Box 3.2

Coordination Between Monetary and Fiscal Policies: Sliding Scale Tariff and Its Impact on Inflation

The Sliding Scale Tariff (SST), introduced in May 2018, has established a ceiling on the prices of fuel oils, where the ceiling was determined to be then-effective prices of fuel oil products. The mechanism by which this application works is to make the necessary cut in fuel oil taxes whenever the underlying prices of fuel oil hit the ceiling, which might be due to exchange rates, oil prices or butane/propane prices shocks. This mechanism kept the fuel oil prices constant in a period when the volatility in financial markets was heightened and Turkish lira was depreciating. Thus, the likely inflationary pressures of a rise in fuel oil prices have been contained, which would otherwise have a large spillover effect on consumer prices. As per the implementation, the lump-sum SCT was raised in tandem with the appreciation of the Turkish lira and the fall in oil prices to keep fuel oil prices constant.[1] When cost factors allowed, taxes returned back to the pre-SST levels, allowing decreases in fuel oil. The fixed price implementation was effective until 4 December 2018 and following this, price reductions in consumer prices started to be observed.[2] This box explains the impact of SST on consumer inflation in the period May-December 2018 when SST was effective.

Measuring the impact of SST on consumer price inflation necessitates estimating the fuel oil prices in a scenario where SST was not implemented, thus demands an understanding of how prices for fuel oils are set. Fuel oil prices are set according to a formula determined by the EPDK (Energy Market Regulatory Authority) and the effective prices are updated when the discrepancy between the effective prices and the prices calculated according to the formula (formula price) exceeds a threshold. Since not all the components of the formula are perfectly known, the formula price, hence the prices that would be effective under a no-SST scenario are unknown. In this regard, fuel oil prices are modelled using main cost factors such as exchange rates and oil prices.

Considering the fuel oil products (gasoline, diesel fuel and LPG), exchange rates, oil and butane/propane prices are set as explanatory variables for the model. Due to the innate long run relationship between fuel oil prices and Turkish lira denominated oil and butane/propane prices, for estimation purposes under different scenarios (e.g. no SST scenario), the amount of deviation from the long-run equilibrium prior to the estimation period should be taken into account. This calls for a model that takes into account this relationship and incorporates an assumption for an error correction mechanism.

Against this backdrop, using the main determinants of fuel oil prices along with the lump sum tax on fuel oils, an autoregressive distributed lag (ARDL) model is estimated. The model is given as

[1] Prices of fuel oils went up in August due to a one-time hike in lump sum tax and in September due to the impact of the hike extended to September price data. Moreover, price increases, which actually stemmed from the adjustments by fuel stations, were observed in the other months as well, albeit these increases remained very limited.

[2] The impact of the SST on gasoline and diesel fuel faded in November. Hence, prices of gasoline and diesel fuel showed downward movements in November.

$$\Delta \log(P_t - \tau_t) = \alpha + \beta_1 \Delta \log(e_t) + \beta_2 \Delta \log(oil_t) + \beta_3 \Delta \log(bp_t) + \lambda[\log(P_{t-1} - \tau_{t-1}) - \gamma_1 \log(e_{t-1}) - \gamma_2 \log(oil_{t-1}) - \gamma_3 \log(bp_{t-1})] + \delta D0907$$

In the equation, log denotes the logarithmic transformation, P_t fuel oil prices, τ_t the lump sum tax on fuel oil products, e_t the USD/TL exchange rate, oil_t international oil price and, bp_t denotes weighted average of butane and propane prices. $D0907$ is a dummy variable for July 2007, and λ denotes the speed of adjustment to the long run equilibrium. The model is estimated by OLS, and the estimation results are shown in Table 1. The model is able to explain 90% of the variation in fuel oil prices, and the coefficients are consistent with the theory in hand, and are statistically significant.

Table 1: Model Output

Parameter	Coefficient	Standard Dev.	t-Statistic
α	-0.64	0.143	-4.52
β_1	0.78	0.059	13.15
β_2	0.43	0.023	18.54
β_3	0.20	0.021	9.83
λ	-0.18	0.040	-4.64
γ_1	0.97	0.033	29.1
γ_2	0.61	0.081	7.53
γ_3	0.13	0.079	1.65
δ	-0.14	0.021	-6.89
Sample	January 2007 – April 2018 (Monthly)		
R^2	0.89		

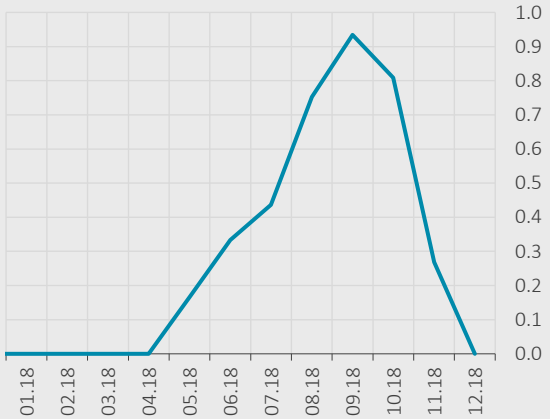
Source: Author's Own Calculations.

Fuel oil prices implied by the model results and the actual prices under SST are depicted in Chart 1. The discrepancy between the actual and the estimated fuel oil prices reached the peak in September.

Chart 1: Actual and Estimated Fuel Oil Prices (TL)

Source: Author's Own Calculations.

Chart 2: Impact on CPI Inflation in an Alternative No SST Scenario (% Points)



Source: Author's Own Calculations.

The estimated impact of fuel oil prices under a no SST scenario on CPI inflation is provided in Chart 2. By September, around 1 percentage point of contribution to CPI inflation had been prevented. Taking into account the fact that fuel oils constitute one of the most widely used inputs in the economy, and considering the expectations and price indexation channels, a significant inflationary pressure has been contained by SST. After September, particularly in November and December, the fall in international oil prices along with the appreciation of the Turkish lira has rendered SST ineffective. Therefore, SST has smoothed the sharp increase in inflation in the third quarter and helped containing the inflationary pressures, direct and indirect, and demonstrated a significant example of macroeconomic policy coordination.