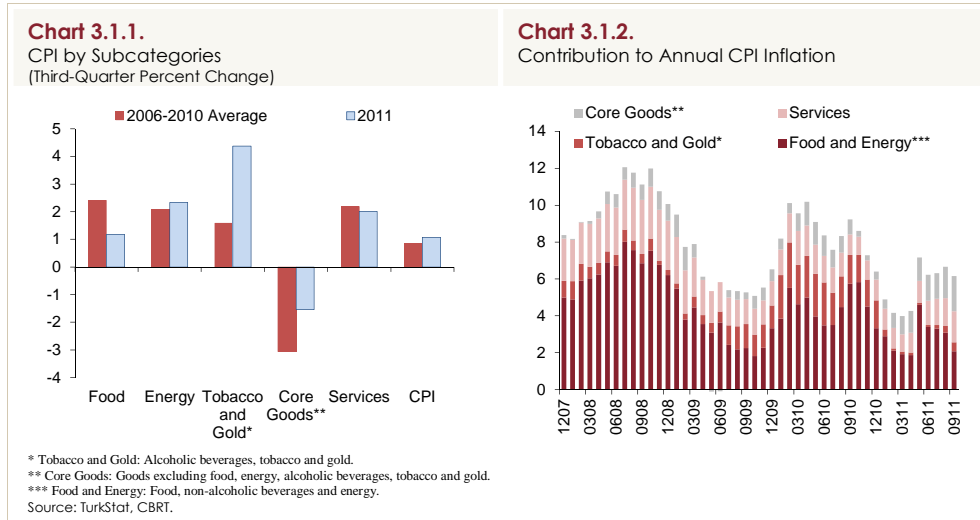


3. Inflation Developments

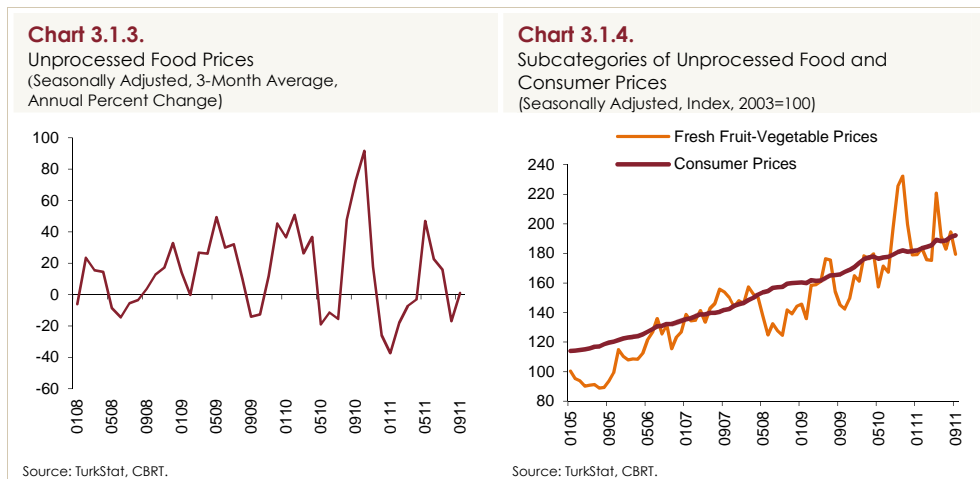
3.1. Inflation

Consumer prices increased by 1.07 percent in the third quarter of 2011, while annual inflation went down to 6.15 percent with a limited quarter-on-quarter decline. Depreciation of the TL stood as the leading factor in inflation dynamics in this period. Annual food inflation posted a drastic decline due to the base effect driven by unprocessed food prices, whereas core inflation indicators went up owing to the exchange rate developments. Prices of core goods were particularly influenced by the exchange rate developments, while prices of services maintained their benign course. Despite the ongoing decline in international commodity prices, pressures driven by producer prices remained strong mainly due to the exchange rate effect.

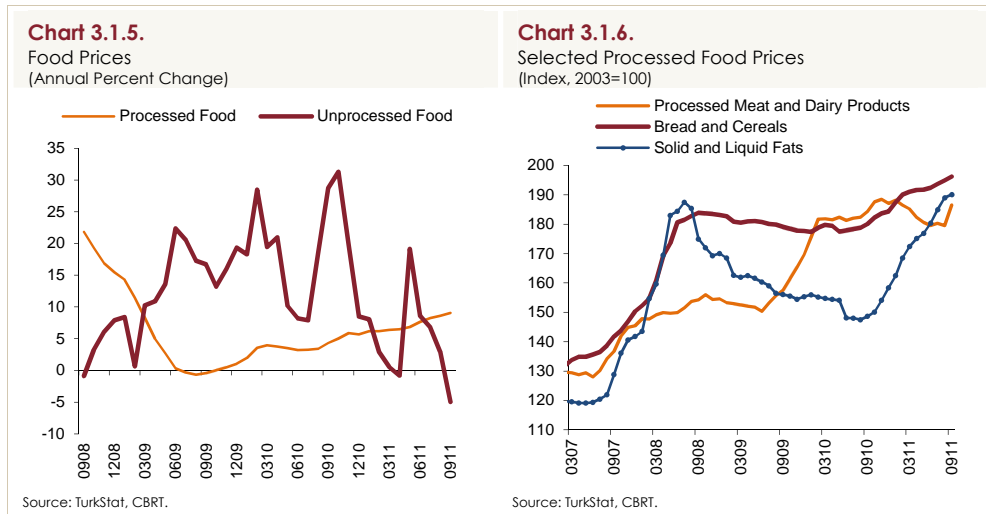
Across subcategories, the rate of quarterly price changes was up from the average of previous years excepting the prices of food and services (Chart 3.1.1). The course of prices of core goods was affected by exchange rate developments and cumulative cost increases. In spite of the decline in international energy prices, the increase in domestic energy prices surpassed the average of the past years due to the weak course of the Turkish lira. On the food front, prices registered a lower increase compared to previous years owing to the favorable course of unprocessed food prices. Gold prices boosted in this quarter, reflecting upon annual consumer inflation as 0.25 percentage points (Chart 3.1.2). The underlying trend of services prices maintained its benign course in items other than transport. Consumer inflation is expected to rise in the last quarter due to the increases in administered prices and the unfavorable base effects led by the food prices. It is assessed that the lagged effects of exchange rate developments would persist, however, the secondary effects of price movements driven by exchange rate developments would remain limited amid the slowdown in the economic activity.



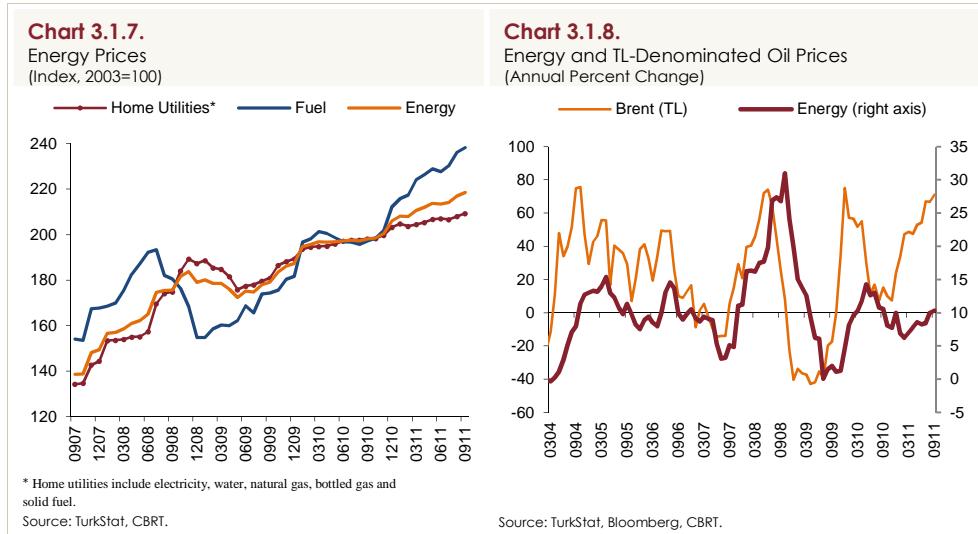
Having followed a volatile course in the first two quarters, food inflation plummeted by 5.9 percentage points to 2.23 percent as envisioned in the July Inflation Report. This is mainly attributable to the base effect led by the food prices. Prices displayed a moderate outlook in the last quarter excepting the base effect (Chart 3.1.3). Showing a decline, the prices of fresh fruits and vegetables led the favorable course of the food prices (Chart 3.1.4). Increases were registered in other unprocessed food prices, particularly in red meat (by 8.04 percentage points). Seasonally adjusted data more clearly reveal the base effects stemming from unprocessed food prices. Unprocessed food prices, which posted an increase far beyond the seasonal trend in the third quarter of 2010, displayed a sharp decline in the last two months of the same year. In this context, the base effect stemming from unprocessed food prices will have an adverse effect on food, and hence, on consumer inflation in November and December.



Processed food inflation surged by 1.42 percentage points to 9.07 percent in this quarter (Chart 3.1.5). This was mainly caused by oils and fats prices with an annual inflation reaching 27.89 percent and registering increases parallel to both international and domestic developments (Chart 3.1.6). Moreover, despite the decline in imports prices, the dramatic depreciation of the Turkish lira had adverse repercussions across the processed food prices in general, pushing them up by 3.03 percent, far beyond the averages of the previous years (Table 3.1.1).



Energy prices increased by 2.34 percent during the third quarter (Table 3.1.1). Although international oil prices were slightly down compared to the end of the second quarter, depreciation of the Turkish lira accelerated the surge in domestic fuel prices (Chart 3.1.7). Similarly, among home utilities, solid fuel and bottled gas prices also posted increases. Thus, annual inflation in the energy group reached 10.3 percent in September (Chart 3.1.8). It was stated in the July Inflation Report that sharp increases in TL-denominated oil prices might lead to increases in natural gas and electricity prices. As a matter of fact, natural gas and electricity tariffs were raised starting from October 1. Accordingly, annual inflation in the energy group is expected to boost in October to add 0.5 percentage points to annual consumer inflation.



The SCT rates were raised on some motor vehicles, mobile phones, alcoholic beverages and tobacco products by the Council of Ministers' decision, which was published on the Official Gazette on October 13, 2011. Tobacco products are estimated to become the largest contributor to consumer price hikes out of this tax rise, while the effect of other items is expected to remain limited. The estimation of the indirect tax on tobacco products and the final effect of the tax on consumer prices are analyzed in Box 3.2.

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

	2010			2011		
	III	IV	Annual	I	II	III
CPI	1.15	1.55	6.40	1.57	1.83	1.07
1. Goods	1.29	1.64	7.18	1.53	2.05	0.73
Energy	0.43	3.98	9.96	2.27	1.37	2.34
Food and Non-Alcoholic Beverages	7.02	-0.18	7.02	3.77	-2.46	1.18
Unprocessed Food	13.16	-3.05	8.52	5.08	-5.79	-1.00
Processed Food	1.69	2.59	5.68	2.61	0.57	3.03
Goods (excl. Energy and Food)	-2.96	2.21	6.09	-0.68	6.32	-0.36
Core Goods	-3.45	2.59	1.70	-1.08	7.73	-1.55
Durable Goods (excl. Gold)	-0.34	-1.06	0.26	4.26	1.85	3.69
Alcoholic Beverages, Tobacco and Gold	-1.27	0.93	24.61	0.81	1.05	4.38
2. Services	0.73	1.31	4.24	1.67	1.22	2.02
Rent	1.30	0.98	3.96	1.08	0.99	1.35
Restaurants and Hotels	1.56	2.30	9.76	1.65	1.80	2.37
Transport	1.83	1.28	7.04	2.28	2.10	3.07
Communication	-2.90	2.23	-3.51	1.96	-1.71	0.35
Other Services*	1.19	0.30	3.57	1.61	2.14	2.56

* Services excluding rents, restaurants and hotels, transport and communication.
Source: TurkStat, CBRT.

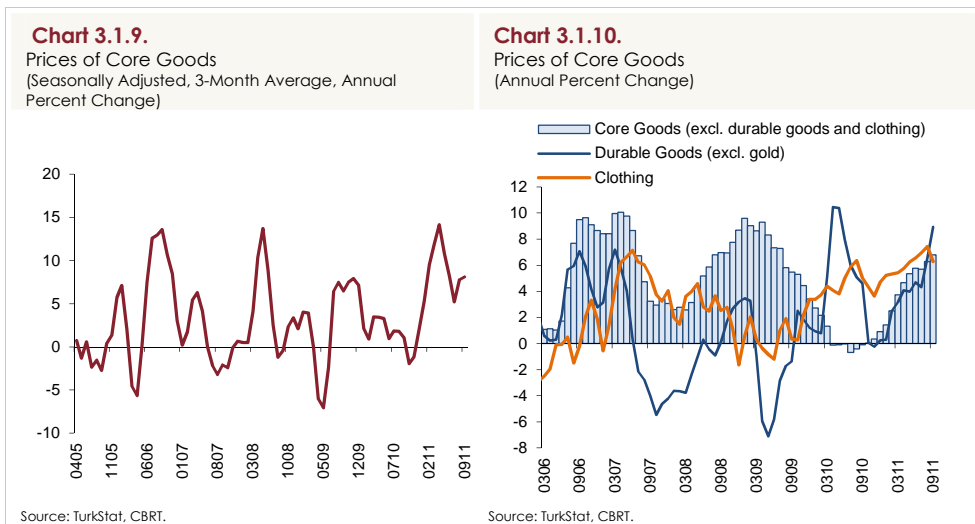
Annual inflation in core goods reached 7.64 percent in September amid the ongoing depreciation of the Turkish lira. Following a deceleration in the previous quarter, seasonally adjusted data point to a pick-up in core inflation in the third quarter (Chart 3.1.9). Price increases in durable goods, mainly automobile and furniture, were instrumental in this development in the third

quarter (Table 3.1.2 and Chart 3.1.10). Meanwhile, following a stable increase since November 2010, annual inflation in clothing went down in September (Chart 3.1.10). However, this is envisaged to reflect the temporary effects exclusive to the sale season, and clothing prices are expected to speed up in the last quarter due to adopted measures in imports of textiles and ready-wear.

Table 3.1.2.
Prices of Core Goods
(Quarterly and Annual Percent Change)

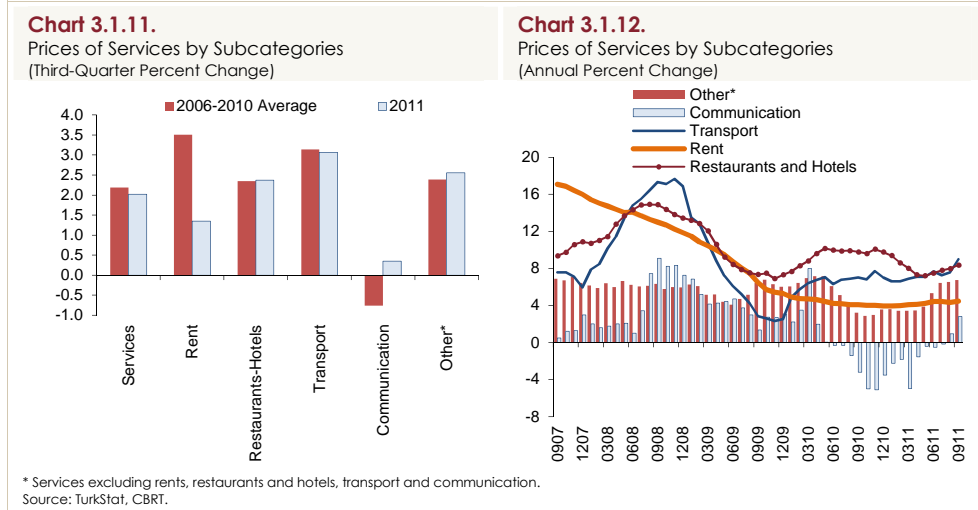
	2010			2011		
	III	IV	Annual	I	II	III
Core Goods	-3.45	2.59	1.70	-1.08	7.73	-1.55
Clothing and Footwear	-11.90	9.94	4.72	-12.04	25.08	-12.13
Durable Goods (excl. Gold)	-0.34	-1.06	0.26	4.26	1.85	3.69
Furniture	1.77	-1.06	5.94	0.75	5.04	2.88
Electrical and Non-Electrical Appliances	-0.85	-0.23	-2.23	2.87	-1.26	0.34
Automobile	-0.61	-1.67	-0.26	6.31	2.29	5.68
Other Durable Goods	-1.81	0.90	1.79	2.15	2.71	1.85
Other	0.58	1.18	0.91	1.82	2.09	1.54

Source: TurkStat, CBRT.

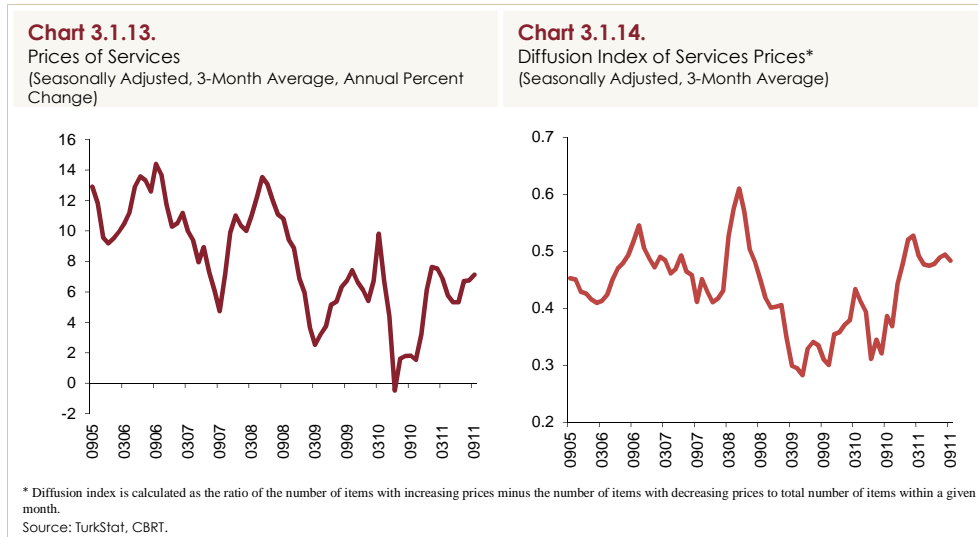


Prices of services surged by 2.02 percent, a rate close to historical averages (Chart 3.1.11). Among subcategories, rents displayed a favorable outlook compared to the previous quarter, while the rate of increase in prices of transport, restaurants and hotels remained unchanged from the previous periods. Stimulated by costs and the base effect in the third quarter, the annual rate of increase in the prices of services rose by 1.34 percentage points to 6.36 percent quarter-on-quarter. Particularly, the cumulative increases in fuel and processed food prices reflected on the prices of transport, restaurants and hotels (Chart 3.1.12). Meanwhile, prices for communication services posted a quarter-on-quarter increase, and annual inflation continued to rise due to the base effect. Regarding services, the impact of the depreciation in the Turkish

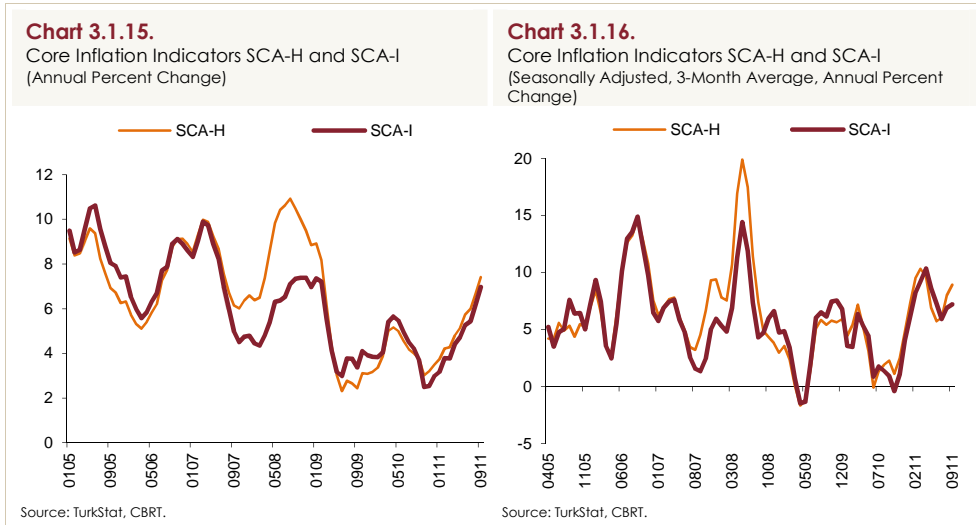
lira remained limited on the prices in certain groups like transport and other services.



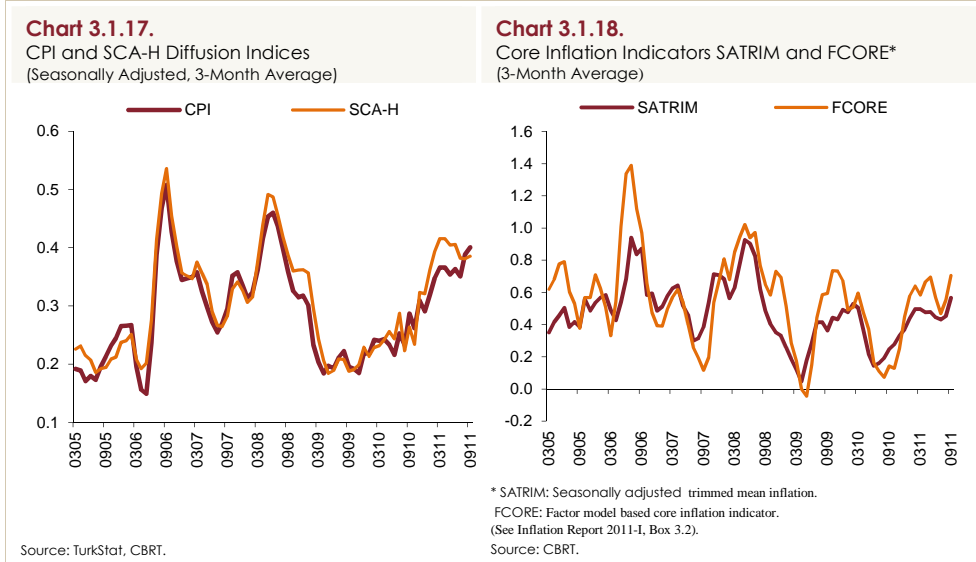
Seasonally adjusted indicators point to an increase in the underlying trend of services price inflation in this quarter, following a downtrend in the first half of the year (Chart 3.1.13). On the other hand, the diffusion index, showing the ratio of items with increasing and decreasing prices to overall items in this subcategory, remained partly horizontal (Chart 3.1.14).



The annual rate of increase in core inflation indicators SCA-H and SCA-I continued to trend upward in the third quarter amid the developments in core goods inflation (Chart 3.1.15). Meanwhile, seasonally adjusted data indicate an upward trend starting from the third quarter (Chart 3.1.16).

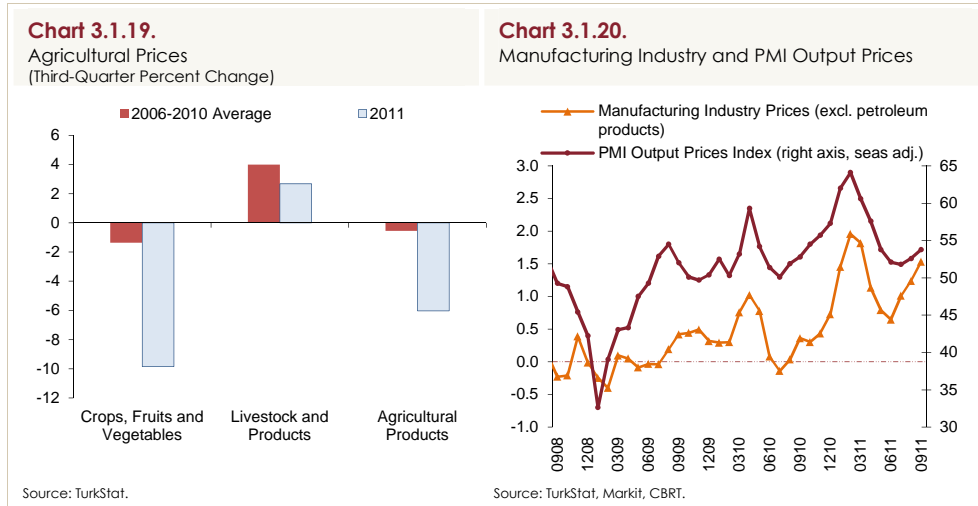


SCA-H diffusion index displays a rather flat outlook in the underlying inflation (Chart 3.1.17). On the other hand, alternative core inflation measures monitored by the CBRT were up compared to the second quarter (Chart 3.1.18).

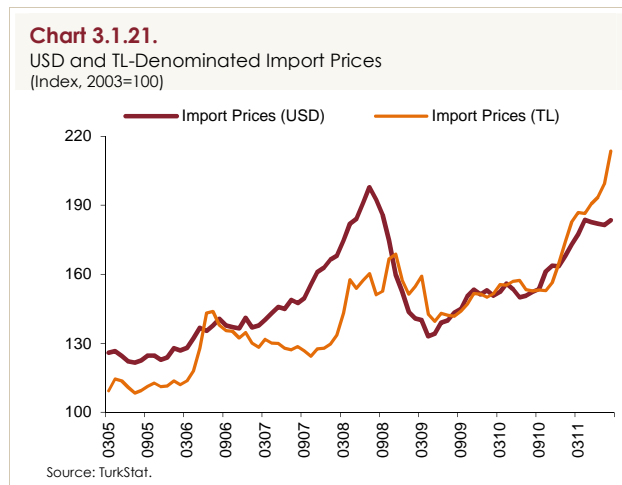


Producer prices soared by 3.31 percent in the third quarter, while annual inflation amounted to 12.15 percent at the end of the quarter (Table 3.1.3). Amid falling prices of crops and fruits-vegetables, which also reflected on consumer inflation, agricultural prices went down by 6.03 percent. On the other hand, producer prices for livestock breeding posted an increase in this period (Chart 3.1.19 and Table 3.1.13). Crops, used as inputs for the manufacturing

industry, also followed a moderate course in this period. Sunflower prices, which previously posed a significant pressure on consumer prices through prices of fats and oils, remained unchanged in this period. Moreover, wheat and cotton prices also went down in this quarter, alleviating the cost pressures on bread and cereals.



The course of producer prices was mainly influenced by exchange rate developments in this quarter. The slowdown in international commodity prices, which started in the second quarter, gained momentum in the third quarter. Nevertheless, the significant depreciation of the Turkish lira increased TL-denominated import prices, leading to a re-acceleration of the manufacturing industry inflation (Charts 3.1.20 and 3.1.21). Thus, manufacturing industry prices excluding oil, rose by 4.67 percent in the last quarter, while the cumulative increase recorded since the onset of the year reached to 12.63 percent (Table 3.1.3). Although these price increases were reflected across all subcategories, producer prices were mainly affected through soaring prices of food, base metal, electrical machinery and equipment, and motor vehicles in this period. It is notable that the rise in costs spilled over into consumer prices through these channels, particularly through the durables. As this points to a sizeable cumulative effect, the rise in producer prices is believed to further weigh on consumer prices in the rest of the year.



Despite the ongoing strong pressures driven by producer prices, the relatively lower spillover effect of these increases into consumer prices compared to previous periods, signifies the role of demand conditions on the pricing behavior. Meanwhile, the probability that the depreciation of the Turkish lira may gradually be perceived as more permanent appears as a risk factor that may influence the extent of the exchange rate pass-through.

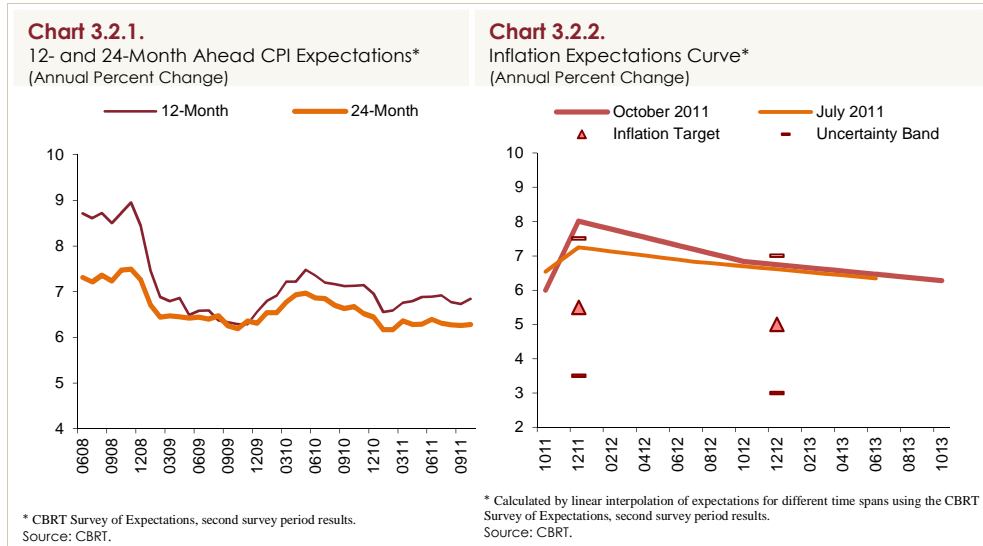
Table 3.1.3.
PPI and Subcategories
(Quarterly and Annual Percent Change)

	2010			2011		
	III	IV	Annual	I	II	III
PPI	1.51	2.21	8.87	5.40	0.77	3.31
Agriculture	1.71	0.26	14.52	5.84	-1.73	-6.03
Crops, Fruits and Vegetables	2.78	-3.17	9.20	6.81	-2.67	-9.84
Livestock and Animal Products	6.23	8.21	29.85	-1.26	-0.39	2.68
Industry	1.46	2.64	7.71	5.31	1.30	5.24
Mining	3.75	0.95	7.11	9.70	1.08	4.94
Manufacturing	0.99	2.86	6.62	6.27	1.98	4.98
Manufacturing (excl. Petroleum)	1.09	2.20	5.92	5.55	1.95	4.67
Manufacturing (excl. Petroleum and Base Metals)	0.72	1.90	3.98	4.85	1.53	4.12
Electricity, Gas and Water	5.07	1.32	18.68	-4.08	-4.73	7.89

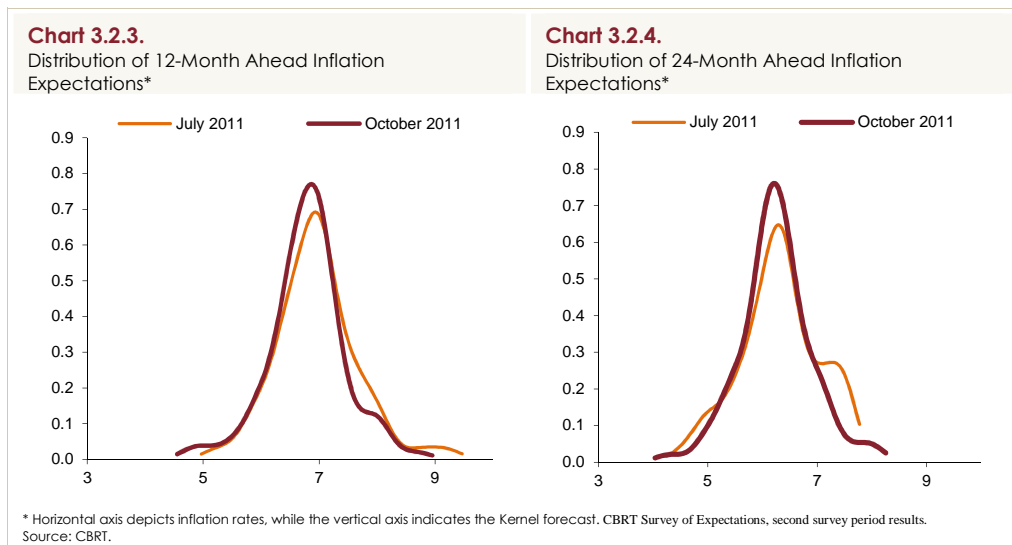
Source: TurkStat, CBRT.

3.2. Expectations

Having risen during the first half of 2011, inflation expectations remained relatively flat in the third quarter (Chart 3.2.1). Although inflation realizations in August and September were above expectations, medium-term expectations were not subject to a significant revision. Near-term inflation expectations were slightly down quarter-on-quarter (Chart 3.2.2). Currently, inflation expectations continue to hover above the year-end targets of 5.5 and 5 percent for 2011 and 2012, respectively.



The distribution of survey respondents' for both 12-month and 24-month ahead inflation expectations converged relatively in this period compared to July (Charts 3.2.3 and 3.2.4).



Box
3.1

Taxation of Tobacco Products and Its Effect on Prices

The main funding resource for governments is tax revenues. To this end, two types of taxes are collected. First type is made up of direct taxes like income tax collected on a certain ratio of income, whereas the second is indirect taxes levied on purchases of goods and services irrespective of the consumer's income. The most common example to indirect taxes is the Value Added Tax (VAT). In addition to VAT, Special Consumption Tax (SCT) is also collected in Turkey on some products including automobiles and technological products like mobile telephones as well as other products such as alcoholic drinks, tobacco products and fuel oil.

For the majority of the products under this scope, the base to apply for the calculation of the SCT is defined in the Article 11 of the Law on Special Consumption Tax No.4760 as "...is constituted by the components of the value added tax base excluding the special consumption tax to be calculated". In other words, the final consumer price is obtained by first adding SCT and then the VAT to the price set by the producer. However, for tobacco products, this rule is different such that the SCT base for tobacco products stated in the above law is not the producer's price,¹ but the product's retail price for final consumers. Therefore, this method gives us a non-linear taxation scheme which entails the collection of VAT on the calculated SCT, as well as the collection of SCT on the calculated VAT, since VAT is already included in the final consumer's price.

The relation between the unit producer price and the final sales price using this method can be illustrated by the following formula:

$$\text{Final Sales Price} = \text{Producer Price} + \text{SCT Amount} + \text{VAT Amount}$$

Using a mathematical illustration, this relation can be expressed as follows:²

<i>Final Sales Price (FSP):</i>	<i>Y</i>
<i>SCT Amount:</i>	<i>Y * sct</i>
<i>VAT Amount:</i>	<i>(X + Y * sct) * vat</i>
<i>Producer Price:</i>	<i>X</i>
<i>FSP = Y = X + [Y * sct] + [(X + Y * sct) * vat]</i>	

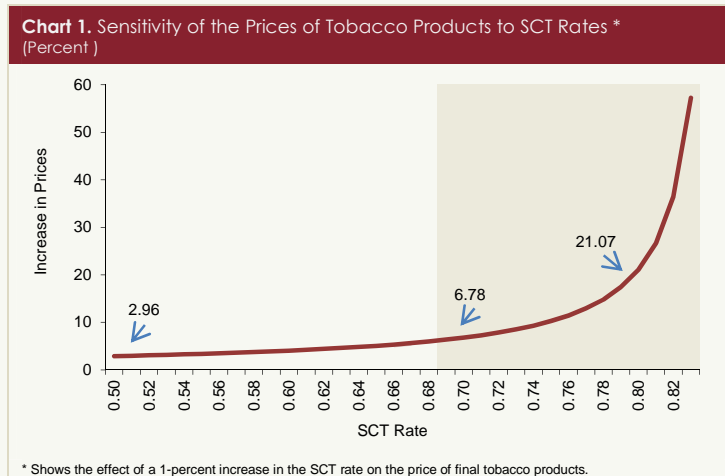
¹ The producer price in this Box refers to the non-taxed net price which includes the share of the producer as well as the dealer.

² The SCT and VAT rates are denoted as "sct" and "vat, respectively in the table. Amounts indicate the monetary sum corresponding to the said tax item. SCT base is the final sales price. VAT base is the sum of the producer price and the calculated SCT. The calculation method is displayed for the products subject to proportional SCT. The same method also applies to products subject to lump-sum SCT.

The final sales price (Y), given in the above equation, can be formulated as a function of the producer's price (X), the SCT rate (sct) and the VAT rate (vat) as follows:

$$FSP = Y = \frac{(1 + vat) * X}{1 - (1 + vat) * sct}$$

It is clear that when the producer's price (X) and the VAT rate (vat) are kept constant, an increase in the SCT rate (sct) increases the final sales price (Y). However, given the nature of the function, this relation is not linear. Assuming constant producer price and VAT rate, this non-linear relation clearly illustrates the rise in the final consumer price due to a 1-percent increase in the SCT rate (Chart 1). For example, under these assumptions, raising the SCT rate from 50 to 51 percent, 69 to 70 percent, and 79 to 80 percent results in a price increase in final tobacco products by 2.96, 6.78 and 21.07 percent, respectively. Thus, as the rate gets higher, the SCT rate-price increase curve gets steeper.



In sum, as tobacco products are taxed using a unique approach, the level of the SCT rates determine to what extent tax adjustments are reflected on prices. Hence, as the SCT rate increases, a lower adjustment in SCT rates would suffice to attain a certain amount of increase in tobacco prices.

Box
3.2

Updated Estimates of Exchange Rate and Import Price Pass-Through

For central banks having price stability as the main objective, understanding the short and medium-term effects of exchange rate movements on inflation (pass-through) is crucial with regard to the implementation of the monetary policy. Hence, during the transition to inflation targeting, the CBRT produced a series of studies on analyzing the effects of the exchange rates on inflation in Turkey, and publicly shared these studies on its website. However, both the impact of the global crisis and the changing macroeconomic dynamics called for an update in estimates of the pass-through. With a view to informing the public about the recent extent of the pass-through, and also, enhancing the reliability of the inflation forecasts, this Box shares the updated estimates of the CBRT experts with the public.³

In seeking an answer to the question of how the changes in exchange rate and import prices affect inflation, the vector autoregressive (VAR) model approach proposed by McCarthy (2000) is adopted. Unlike other studies, multiple models with various variables are employed, and pass-through estimates obtained from alternative VAR models are jointly presented. Accordingly, seven different VAR models are estimated in order to analyze pass-through for the March 2002-June 2011 period on a monthly frequency.

Estimated models display a triangular-causal system and allow pricing in various stages through the production chain, thereby providing information on to what extent a shock in any stage is passed through to the other stage. Findings on the speed and duration of the pass-through are derived from the results of the impulse-response function. In the most general model [Model 7: $(\tilde{y}_t, \Delta e_t^b, \pi_t^m, \pi_t^p, \pi_t^c, \Delta i_t)$], where the order of variables is determined according to the identification of shocks; output gap, the change in the exchange rate basket, monthly rate of increase of import prices in USD, manufacturing industry inflation, core consumer price indicator (CPI excluding unprocessed food and alcohol-tobacco), inflation and finally the first difference of the nominal benchmark interest rate are denoted by (\tilde{y}_t) , (Δe_t^b) , (π_t^m) , (π_t^p) , (π_t^c) and (Δi_t) , respectively. Other estimated models can be summarized as follows:

Model 1: $(\tilde{y}_t, \Delta e_t^{\text{USD}}, \pi_t^m, \pi_t^c)$

Model 2: $(\tilde{y}_t, \Delta(e_t^{\text{USD}} * m_t), \pi_t^c)$

Model 3: $(\tilde{y}_t, \Delta e_t^{\text{USD}}, \pi_t^m, \pi_t^p, \pi_t^c)$

³ For detailed information, see Kara and Ögünç (2011).

$$\text{Model 4: } (\tilde{y}_t, \Delta(e_t^{\text{USD}} * m_t), \pi_t^p, \pi_t^c)$$

$$\text{Model 5: } (\tilde{y}_t, \Delta e_t^b, \pi_t^m, \pi_t^c)$$

$$\text{Model 6: } (\tilde{y}_t, \Delta e_t^b, \pi_t^m, \pi_t^p, \pi_t^c)$$

Where, m_t is the import prices in USD, Δe_t^{USD} is the change in USD, and Δ the first difference operator.

Main Findings

Results of the cumulative impulse-response analysis are summarized in Table 1 for a 2-year period. The table depicts the cumulative response of the consumer price indicator (CPI excluding unprocessed food, alcohol and tobacco) to a 1-unit permanent shock in exchange rate basket, USD, import prices in USD and import prices denominated in TL, respectively. Estimates are given separately for two sample periods, one covering the whole sample and the other covering the pre-crisis period.

Table 1. Impact of a 1-unit Permanent Shock to Exchange Rate and Import Prices on Core Price Indicator: Summary of the Cumulative Impulse-Response Function Findings (Percent)

Sample Period: 2002:03-2011:06		Response of the Core Price Indicator				
		End of First Quarter	End of First Year	End of Second Year	Completion of 80 % of Pass-Through	
	Model	Number of Lags				
Shock to Exchange Rate Basket	Model 5	2	0.08	0.14	0.16	9 months
	Model 6	1	0.08	0.16	0.16	6-7 months
	Model 7	1	0.08	0.16	0.16	6-7 months
Shock to USD	Model 1	2	0.09	0.15	0.18	10 months
	Model 1	2	0.05	0.08	0.09	11 months
	Model 3	1	0.06	0.11	0.12	6-7 months
Shock to Import Prices in USD	Model 3	2	0.06	0.10	0.12	11 months
	Model 1	2	0.10	0.18	0.20	9-10 months
	Model 3	1	0.11	0.20	0.21	7-8 months
	Model 5	2	0.10	0.16	0.18	9 months
	Model 6	1	0.08	0.14	0.16	9-10 months
	Model 7	1	0.08	0.15	0.17	9 months
Shock to Import Prices in TL	Model 7	2	0.09	0.16	0.17	9 months
	Model 2	2	0.08	0.15	0.17	9 months
Sample Period: 2002:03-2008:07						
Shock to Exchange Rate Basket	Model 2	2	0.08	0.15	0.17	9 months
	Model 4	2	0.08	0.15	0.17	9 months
	Model 5	1	0.09	0.20	0.23	10-11 months
Shock to USD	Model 6	1	0.09	0.20	0.23	10-11 months
	Model 7	1	0.10	0.21	0.23	10 months
	Model 1	1	0.08	0.20	0.23	11-12 months
Shock to Import Prices in USD	Model 3	1	0.09	0.18	0.21	13 months
	Model 1	1	0.12	0.27	0.32	14 months
Shock to Import Prices in TL	Model 3	1	0.12	0.26	0.32	14 months
	Model 5	1	0.06	0.14	0.17	11 months
	Model 6	1	0.06	0.14	0.16	12 months
	Model 7	1	0.07	0.15	0.18	11-12 months
Shock to Import Prices in TL	Model 2	1	0.08	0.18	0.22	13-14 months
	Model 4	1	0.08	0.18	0.22	13-14 months

Source: Kara and Ögünç (2011).

An analysis of the pass-through from exchange rates to core consumer prices suggest that the cumulative effect for the exchange rate basket reaches around 15 percent by the end of the first year, while it is around 10 percent for the USD in the same period. Pass-through estimates for import prices in the USD have a wide range between 14 and 20 percent for this period (16 percent on average), and the reflection of a change in import prices in Turkish lira on prices amounts to around 15 percent at the end of the first year. Findings indicate that import price pass-through is as important as the exchange rate pass-through on consumer price dynamics in Turkey.

In short, estimates point that the pass-through of the exchange rate and import prices for a 1-year period is around 15 percent. In other words, a permanent 10-percent increase in the exchange rate causes the core price indicator to go up by 1.5 percent on a cumulative basis within a year.

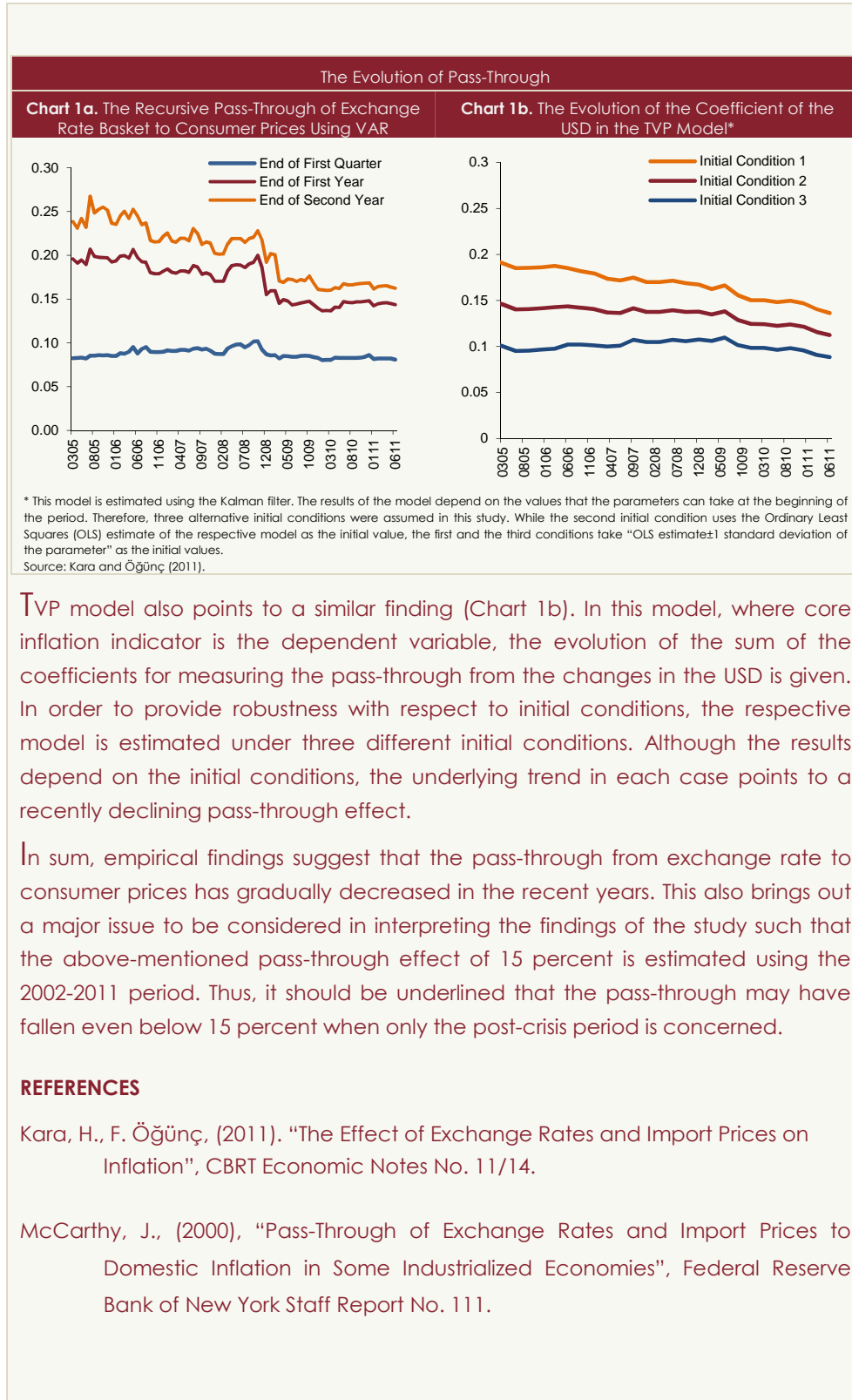
Overall, it is seen that most of the pass-through effect is completed within a 1-year period. Moreover, as illustrated in Table 1, pass-through is higher in the sample period that excludes the post-crisis period. For example, in the 1-year period before the crisis, approximately 20 percent of the change in the exchange rate basket was reflected on core consumer prices, while this ratio fell to 15 percent for the whole sample. This finding brings out the question of whether the pass-through from the exchange rate to domestic prices has varied over time.

Is the Exchange Rate Pass-Through Declining in Turkey?

Two separate analyses were conducted in order to assess whether pass-through varies over time. Recursive cumulative impulse-response function estimates with the VAR method were used in the first one, while the results obtained by the time-varying parameter (TVP) model were used in the second one.

The evolution of the cumulative reaction of the core price indicator to a 1-percent increase in the exchange rate basket is given in Chart 1a.⁴ While findings suggest that short-term pass-through (3 months) remained virtually unchanged over time, they point that medium-term pass-through (for 1 or 2-year periods) gradually decreases. For example, while pass-through effect for one year is estimated as 20 percent for observations up to 2006, it goes down to 15 percent when the current data are included. The change in pass-through estimates is particularly notable during the severe times of the global financial crisis.

⁴ In this exercise, the VAR model was estimated recursively by increasing the sample size one by one. All the cumulative response results obtained for each period were presented for the ends of different periods (first quarter, first and second year-end). Results were obtained by estimating Model 5, which includes the exchange rate basket, with two lags.



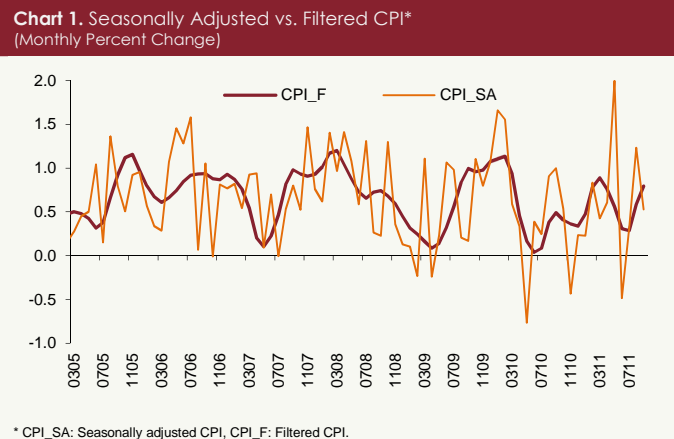
Box
3.3

Filtering Short-Term Fluctuations in Price Series

Price indices, like many other economic time series, are subject to seasonal fluctuations. Seasonal adjustment is a strong tool that enables to remove such fluctuations which prevents to detect the real changes in the series. However, as seasonal adjustment can only capture the movements repeated in certain seasonal frequencies, it may also cause series to be highly volatile, thus complicating the interpretation of the underlying trend. In other words, in the event that the series contains repeated movements in non-seasonal frequencies, seasonal adjustment may fail to filter out short-term fluctuations completely.

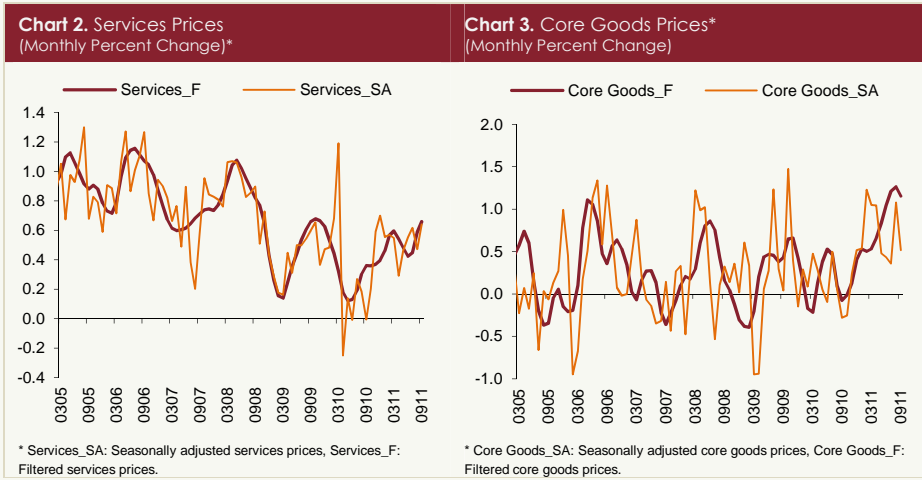
Against this background, by combining the wavelet filter with the band-pass filter, Akkoyun et al. (2011) propose a 2-step method in order to capture short-term fluctuations that are completed in a 1-year period. The method proposed by the above study yields smoother series than the seasonally adjusted ones and the obtained filtered series also successfully capture the dynamics in the subcategories of the consumer prices. In this Box, the method by Akkoyun et al. (2011) and the recent inflation trends will be analyzed.

Firstly, this method aims at removing the short-term fluctuations in the price series. Short-term fluctuations are defined as price cycles that are completed within a 1-year period. In this context, firstly, price cycles which are completed within 2-8 months are removed by the wavelet filter, and in the second step, the cycles which are completed within 8-12 months are removed by the band-pass filter.⁵ Filtered CPI series are shown in Chart 1.



⁵ Details on the selection and application of the filters used are available in Akkoyun et al. (2011).

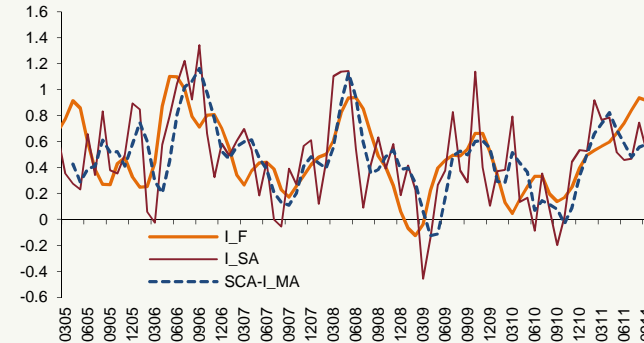
As depicted in Chart 1, monthly percent changes in filtered series are smoother than the seasonally adjusted ones. The advantage of filtering in order to monitor the short-term fluctuations in price series is more pronounced for the subcategories that are more often subject to non-periodical shocks. For example, while filtered series and seasonally adjusted series for prices of services display a relatively similar pattern, the same conclusion does not apply to the prices of core goods (Charts 2 and 3).



As illustrated, short-term movements in prices of services mostly occur at seasonal frequencies, whereas, short-term fluctuations other than seasonal ones are also present in the prices of core goods. Therefore, seasonally adjusted data should be interpreted more carefully in these types of series.

Interpreting the recent developments using the above method reveals that the monthly percent change in the prices of services increased in the third quarter, whereas, the monthly percent change in core prices has considerably accelerated since the start of the year. Accordingly, the I index, which is formed by the filtered prices of services and core goods, maintained its uptrend in the third quarter as well (Chart 4). Moreover, this trend resembles the trend obtained by taking the 3-month moving averages of the seasonally adjusted I index.

Chart 4. Seasonally Adjusted I vs. Filtered I*
(Monthly Percent Change)



* Filtered I series is constructed by filtered services and core goods series.*I_SA: Seasonally adjusted I, I_F: Filtered I, I_F: I series with 3-month moving average.

Analysis of the evolution of short-term inflation is quite important not only for the central bankers but also for other policymakers. However, the fact that the inflation is subject to various shocks and it has a heterogeneous nature complicates the above analysis, thereby requiring the use of alternative methods other than the traditional ones. In this respect, the main subcategories of consumer prices filtered by this method summarized in this Box, and finally the derived I index are found to be smoother than the seasonally adjusted indicators. The method can provide significant information especially about the core goods prices, which display non-seasonal short-term fluctuations. Lastly, the performance of the I series filtered by this method is comparable to the alternative core indicators calculated and monitored by the CBRT.

REFERENCES

Akkoyun, H. Ç., O. Atuk, N. A. Koçak and M. U. Özmen, (2011), "Filtering Short Term Fluctuations in Inflation Analysis", CBRT Working Paper No. 11/20.

