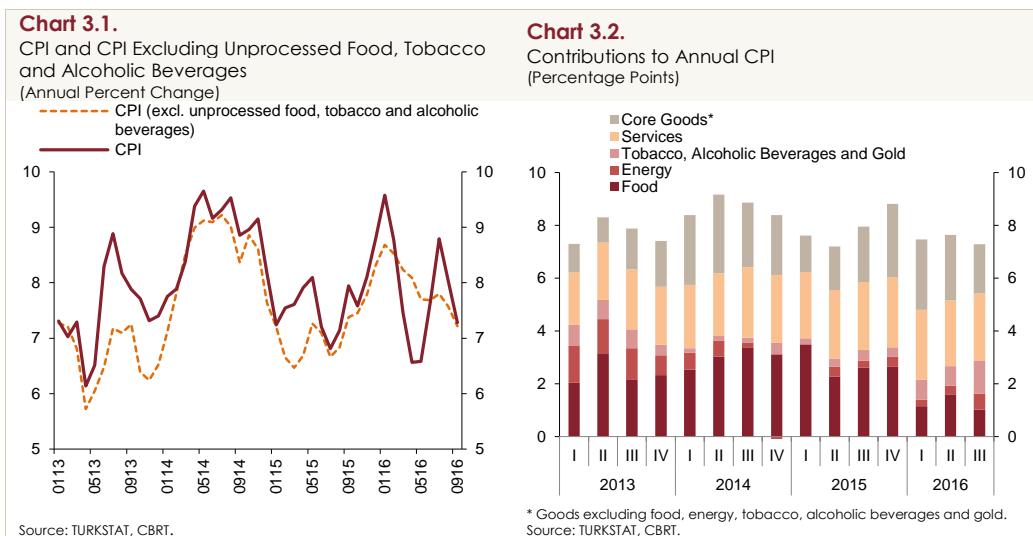


3. Inflation Developments

In the third quarter of 2016, consumer inflation inched down by 0.36 points quarter-on-quarter to 7.28 percent (Chart 3.1). This drop is attributed to core goods and food inflation, while annual inflation in tobacco and energy increased. Core goods inflation was substantially lower due to waning cumulative effects of exchange rate and weaker demand conditions. In addition, modest import prices also contributed to a more benign inflation outlook. The slowing food inflation was mainly due to the tourism slump and the reduced exports to Russia. Food inflation excluding fresh fruits and vegetables plunged to a five-year low of 4.78 percent in September. On the other hand, despite the sluggish economic activity and slowing food inflation, services inflation remained high amid rising real unit labor costs and rents. After January's tax-driven price hike in tobacco products, cigarette companies raised their prices again in July. Thus, tobacco products added 1.1 points to consumer inflation over the past one year, surpassing historical averages. Meanwhile, despite moderate oil prices, energy prices were up due to the SCT adjustment to fuel products in September. Despite the volatile third-quarter consumer inflation, annual inflation in core indicators continued to slow for the second consecutive quarter. Core indicators, diffusion indices and producer prices all hinted at an improved consumer inflation outlook in this period.



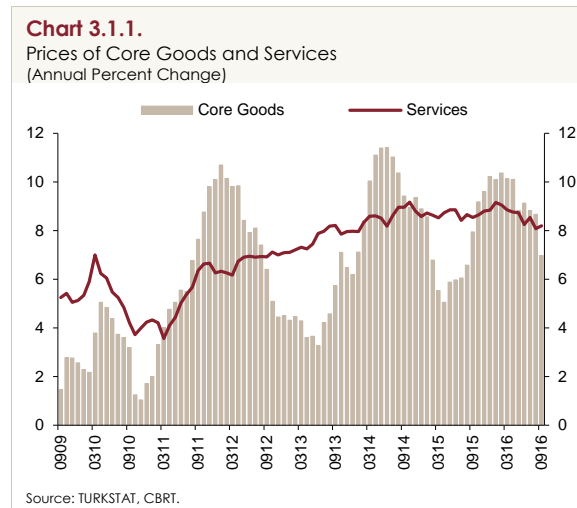
In the third quarter, the contribution of tobacco, alcoholic beverages and energy to annual inflation rose by 0.5 and 0.3 points, respectively, while the contribution of core goods and food was down 0.6 points each (Chart 3.2). The contribution of services, on the other hand, remained unchanged. Therefore, the contribution of core indicators to consumer inflation improved on the back of core goods.

In short, rising fuel taxes and changing prices of tobacco products restricted the improvement in consumer inflation during the third quarter but waning cumulative effects of the exchange rate and slowing domestic demand helped bring core inflation down gradually. The tourism slump kept a lid on prices of food and services such as accommodation and catering. Meanwhile, the contribution of wages to consumer inflation posted a year-on-year increase, which had particular implications for the

services industry and labor-intensive sectors such as furniture.¹ Volatile exchange rates cause risks to the core inflation outlook to remain on the upside for the upcoming period. In addition, the indirect effects of rising oil and fuel prices on the overall economy, particularly transport, pose another upside risk. Nevertheless, the October drop in natural gas prices is expected to have a -0.16 points direct contribution to annual inflation. Lastly, domestic demand may also pose downside risks to inflation given a possible economic slowdown.

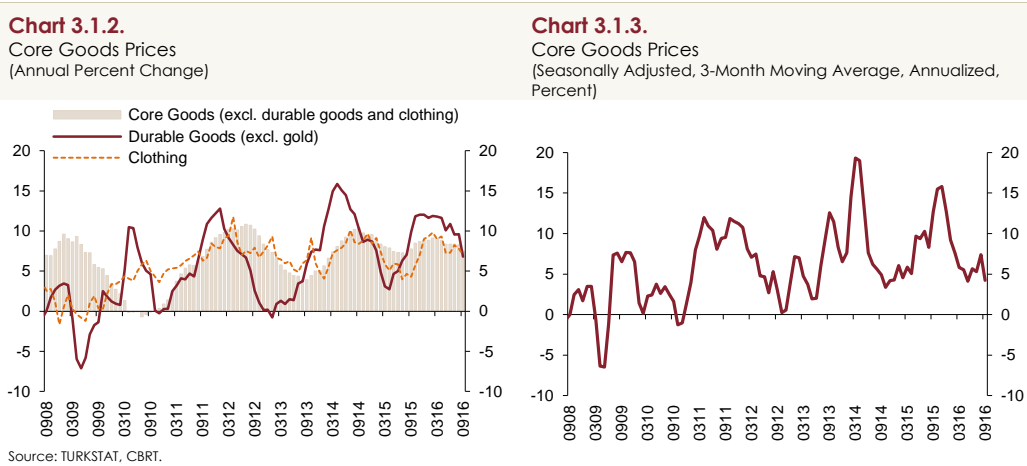
3.1. Core Inflation Outlook

Annual core goods inflation fell by 2.2 points to 6.97 percent in the third quarter (Table 3.1.1, Chart 3.1.1). The fall was evident across all subcategories, albeit less markedly in clothing (Chart 3.1.2). This outlook for core goods was mostly driven by moderate exchange rates and the slowdown in demand.



Annual durable goods inflation fell by 4.06 points amid base effects and waning cumulative exchange rate effects in the third quarter. This fall was the main driver of the improvement in core goods inflation (Chart 3.1.2). Prices in this category were up in August due to increases in automobile prices, yet remained moderate throughout the quarter. In line with the developments in producer prices, furniture prices saw a cumulative increase up to 8 percent by September and followed a modest track in the past two months after the July upsurge. Clothing prices decreased at a faster rate than seasonal averages due to slowing aggregate demand, driving annual clothing inflation down to 6.99 percent. Falling by 0.86 points, annual core goods inflation excluding clothing and durables also reflected waning exchange rate effects.

¹ For a detailed analysis on the main determinants of inflation, see Box 3.1.



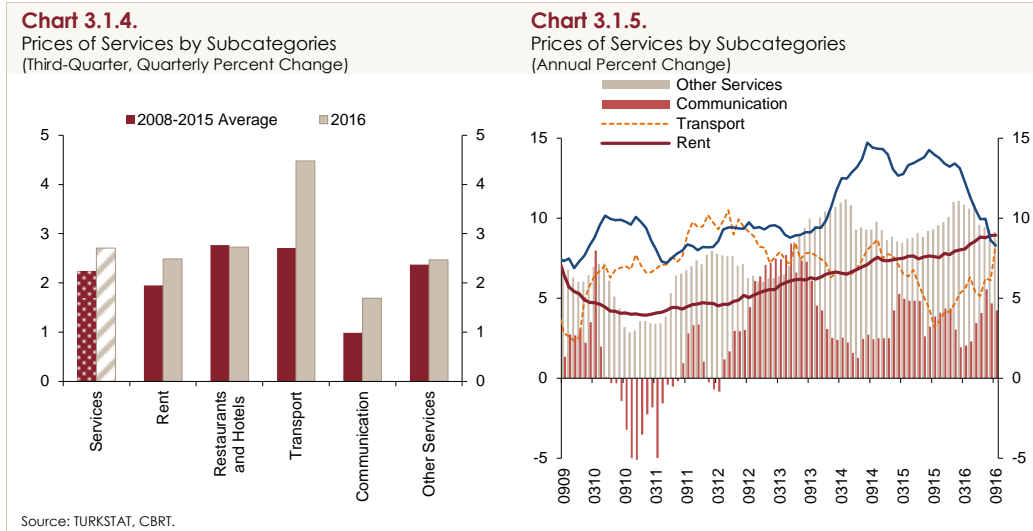
Against this backdrop, the contribution of core goods to annual consumer inflation edged down by 0.61 points to 1.87 points in the third quarter, while the underlying trend of core goods inflation decelerated compared to the previous quarter (Chart 3.1.3). All in all, the third quarter of the year was marked by a downturn in both the annual inflation and the underlying trend of core goods prices.

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

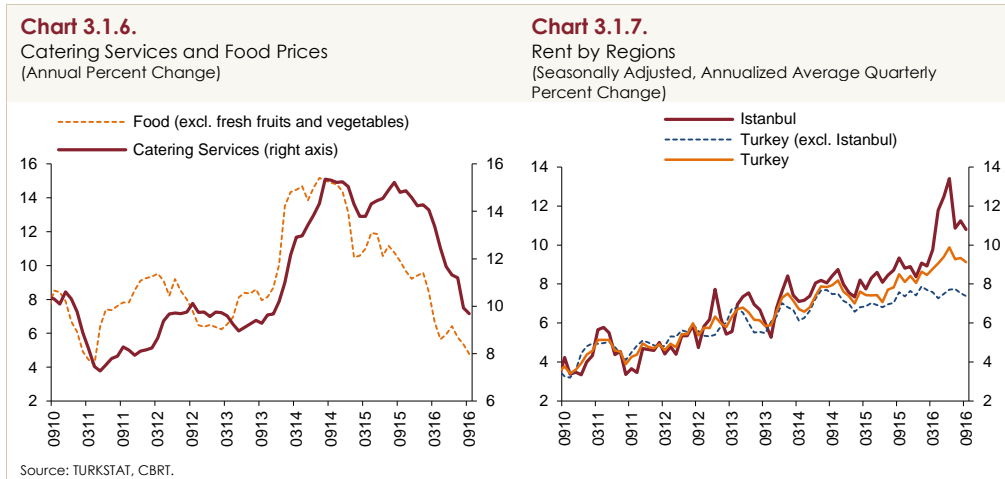
	2015			2016			
	III	IV	Annual	I	II	III	Annual
CPI	1.39	2.44	8.81	1.75	1.84	1.05	7.28
1. Goods	0.81	3.02	8.79	1.51	1.85	0.32	6.85
Energy	-0.70	0.24	2.96	0.85	1.94	1.46	4.56
Food and Non-Alcoholic Beverages	2.85	3.03	10.87	2.65	-1.97	0.46	4.16
Unprocessed Food	3.56	4.07	13.83	2.49	-5.29	-0.48	0.54
Processed Food	2.22	2.11	8.33	2.80	1.01	1.25	7.35
Core Goods	-0.57	5.15	10.22	-1.18	5.63	-2.54	6.97
Clothing and Footwear	-11.81	15.34	9.00	-12.42	20.44	-12.06	6.99
Durable Goods (excl. gold)	4.57	1.66	12.05	3.70	0.57	0.74	6.80
Furniture	3.20	2.32	10.70	5.72	1.03	0.98	10.36
Electrical and Non-Electrical Appliances	4.00	1.96	9.69	1.38	-1.04	-0.46	1.83
Automobile	5.71	1.07	14.01	4.95	1.28	1.45	8.98
Other Durable Goods	2.61	2.94	12.28	0.87	2.40	1.11	7.51
Core Goods (excl. clothing and durable goods)	2.25	2.32	8.79	2.06	1.48	1.44	7.51
Tobacco, Alcoholic Beverages and Gold	2.32	-0.94	6.56	11.14	0.35	10.20	21.75
2. Services	2.76	1.10	8.85	2.33	1.83	2.71	8.19
Rent	2.38	1.90	7.73	1.80	2.48	2.49	8.95
Restaurants and Hotels	4.29	1.34	13.23	2.53	1.46	2.73	8.31
Transport	1.41	0.56	4.17	1.47	1.61	4.48	8.32
Communication	1.53	0.63	4.36	0.00	1.87	1.69	4.24
Other Services	2.87	0.92	10.09	3.65	1.84	2.47	9.16

Source: TURKSTAT, CBRT.

In the third quarter, prices of services increased above past averages by 2.71 percent, and annual services inflation remained elevated at 8.19 percent (Charts 3.1.1 and 3.1.4). Price increases in restaurants and hotels were close to historical averages in this period, but annual inflation eased further in this category (Chart 3.1.5). On the other hand, prices in rent, transport and communication not only increased at a rate above historical averages in the third quarter but also saw higher annual inflation (Charts 3.1.4 and 3.1.5).



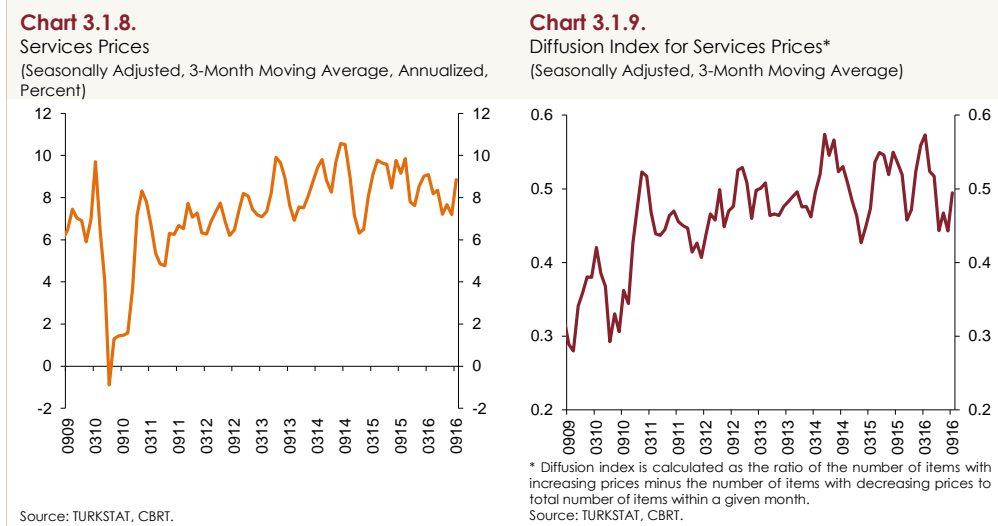
The decreasing food inflation and the tourism slump drove inflation down in restaurants and hotels. Annual inflation in catering services declined further amid developments in food prices (Chart 3.1.6). The drastic fall in the number of tourists caused the annual inflation in accommodation services to hit an all-time low of -2.68 percent. Meanwhile, annual inflation in other services dropped by 0.43 points quarter-on-quarter due to subsiding cumulative exchange rate effects, yet remained elevated due to high inflation expectations (Table 3.1.1). Price hikes in fuel products posed a cost pressure on transport prices in this period, pushing annual transport inflation up to a two-year high of 8.32 percent. Moreover, the upsurge in labor costs driven by the minimum wage increase weighed on the inflation in services, a labor-intensive sector.



Another key driver of services inflation was rent, which has been on the rise since early 2011 (Chart 3.1.5). The underlying rent inflation in seasonally adjusted terms diverged across regions, with Istanbul recording the largest increase in 2016 (Chart 3.1.7). In other provinces, however, underlying rent inflation remained on an almost horizontal path through the past one year. In the third quarter, the underlying trend of rent inflation edged down in Istanbul yet remained elevated.

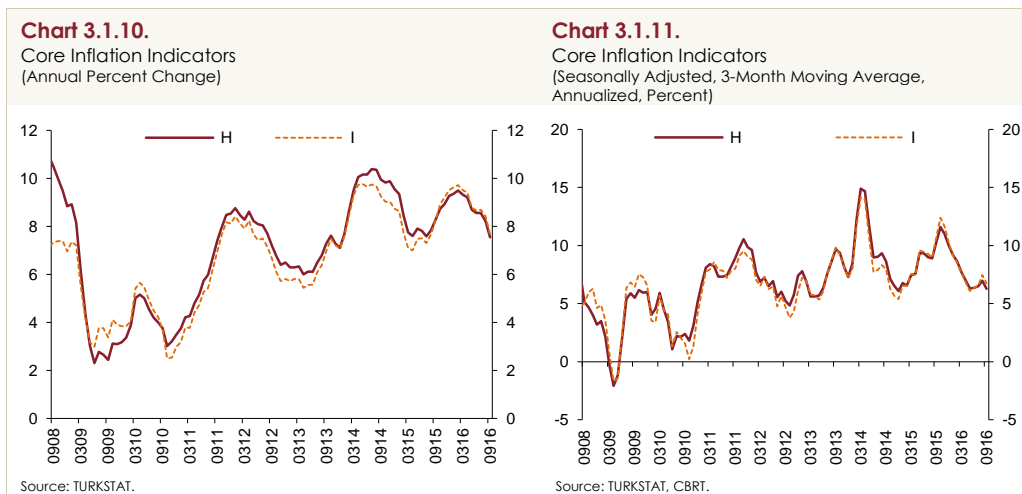
Accordingly, indicators for the underlying trend of services inflation saw a deterioration in the third quarter. In particular, both the underlying trend of inflation, which is captured by seasonally

adjusted 3-month moving averages, and the price increasing tendency, which is implied by the diffusion index, recorded an increase (Charts 3.1.8 and 3.1.9).



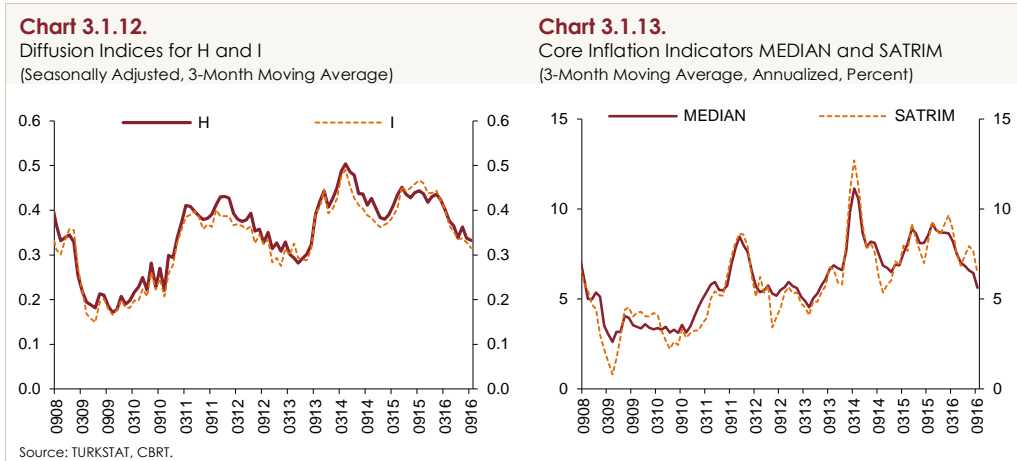
In sum, the improvement in cost factors driven by food prices and the exchange rate as well as the falling tourism demand caused services inflation to decelerate in this period, especially through accommodation and catering services. On the other hand, rising fuel prices, accelerating rents and wage developments put a lid on a more favorable outlook in services inflation. Additionally, services inflation still remains high amid the headline inflation rate and the current course of inflation expectations.

Annual inflation in core indicators remained on a downtrend in this period. Annual inflation in H and I core inflation indicators was down 1 point quarter-on-quarter to 7.56 and 7.69 percent, respectively, on the back of lower core goods inflation (Chart 3.1.10). Meanwhile, the underlying trend of core inflation indicators was flat quarter-on-quarter amid the minor fall in September (Chart 3.1.11).



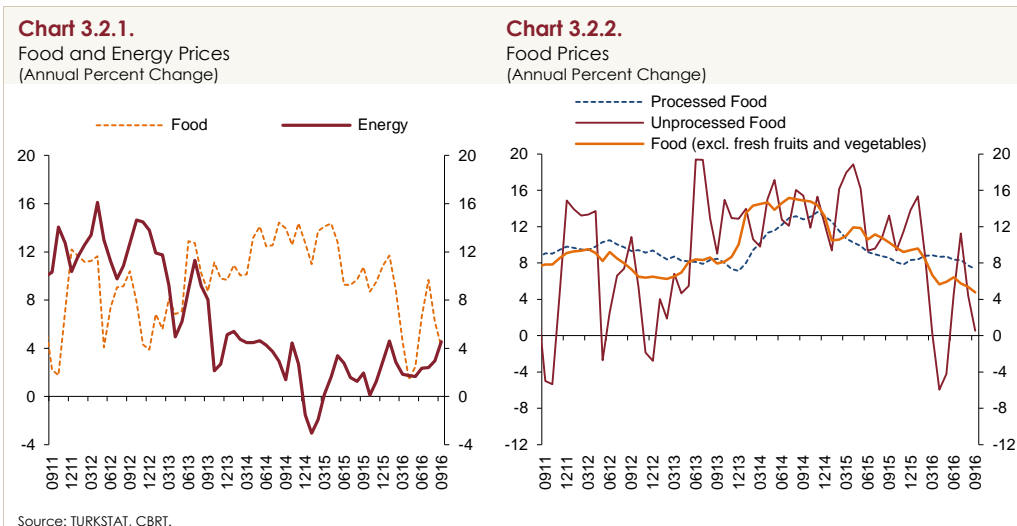
On the other hand, the likelihood for prices to rise was down from the second quarter as captured by the diffusion indices for core indicators (Chart 3.1.12). SATRIM and MEDIAN, the alternative

core inflation indices monitored by the CBRT, posted a more remarkable decline than in the previous quarter (Chart 3.1.13). In sum, indicators for tendency and pricing behavior all pointed to an ongoing deceleration in the underlying trend of inflation for the third quarter.



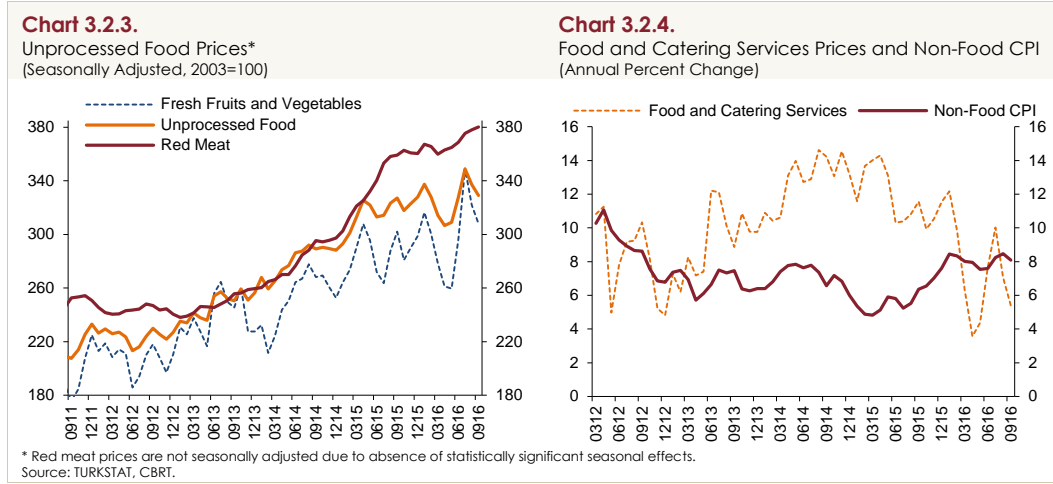
3.2. Food, Energy, Tobacco and Alcoholic Beverages

After rising slightly in the second quarter, annual food inflation decreased by 2.47 points to 4.16 percent in the third quarter (Chart 3.2.1). Thus, annual food inflation remained well below the July Inflation Report forecast. This slowdown was partly attributed to the plunging tourism demand, the reduced exports to Russia and the adoption of measures for red meat.



Unprocessed food inflation followed a highly volatile path in this period due to prices of fresh fruits and vegetables (Chart 3.2.2). Annual unprocessed food inflation dropped to as low as 0.54 percent at the end of the third quarter, while seasonally adjusted prices recorded a marked fall in August and September after the July climb (Chart 3.2.3). Moreover, annual inflation in food prices excluding fresh fruits and vegetables retreated to a five-year low of 4.78 percent (Chart 3.2.2). Red meat prices were on a relatively modest uptrend after April (Chart 3.2.3). However, thanks to new

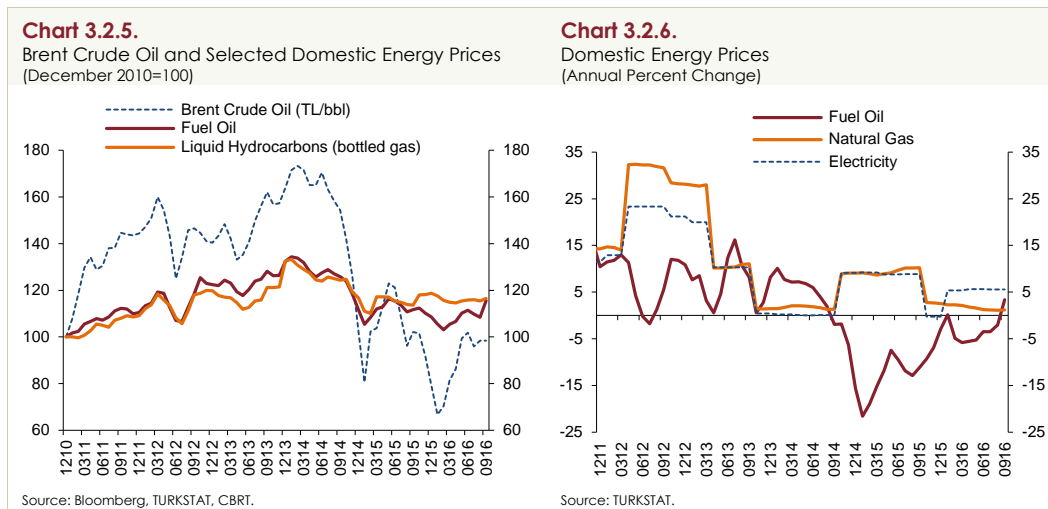
measures, annual inflation in red meat prices continued to fall in the third quarter. These measures are expected to support the moderate course of red meat prices in the upcoming period.



On the processed food front, annual inflation slid by 1.03 points to 7.35 percent in the third quarter (Chart 3.2.2). Annual inflation in oils, fats and tea went down mainly owing to a high base effect in this period. Despite slight price hikes, annual inflation in bread and cereals remained elevated. In addition, with their annual inflation on the decline amid a lower inflation in red meat prices, processed meat prices continued to contribute favorably to the inflation outlook.

Annual inflation in food and catering services prices decreased by 2.26 points to 5.39 percent, while non-food CPI inflation rose by 0.50 points to 8.09 percent in the third quarter (Chart 3.2.4). The drop in food and catering services inflation was largely driven by the tourism slump (Box 3.2). Pulling inflation down to target-consistent levels in food-related categories is critical. In this respect, actions taken by the Food Committee set an invaluable precedent.

Energy prices surged by 1.46 percent in the third quarter (Table 3.1.1). Having soared since February and increased at a stronger pace through the second quarter, international oil prices dropped in July, with Brent crude oil prices falling down to around 45 USD per barrel before remaining flat in the following months. This drop had positive implications for energy prices, which was evident in falling fuel prices during July and August. However, fuel prices were up 3.63 percent in the third quarter due to the September increase of 0.20 TL in the lump-sum SCT on fuel products (Charts 3.2.5 and 3.2.6). Therefore, annual energy inflation rose by 2.23 points from the end of the second quarter to 4.56 percent in September, mainly due to the tax hike. The tax hike will continue to weigh on fuel prices in October, albeit to a lesser degree, and will have a total direct effect of around 0.3 points on consumer inflation. On the other hand, the reductions in natural gas prices, effective October 1, are expected to have a direct impact of about -0.16 points on consumer inflation.



Prices of tobacco and alcoholic beverages jumped by 10.73 percent in the third quarter amid price increases imposed by cigarette producers in July. Accordingly, including the January tax hike, prices of tobacco products posted a cumulative upsurge of 23.1 percent in the first three quarters. The contribution of tobacco and alcoholic beverages to annual inflation increased to 1.1 points, which is well above historical averages.

3.3. Domestic Producer Prices

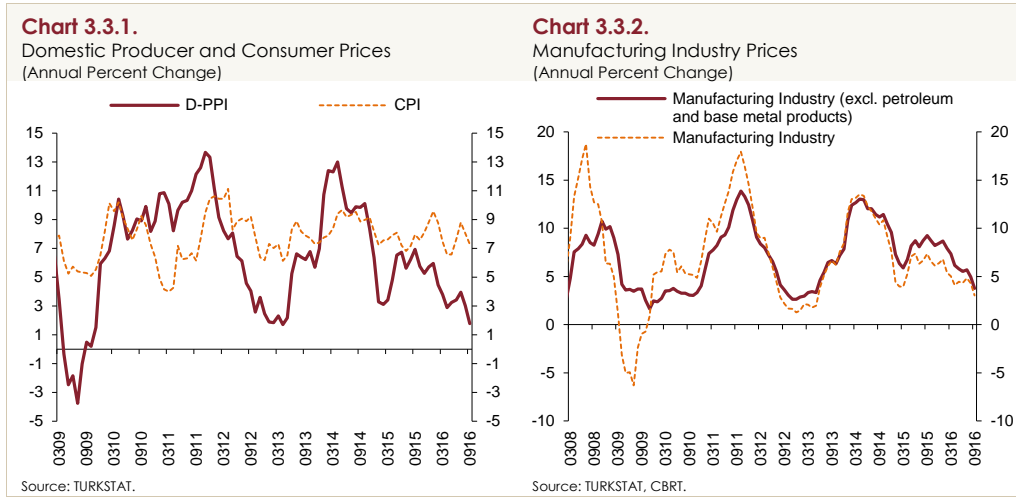
Domestic producer prices rose by a modest 0.58 percent in the third quarter amid manufacturing price developments. Meanwhile, annual inflation in domestic producer prices declined by 1.63 points quarter-on-quarter to 1.78 percent, hinting at weak producer price pressures (Table 3.3.1, Chart 3.3.1). Yet, subcategories of domestic producer prices diverged in this period. In fact, energy prices were below the previous year's readings, whereas durable goods were subject to stronger producer price pressures during the past one year (Table 3.3.1).

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

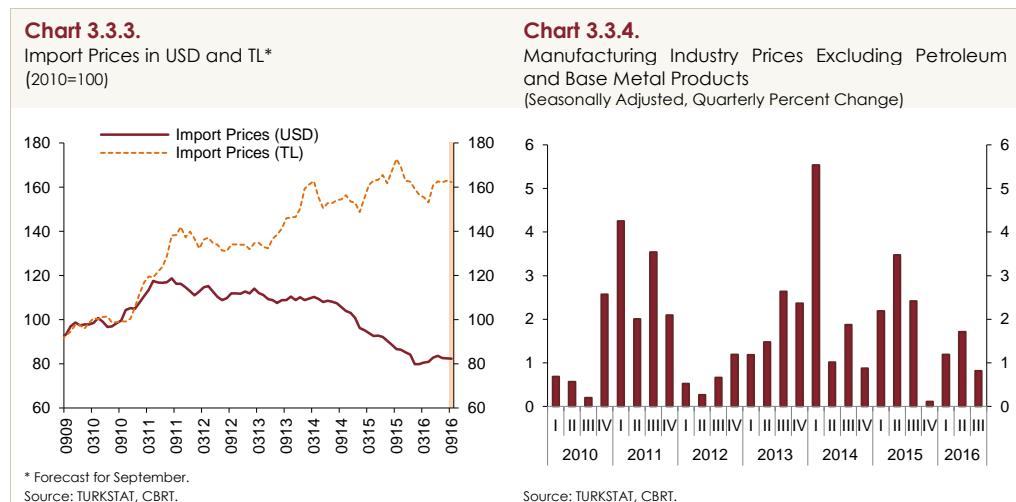
	2015			2016			
	III	IV	Annual	I	II	III	Annual
D-PPI	2.20	-1.94	5.71	0.75	2.43	0.58	1.78
Mining	-3.41	-1.08	-0.69	-1.36	6.49	-0.17	3.72
Manufacturing Industry	2.12	-1.89	6.38	1.33	2.75	0.84	3.02
Manufacturing Industry (excl. petroleum products)	2.70	-1.32	7.28	1.56	2.14	0.87	3.25
Manufacturing Industry (excl. petroleum and base metal products)	2.88	-0.57	8.44	1.66	1.49	1.16	3.77
Electricity and Gas	5.38	-3.39	0.19	-4.99	-2.96	-2.20	-12.89
Water	0.27	2.89	19.95	3.27	1.52	0.27	8.17
D-PPI by Main Industry Groups							
Intermediate Goods	3.05	-2.30	5.69	1.19	2.59	0.43	1.86
Durable Goods	4.07	-0.40	12.48	4.76	2.56	2.15	9.32
Durable Goods (excl. jewelry)	2.87	2.54	11.78	3.31	0.97	0.59	7.59
Non-Durable Goods	0.60	-0.52	6.73	1.55	1.81	0.88	3.75
Capital Goods	5.15	-0.45	10.08	1.59	1.03	1.61	3.82
Energy	-0.49	-5.54	-2.57	-4.86	4.46	-1.31	-7.35

Source: TURKSTAT, CBRT.

Manufacturing industry prices increased by 0.84 percent quarter-on-quarter while annual inflation fell to 3.02 percent (Table 3.3.1, Chart 3.3.2). Similarly, manufacturing industry inflation excluding petroleum and base metal products continued to edge down (Chart 3.3.2). In the third quarter, import prices were slightly down in USD terms, but remained flat in TL terms amid developments in exchange rates (Chart 3.3.3).

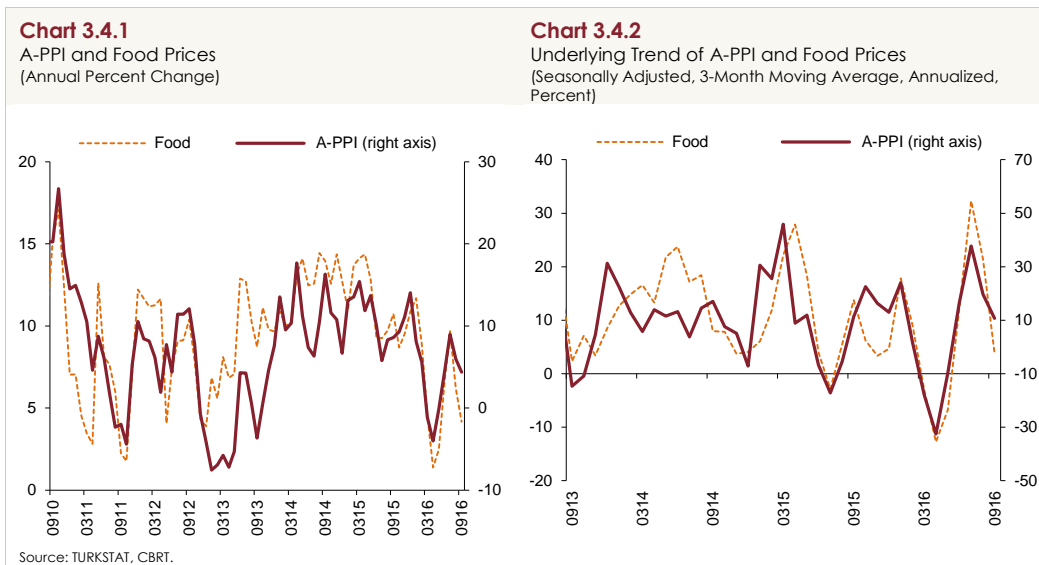


Among main industrial categories, prices were significantly higher on a quarter-on-quarter basis in durable goods and capital goods (Table 3.3.1). Prices of durable goods were mostly affected by developments in gold prices, yet prices of durable goods excluding jewelry were only up a mere 0.59 percent due to furniture prices. On the capital goods front, prices increased owing to prices of motor vehicle accessories and special purpose machines. Prices of non-durable and intermediate goods rose moderately in the third quarter. Energy prices went down by 1.31 percent on the back of falling prices of power generation and distribution. Accordingly, the underlying inflation in manufacturing industry prices excluding petroleum and base metal products, which entails information on the underlying trend of producer prices, recorded a quarterly slowdown, while cost pressures driven by producer prices remained subdued (Chart 3.3.4).



3.4. Producer Prices of Agricultural Products

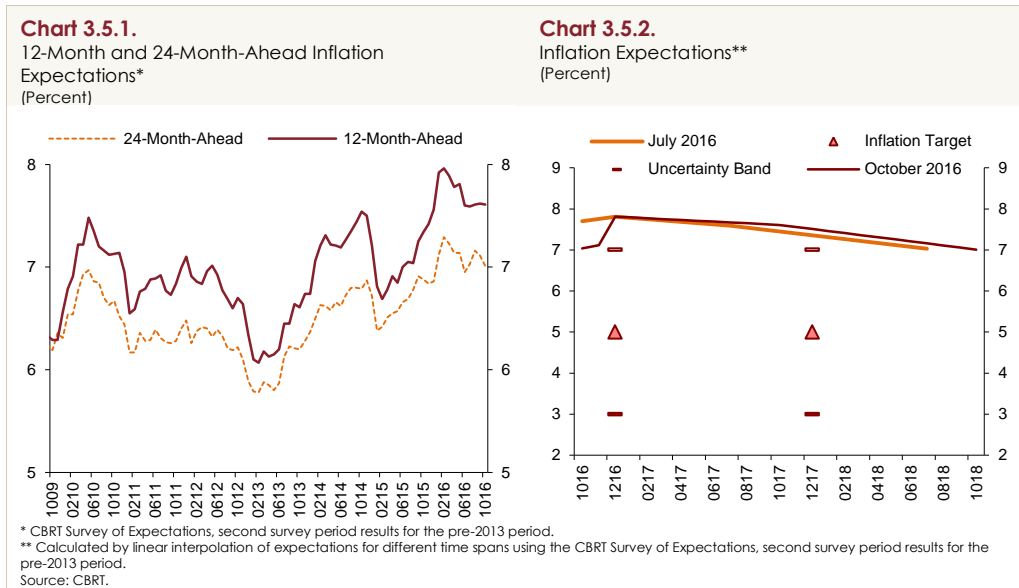
In the third quarter of the year, the A-PPI fell by 0.41 percent, while annual inflation in this category remained flat at 4.39 percent compared to the end of the second quarter (Chart 3.4.1). Annual inflation in fruits and vegetables was more moderate than in the previous quarter. On the other hand, live cattle prices remained on the rise, while cereal prices rose slightly owing to higher wheat and barley prices. Moreover, legumes, particularly chickpeas, saw significant price hikes. Additionally, producer prices for hazelnuts surged due to an output shortage.



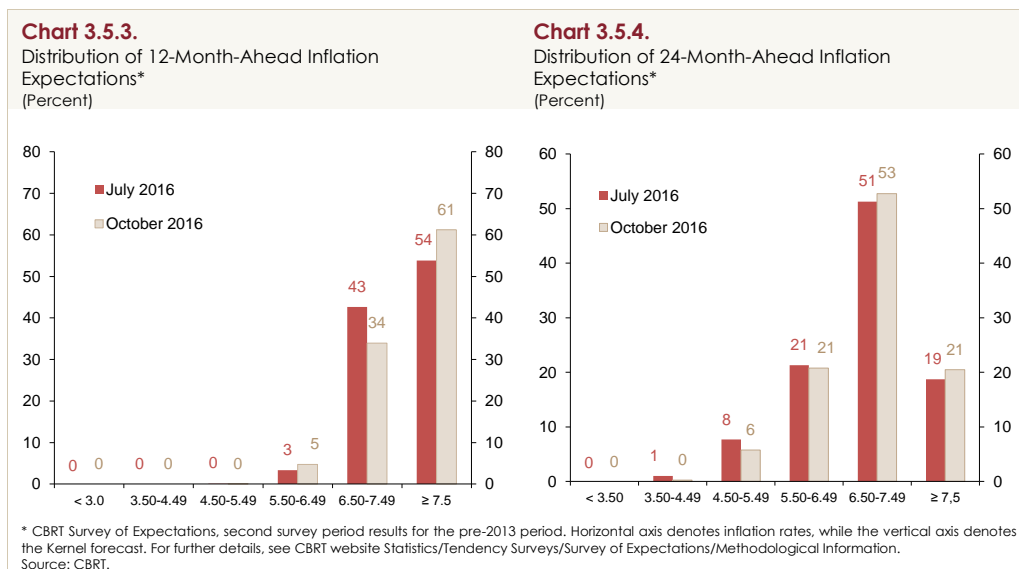
The underlying trend of A-PPI based on seasonally adjusted data in 3-month moving averages reveals a notable downturn, which was also evident in the third quarter's consumer inflation for food (Chart 3.4.2).

3.5. Expectations

Medium-term inflation expectations remained flat quarter-on-quarter in the third quarter. 12-month and 24-month ahead expectations remained above the inflation target by standing at 7.6 and 7.0 percent, respectively, as of October (Chart 3.5.1). Despite exhibiting a volatile pattern throughout the quarter, year-end expectations remained basically unchanged from the previous quarter at 7.8 percent. Across maturities, inflation expectations for 2017 and onward barely changed in the inter-reporting period (Chart 3.5.2).



The dispersion of medium-term inflation expectations points to some deterioration in inflation expectations in October compared to July (Charts 3.5.3 and 3.5.4). More specifically, the percentage of respondents expecting 12-month-ahead inflation to be between 6.5 and 7.49 percent decreased, whereas those expecting it to be 7.5 percent or above increased (Chart 3.5.3). However, this change in the dispersion had a small effect on average expectations.



Box
3.1Inflation Dynamics over the Past Decade: A Historical Accounting²

During the inflation targeting period from 2006 to 2015, annual consumer inflation in Turkey remained high with an average rate of 8.2 percent, significantly exceeding the targets. In terms of year-end inflation realizations, the lowest inflation rate was 6.2 percent in 2012 while the highest was recorded in 2011 with 10.5 percent. An inquiry into the question of which fundamental macroeconomic variables have been more influential on inflation developments over the last decade might provide insight into policy options for maintaining price stability in the upcoming period. Hence, by analyzing the effects of main macroeconomic variables during the inflation targeting period in Turkey, this box documents the changes in inflation dynamics via a quantitative historical accounting perspective.

The model used in decomposing the factors influencing inflation is based on a 2-equation model in the spirit of Yellen (2015). The first equation divides the CPI into four categories as unprocessed food, tobacco and alcoholic beverages, taxes and CPI excluding these categories (CPIX). The second equation is a reduced-form time-varying parameter Phillips curve estimated to explain the CPIX by using quarterly data. To explain the CPIX inflation in this equation, major explanatory variables are included such as lagged inflation, USD-denominated import prices, exchange rate (USD/TL), the output gap and real unit wages. Unprocessed food inflation excluding fresh fruits and vegetables is also used to capture the indirect effects of food prices on catering services.

Contributions to consumer inflation are calculated by multiplying the relevant variable by its corresponding time-varying coefficient and cumulated to obtain yearly figures. The part of inflation that cannot be explained by fundamental macroeconomic variables (import prices, exchange rate, output gap, unit labor costs, food prices and tax adjustments), which is therefore estimated as a constant term is called "rigidity".

Historical Accounting: A Decomposition Analysis on Consumer Inflation

Table 1 presents contributions to consumer inflation in average terms for the entire inflation targeting period and also by sub-periods for the former and the latter half, while Chart 1 displays these contributions individually for each year. During the inflation targeting period, unprocessed food prices provided one of the highest contributions (with its direct and indirect effects) to consumer inflation. Accordingly, the annual contribution of unprocessed food prices to inflation was 1.4 percentage points on average, reaching a total of 2.2 points when indirect effects, especially through catering services, are also taken into account (Table 1). Yet, the magnitude of the contribution fluctuated heavily from one year to another, which thus marks unprocessed food prices as one of the major drivers of uncertainty in inflation. For instance, the contribution went down from 3.5 points in 2009 to -0.1 point in 2012 (Chart 1).

² This box is based on Kara et al. (2016).

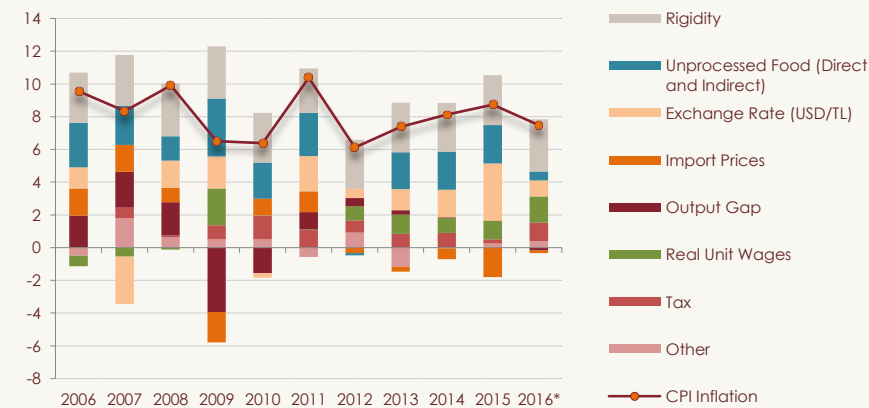
Table 1. Average Contributions to CPI Inflation
(Percentage Points)

	Rigidity	Unprocessed Food (Direct and Indirect)	Exchange Rate (USD/TL)	Import Prices	Output Gap	Real Unit Wages	Tax	Other*	CPI Inflation
2006-2015	3.0	2.2	1.1	0.2	0.3	0.5	0.7	0.2	8.2
2006-2010	3.1	2.5	0.4	0.7	0.1	0.2	0.6	0.6	8.2
2011-2015	3.0	1.9	1.8	-0.4	0.4	0.8	0.8	-0.1	8.2

* Includes the contribution of non-tax price changes in tobacco and alcoholic beverages as well as the effect of the residual term and the dummy variable used for the last quarter of 2007.

Exchange rate developments, tax hikes and unit labor costs were other main drivers of inflation with a contribution of 1.1 points, 0.7 points and 0.5 points each (Table 1). While the contribution of import prices has changed substantially each year mainly due to oil price fluctuations, import prices provided a mere contribution of an average 0.2 points to inflation in the entire inflation targeting period. The contribution of the output gap on inflation also varied over years, while on average, the contribution was only 0.3 points since the effects were cyclically offset by each other by definition. It should also be noted that the part of inflation that cannot be explained by fundamental macroeconomic variables, which is therefore attributed to rigidity, is around 3 points (Chart 1).

Chart 1. Contributions to CPI Inflation
(Percentage Points)

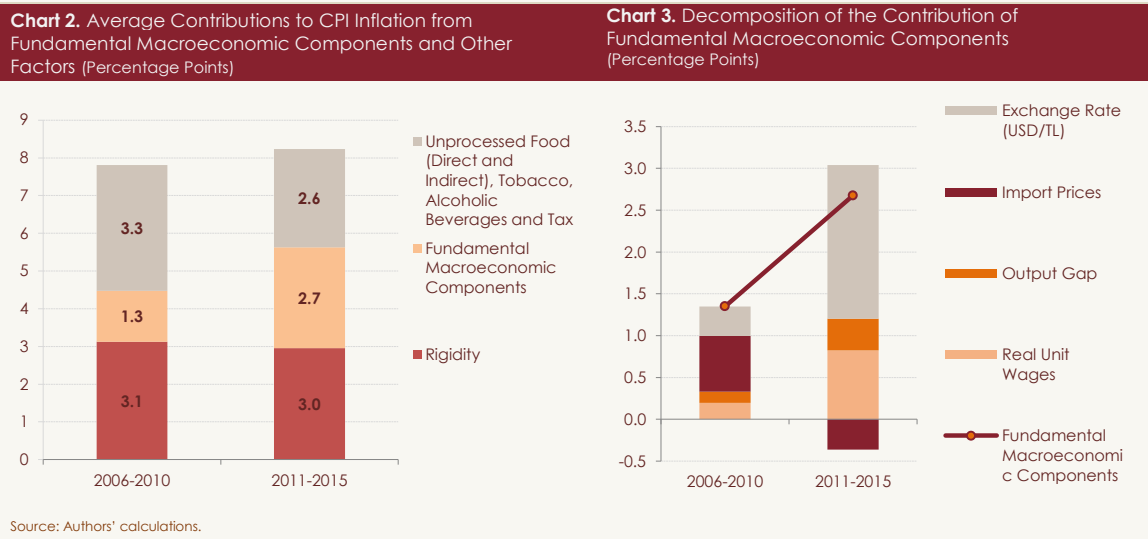


* Forecast. It should be noted that the estimated contributions may vary depending on model specification and the sample size. Source: Authors' calculations.

Inflation Dynamics in the First and the Second Half of Inflation Targeting Period

A comparison between the period of conventional inflation targeting regime from 2006 to 2010 and the subsequent unconventional policy episode from 2011 to 2015 with multiple objectives and multiple tools reveals that the average inflation is similar during both periods, yet the decomposition of inflation differs widely between these episodes. In order to have a better understanding of these differences, Chart 2 presents the contribution of fundamental macroeconomic factors to inflation as well as that of other factors in aggregated terms. It is striking that the contribution of fundamental macroeconomic factors

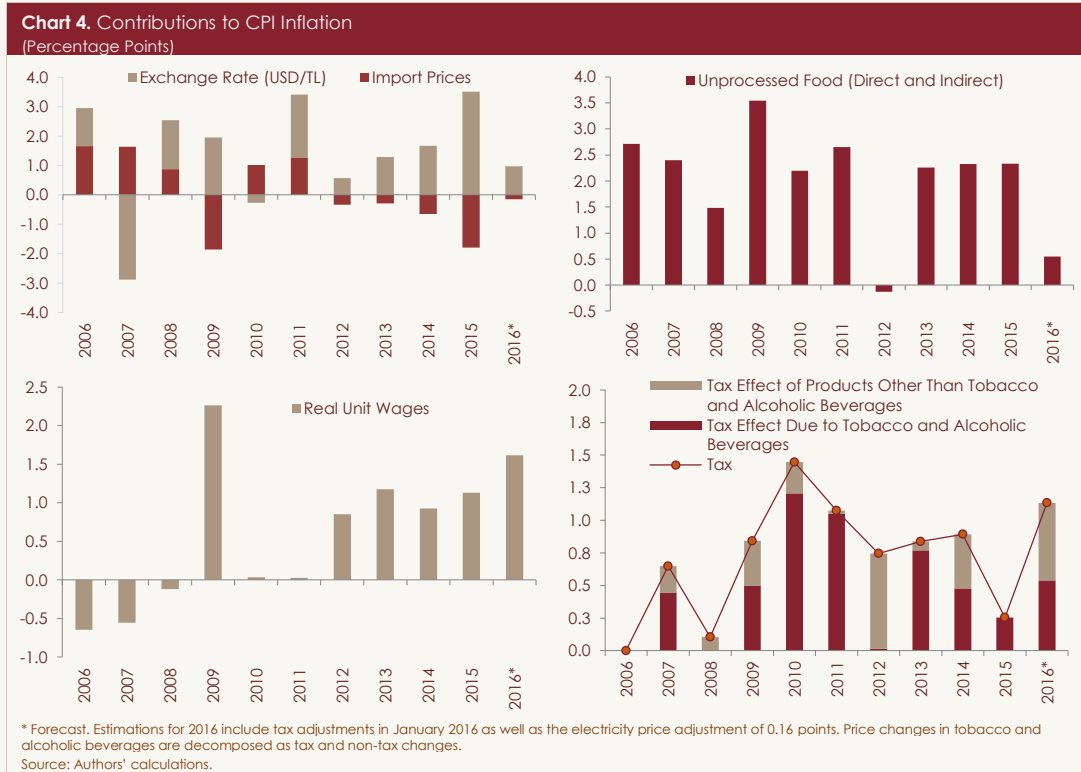
to inflation was up 1.4 points in the second five-year episode (Chart 2), whereas non-core drivers such as unprocessed food, tobacco and alcoholic beverages made a smaller contribution. Chart 3 provides a breakdown of the contribution of fundamental variables by five-year episodes. Accordingly, inflation dynamics were highly affected by exchange rate and real unit wages in the second episode, which is marked by the use of macroprudential policies.



The first half of the inflation targeting regime includes the periods of strong global growth as well as the global crisis and the rapid recovery period observed after the crisis. Except for 2009, this five-year episode is characterized by strong pressures on commodity prices driven by global demand pressure; hence, it witnessed a substantial contribution (an average of 0.7 points) from USD-denominated import prices to consumer prices (Table 1). In the second half of the inflation targeting period, the global economy started to slow down while commodity prices, oil prices in particular, fell remarkably. Thus, unlike the first period, import prices brought inflation down by -0.4 points on average in this period.

While the weakening of global growth and the risk appetite since 2013 affected inflation favorably through commodity prices, it exerted upward pressure through capital flows and the exchange rate channel. For better tractability of the contributions in recent years, Chart 4 shows the contribution of the main determinants to inflation by years. Accordingly, especially after the Fed's tapering signal in May 2013, capital flows towards emerging market economies lost pace, which determined the course of exchange rates. Moreover, measures taken to contain macrofinancial risks were another factor affecting exchange rates. In this period of both nominal and real depreciation of TL against foreign currencies, the contribution of exchange rates to annual inflation increased by approximately 1.4 points from the previous five-year episode and reached 1.8 points on average.³ In other words, during the period of 2011-2015, the upward effect of exchange rate developments on inflation outweighed the favorable contribution of external prices (Chart 4).

³ In the three-year period following the Fed's tapering decision (2013-2015), exchange rates added an average of 2.2 points to annual inflation.



Unprocessed food prices made a major contribution to consumer inflation through their direct and indirect effects in both periods of inflation targeting. The average contribution was 2.5 points in the first period but was lower in the second period due to the moderate course of unprocessed prices in 2012. However, with an average contribution of 2.3 points and the persisting volatility in unprocessed food prices, predictability declined remarkably in the following period of 2013-2015, suggesting that price developments in this category have a structural dimension as well (Chart 4).

Another macroeconomic driver of inflation, which has had an increasingly higher contribution to inflationary pressures in recent years, is the real unit wages. In the first period of inflation targeting, the contribution of real unit wages to inflation was relatively limited at 0.2 points on average amid rapid growth and productivity gains. During the second half, inflationary pressures driven by labor cost increased significantly due to heightened nominal wage increases and subdued productivity growth. Real unit wages posed no inflationary pressures during 2011, which was marked by robust growth and productivity gains, but added about 1 point to inflation per year in the following four years due to accelerating nominal wages (Chart 4).

An additional driver of inflation in Turkey is tax adjustments to maintain fiscal balance. The contribution of tax adjustments on inflation fluctuates through years, which makes tax adjustments a significant factor adding to inflation uncertainty. This contribution was 0.6 and 0.8 points, respectively, in the first and second half of the inflation targeting period (Table 1). It is estimated that the contribution of fiscal measures and the tax adjustments to products such as tobacco and alcoholic beverages in January and the September tax hike in fuel oil to inflation will exceed 1 percentage point in 2016 (Chart 4).

Conclusion and Assessment

Although various approaches were adopted in the first and second five-year periods of inflation targeting in Turkey, price stability could not be achieved completely, which caused inflation to hover around 8.2 percent on average during the last decade. Yet, in terms of main determinants, inflation dynamics changed dramatically over the first and second half of the inflation targeting period. In the first five-year episode of conventional inflation targeting, inflation was mostly driven by external factors, whereas in the second five-year period, fundamental macroeconomic variables, which are also linked to inflation expectations such as wages and exchange rates, were more influential. This observation suggests how critically important it is to manage expectations effectively to achieve price stability in the upcoming period. Therefore, the CBRT's price stability oriented policy stance as well as the support from other relevant parties to expectation management may minimize, to some extent, the trade-offs resulting from the fight against inflation.

Findings of this study confirm the need to show joint efforts in tackling structural challenges to see real progress towards price stability. In this regard, also considering this historical accounting of inflation, other policy implications are summarized as follows: (i) The role of food prices in the inflation process points to the importance of addressing structural issues, especially of the work done by the Food Committee; (ii) The predominant role of the exchange rate on core inflation reveals that issues such as improving the current account balance by increasing the savings rate and reducing dollarization and dependency on imported inputs are at least as important as demand management policies; (iii) The high and volatile contribution of taxes on inflation highlights the importance of fiscal and monetary policy coordination in the disinflation process; (iv) The increasing unit labor cost pressures on inflation in recent years suggest that structural regulations to bolster productivity and increase labor market flexibility are crucial for price stability.

In sum, findings indicate that price stability can be achieved not only by a decisive policy stance by the CBRT but also by steps to be taken on the structural front. Therefore, a holistic approach incorporating joint efforts of all agents in the disinflation process will ease policy trade-offs and make a significant contribution to the achievement of lasting price stability at a lower cost.

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Box
3.2

The Impact of the Tourism Slump on Food Inflation

Spending on food and beverages constitutes a significant portion of the tourism revenues. Hence, changes in the number of tourists may cause fluctuations in the overall food demand. According to 2016 tourism statistics, the total number of tourists was down 32 percent year-on-year in the January-August period. Therefore, food demand fell across the whole country and inflation excluding fresh fruits and vegetables posted a marked slowdown through 2016. In light of these observations, this box gives an analysis of the relation between the number of tourists and domestic food prices.

Tourism activities and the number of tourists may differ across regions. Thus, the impact of the tourism-driven decline in food demand on food prices should better be analyzed through a breakdown of the number of tourists and food prices by regions. Regional food prices are obtained from the TURKSTAT's monthly regional food prices index, while the food demand of tourists can be captured by the monthly food spending of tourists by regions. However, due to the absence of such data, the monthly number of tourists by regions is used as a proxy. Assuming that food expenditures are rather autonomous compared to other expenditures and average per capita spending on food barely changes over years, the number of tourists is assessed to be a plausible indicator for food spending.

Instead of the current number of tourists, the year-on-year change in the number of tourists per region is used in the estimations. This is due to the strong seasonality observed in the number of tourists as well as the fact that expected number of tourists for a specific month is generally determined by the number of tourists for the same month of the previous year. In this respect, supply conditions are dependent on tourism expectations for the relevant region and month, while the actual number of tourists to be below or above these expectations causes food prices to change. Therefore, using the year-on-year change in the number of tourists may capture any effect that may be observed due to changes in the numbers of tourists (particularly for 2016). Also, using numbers of tourists in year-on-year terms remedies the non-stationarity of the series.

The effect arising from the changing number of tourists might vary based on the supply of regional food products. For example, in a region with relatively larger supply, prices are expected to be less affected by a demand shock. Due to the impossibility to measure food supply per region, regional demand is proxied by regional population assuming that an equilibrium exists between supply and demand. In sum, the key explanatory variable in the regression equation is the year-on-year change in the ratio of the number of tourists per region to regional population. For simplicity, this variable is called the yearly change in the relative number of tourists.

The independent variable used in the equation is the monthly change in regional food prices. Assuming a New Keynesian framework, the Phillips curve equation for food inflation includes the yearly change in the relative number of tourists, marginal costs represented by the cyclical component of the food production index (the deviation of food production from the path estimated by the Hodrick-Prescott filter),

and the food import price index to capture import costs. In addition, to control for effect driven by the domestic supply, the fresh fruit and vegetable price index was also included in the model. In fact, prices in this subcategory fluctuate usually due to supply conditions and might affect other food prices. The model uses the seasonally adjusted price indices for food and fresh fruits and vegetables.

The analysis is based on a fixed effects panel data model where the standard errors are clustered by region. The model also includes seasonal dummy variables. The panel data model can be represented as follows:

$$\pi_{i,t}^{food} = \alpha + \beta_{1,i}xrelnumtur_{i,t} + \beta_2\pi_{i,t}^{fruitveg} + \beta_3foodp_t + \beta_4\pi_t^{foodm} + \sum_j \delta_j d_j + \varepsilon_{i,t}$$

In the equation, i and t denote region and time; $\pi_{i,t}^{food}$ stands for the monthly food inflation, while $\pi_{i,t}^{fruitveg}$ denotes the monthly inflation in fresh fruits and vegetables; $xrelnumtur_{i,t}$ is the yearly change in the relative number of tourists; $foodp_t$ represents the cyclical component of the food production index; π_t^{foodm} denotes the monthly inflation rate in the imported food prices, d_j refers to seasonal dummies and $\varepsilon_{i,t}$ is the error term. All data are obtained from the TURKSTAT. The estimation period is from January 2005 to July 2016. Given that the effect of tourists on food inflation changes by region, $\beta_{1,i}$ coefficient is allowed to vary across regions.

The effect of the tourism slump on food inflation can be calculated using the estimation results. To calculate the effect on end-2016 food inflation, the number of tourists in 2016 is assumed to drop by 30 percent on an annual basis in line with the projected decline in tourism revenues for 2016. To this end, Table 1 shows countrywide effects as well as regional effects for selected regions including Istanbul, Antalya, Izmir and Muğla, where economically significant and sizeable effects are observed (Table 1). According to the findings, regions with a higher relative number of tourists (the ratio of the number of tourists to regional population) experience a more marked contraction, while Istanbul is hit hardest by the slump.

Chart 1. Annual Food Inflation in Selected Regions (Percentage Points)

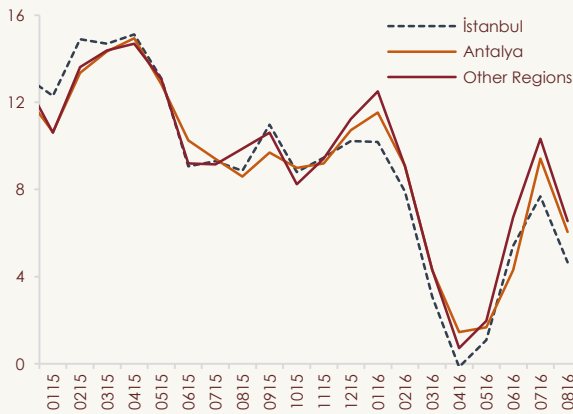


Table 1. Contribution of Tourism Slump to Food Inflation in Selected Regions (Percentage Points)

Regions	Contribution to Regional Food Inflation	Contribution to National Food Inflation*
Istanbul	-5.56	-1.23
Antalya, Isparta, Burdur	-4.91	-0.17
Muğla, Aydın, Denizli	-1.54	-0.05
İzmir	-2.07	-0.13

* Contribution to national food inflation is computed by using regional weights.

After aggregating the regional effects, the tourism slump is expected to have a total of –1.7 points contribution to end-2016 food inflation. The recent divergence in regional food inflation confirms this empirical evidence (Chart 1). In fact, food inflation has been relatively lower in Istanbul and Antalya, which experienced the highest drop in the relative number of tourists.

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