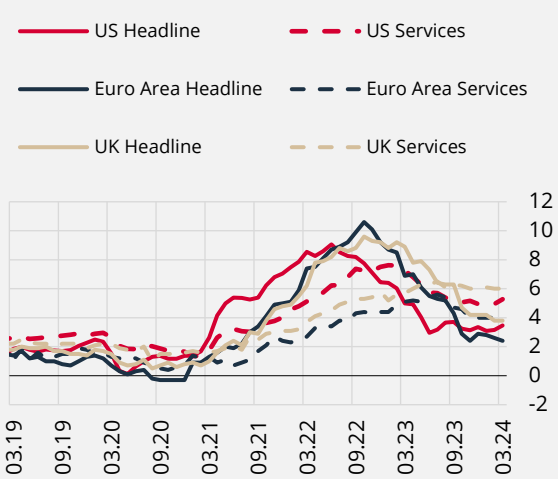
Box 2.4

Services Inflation Outlook

Goods and services groups, the two main components of core inflation, exhibit structural differences. Productivity, openness to foreign competition, sensitivity to credit and labor intensity are the main axes of these structural differences. On the other hand, the difference between the price-setting behavior of the sectors is also of great importance. Backward indexation is more widespread in the services sector, particularly in the rent subgroup. While time-dependent price setting is more prevalent in the services sector, some regulations reinforce this tendency. Prices are set once or twice a year for items such as education and health services and with the effect of regulations, especially in education services, prices are increased depending on past inflation. Setting wages with actual inflation to maintain the purchasing power of employees in periods when inflation is high is another factor that amplifies the importance of past inflation in services sector, which has higher labor intensity. Finally, administered price adjustments are also largely based on inflation realizations.

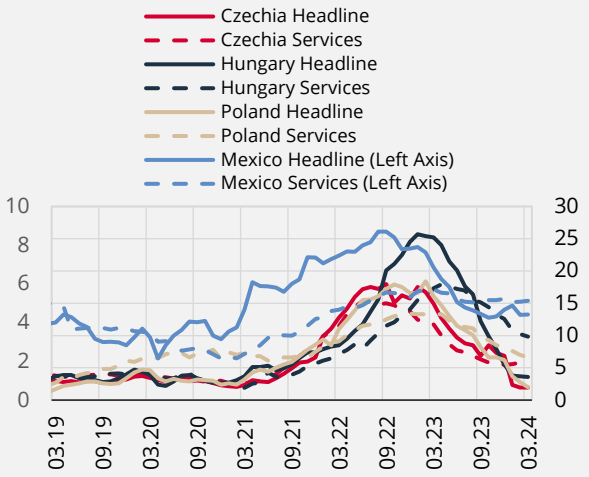
The effect of the price-setting behavior, which is dominant in the services sector, becomes more pronounced during disinflation periods, and sector dynamics stand out as the main factor slowing disinflation.[1] This is not unique to Türkiye, and it is observed in both advanced and emerging economies (Charts 1 and 2). The inertia in services sector inflation in recent months has hampered the disinflation process in some countries, particularly in the US, and led to a postponement of policy rate cut expectations.

Chart 1: Headline and Services Inflation Rates in Selected Advanced Economies
(Annual, %)



Source: OECD.

Chart 2: Headline and Services Inflation Rates in Selected Emerging Economies
(Annual, %)



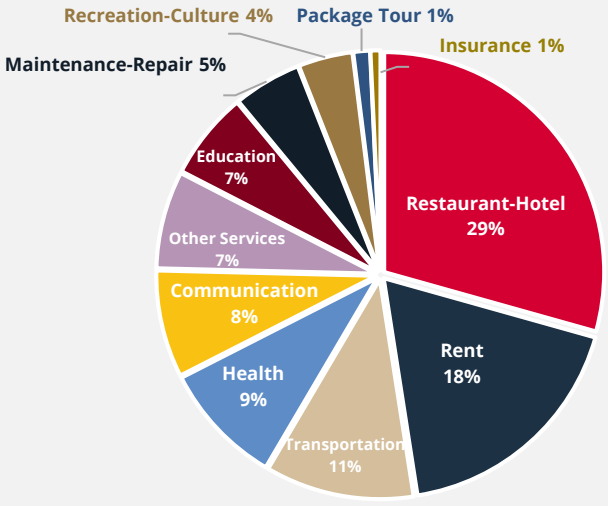
Source: OECD.

A Closer Look at Recent Developments

Not only does the services group have particular features that differentiate it from the other groups making up the consumer basket, but it also exhibits heterogeneity within itself. The first source of this heterogeneity is the weight structure. Within the services sector, certain subgroups have high weights. The restaurant-hotel subgroup, with a significant share of the catering services item, accounts for about one-third of the sector. The restaurants-hotels subgroup is followed by rent with 18% weight and transportation services with 11% weight. These three subgroups constitute more than half (58.5%) of the services sector (Chart 3).

[1] Amatyakul et al. (2024) argue that the relative price structure deteriorated with the increase in goods prices during the COVID pandemic, while services prices may be trying to catch up with the pre-pandemic relative price trend, implying that services inflation may therefore remain strong for a while.

Chart 3: Weights of Service Sector Subgroups in 2024 (%)



Source: TURKSTAT.

The second source of heterogeneity within the services sector is related to price-setting dynamics. While time-dependent price setting behavior is more prevalent in some subgroups, subgroups differ in terms of labor intensity, input use, indexation to past inflation and sensitivity to the exchange rate. When there is a sudden and significant rise in the price of an input that is key for a certain subgroup, the frequency with which firms review and change their prices may also increase. Restaurants-hotels and maintenance-repair stand out as the items that are most rapidly affected by wage developments, while food prices in restaurants-hotels and exchange rate developments in maintenance-repair play an important role. Although indexation to past inflation is common in rents, housing prices, minimum wage and inflation expectations also have an impact.[2] In education services, prices are set at a certain period of the year according to past inflation as required by regulations. In addition to fuel prices, wage developments may also play a role in transportation services prices. The fact that past inflation affects the services sector's price-setting behavior leads to inertia both directly and indirectly through wages. While this inertia restrains general price increases during periods of rising inflation, it has the opposite effect during disinflation periods and weakens the effectiveness of monetary policy.

As of April, while core goods inflation was 57.1%, services inflation stood at 97.0%, a difference of almost 40 percentage points. When subgroup developments are examined, traces of the heterogeneous structure within the sector can be observed. Rent (124.5%) and transportation services (100.8%) push the sector inflation upwards. While annual inflation in restaurants-hotels (95.8%) and other services (90.5%) is slightly below the services group inflation, annual inflation in communication services (66.3%) is well below the services group inflation. Within the other services subgroup, education services (103.9%), which is dominated by the private sector, come to the fore with high annual inflation.

In order to analyze the recent inflation dynamics of the service sector, the equation presented in Table 1 has been estimated. As explanatory variables, the lagged value of services inflation (inertia), basket exchange rate, output gap, food prices excluding fresh fruit and vegetables, fuel prices and net minimum wage as a proxy variable for wages were selected. Basket exchange rate, food prices excluding fresh fruits and vegetables, fuel prices and minimum wage variables were introduced into the model in quarterly percentage changes. In the first quarter of the year, to take into account the developments regarding services items with time-dependent price setting and high tendency for backward indexation as well as automatic tax adjustments and increases in administered prices, the "indexation" dummy variable was created corresponding to the annual consumer inflation values at

[2] Özmen and Yüksel Yücel (2017).

the end of each year (this variable is zero in the first, second and third quarters, corresponds to the year-end annual consumer inflation in the last quarters). The model has been estimated with ordinary least squares method at quarterly frequency for the period 2005Q4-2024Q1. Service sector prices are used after adjusting for VAT effects. The model also includes seasonal dummy variables and dummy variables for the third and fourth quarters of 2023.

Estimation results show that indexation behavior and minimum wage as well as inertia[3] are important determinants of services inflation (Table 1). Approximately 40% of past services inflation is carried forward to the next quarter. The coefficient estimate of the dummy variable, intended to capture the effect of indexation to headline inflation, indicates that approximately one-fifth of the annual headline inflation in the previous year was transferred to services inflation in the first quarter. On the other hand, model results confirm that services are also highly sensitive to wage arising from the labor-intensive structure of the sector. Considering the wage developments along with inertia and indexation behavior, a large part of the services group inflation in the first quarter of the year can be explained. Accordingly, the services sector is characterized by widespread inflation inertia due to the interaction of wages with actual inflation and strong backward-indexation mechanisms. In addition, food prices may affect catering services, and fuel prices may affect transportation services prices through the cost channel. Maintenance and repair services have a strong connection with exchange rate developments. Finally, services inflation is also affected by aggregate demand conditions, particularly domestic demand conditions.

Table 1: Service Sector Price Dynamics

Dependent Variable: Quarterly Percentage Change of Consumer Services Prices (Adjusted for VAT) (2005Q4 - 2024Q1)

	Constant Term	Services Prices	Indexation to Headline Inflation	Net Minimum Wage[a]	Food Prices Excluding Fresh Fruits and Vegetables	Output Gap	Basket	Fuel	Dummy 2023Q3	Dummy 2023Q4	R^2
Coefficient Estimation		(t-1)	(t-1)		(t)	(t)	(t)	(t)			
	-0.3	**0.42*** **	**0.21*** **	**0.11*** **	0.14***	0.05***	0.03***	0.02***	13.06***	-5.08***	0.98

*** corresponds to 1% significance levels.
a: average of lags between t and t-2.

In order to understand the change in the price dynamics of the service sector during the high inflation period, the model parameters were re-estimated recursively[4] (Charts 4-9).[5] The services inflation inertia, after remaining relatively flat from 2019 through 2021, increased in 2022Q1 and showed an upward trend afterwards (Chart 4). [6] There was a gradual increase in the headline inflation indexation coefficient. The indexation coefficient, which was not statistically significant at the beginning of the sample and displayed limited increases until the end of 2021, went up in line with the strengthening in annual headline inflation (Chart 5). These two factors cause the effects of demand and cost shocks to spread over a longer period of time in the service sector. In recent years, past inflation has played a greater role in wage adjustments and the minimum wage has been revised twice a year, bringing about an increase in the coefficient of the net minimum wage (Chart 6). While the cost-side effect of wage hikes is reflected to prices relatively more rapidly, the demand-side effect extends over time and harbors more uncertainties than cost-side effects. The output gap coefficient, which declined in line

[3] See CBRT (2023).
[4] In addition to recursive estimation, the rolling windows method was also tried for the change of the parameters over time, and the model coefficients were estimated using 48-quarter rolling windows. These estimates generally gave similar results to those of recursive estimations. The coefficients attained from the rolling window method revealed slightly higher estimates for basket exchange rate and food excluding fresh fruit and vegetables, and slightly lower estimates for minimum wage, output gap and fuel, compared to recursive estimates.
[5] Long-term values of time-varying coefficients are reported in the charts. For this purpose, inertia was taken into account, and the coefficient estimates were calculated by dividing by (1-inertia).
[6] Note that the indexing variable in the model reduces the inertia coefficient.

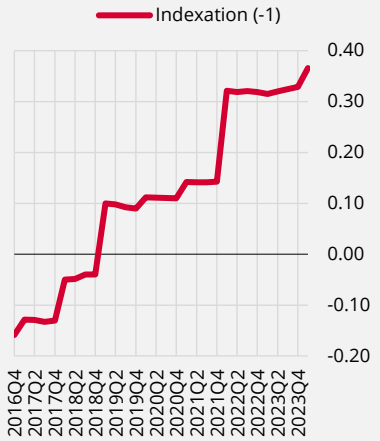
with the weakening in the demand for services during the COVID period, has been on a recovery trend with the exit from the pandemic (Chart 7). Although there are some items in the service sector whose prices are sensitive to exchange rates, such as transportation, maintenance and repair services and package tour, exchange rate pass-through is limited since the use of imported inputs is relatively low in the services sector (Chart 8).[7] However, the exchange rate effect tends to increase over time. The coefficient of food prices increased over time, reflecting the relative uptrend of food prices, and continued to make a high contribution by becoming flat after 2022 (Chart 9).

Table 2: Recursive Model Coefficient Estimates (Long Term)

Chart 4: Coefficient of Services Prices Inertia

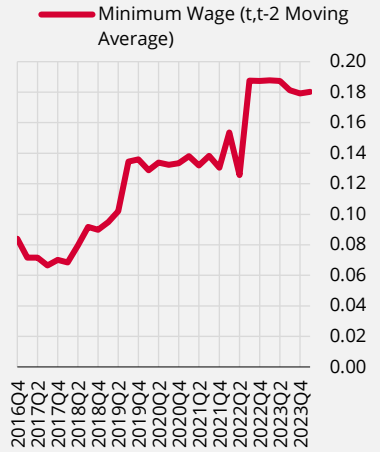
Source: CBRT.

Chart 5: Coefficient of Headline Inflation Indexation



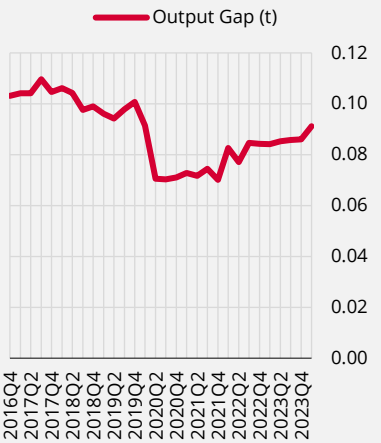
Source: CBRT.

Chart 6: Coefficient of Net Minimum Wage



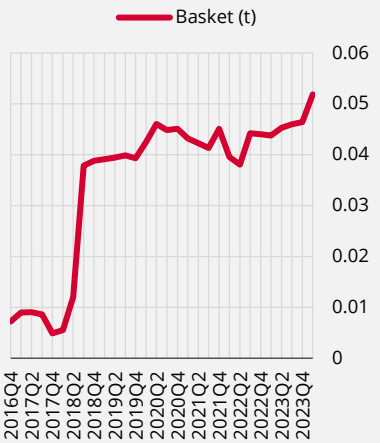
Source: CBRT.

Chart 7: Coefficient of Output Gap



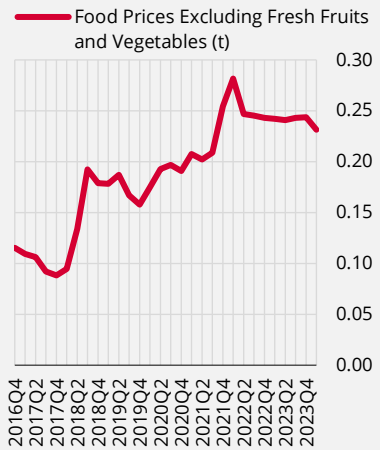
Source: CBRT.

Chart 8: Coefficient of Basket



Source: CBRT.

Chart 9: Coefficient of Food Excluding Fresh Fruits and Vegetables



Source: CBRT.

In sum, while the quarterly inflation in the services group is approximately 23.5% in the first three months of 2024, the effect due to inertia and indexation to headline inflation is estimated as 18.2 percentage points. Therefore, a significant part of the quarterly services inflation in the first quarter of 2024 can be explained by the backward-indexation effect. When the wage effect is considered in addition to these two factors, the impact of past inflation becomes even greater. In this respect, the increase in the share given to inflation expectations in price-setting behavior, and the convergence of

[7] Since the model includes variables affected by the exchange rate, such as fuel, food and headline inflation, some of the exchange rate effect is already included in the model through these variables. In this regard, caution is warranted when interpreting the exchange rate coefficient as an absolute magnitude.

these expectations to inflation targets is of great importance. To this end, the coordination between monetary and economic policies will continue to strengthen.

References

Amatyakul, P., Deniz, I. and Lombardi, M. J. (2024). Sectoral Price Dynamics in the Last Mile of Post-Covid-19 Disinflation. BIS Quarterly Review, Bank for International Settlements, March.

CBRT (2023). Persistence of Services Inflation. Inflation Report 2023-III, Box 2.3.

Özmen, M.U., Yüksel Yücel, C. (2017). Factors that Affect Rent Inflation in Turkey (in Turkish). CBT Research Notes in Economics No. 17/07.